Ontario

Ministry of Transportation Northeastern Region

Gravenhurst Patrol Yard
Detail Design Study

WP 5420-02-00

HYDROGEOLOGICAL INVESTIGATION AND DESIGN FINAL REPORT

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ecoplans Limited

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1.0 INTRODUCTION

McCormick Rankin Corporation (MRC) and Ecoplans Limited (Ecoplans) have been retained by the Ministry of Transportation - Northeastern Region (MTO) to carry out a Hydrogeological Investigation and Design Study (Study) at the proposed new Gravenhurst Patrol Yard (Site). The site is located on the east side of Highway 11 just south of Muskoka Road 169 and is to the east of the existing Gravenhurst Patrol Yard.

As per the Terms of Reference (ToR) for this project, this report is organized in three (3) main sections:

- Introduction, Site Description, Background Information Review, Site Inspection, and Water Well Testing (Sections 1 to 5) are general introductory sections to document the purpose of this study, scope of work, site description, detailed background information review, site inspection, and the water well testing program;
- Hydrogeological Investigation Section (Sections 6 and 7) presents and discusses the methodology and results of the subsurface investigation undertaken at the site; and
- Hydrogeological Design Section (Sections 8 to 10) discusses the site susceptibility to patrol yard impacts, presents recommendations for the planning, design, and an operational activity associated with the proposed site, and presents a comprehensive monitoring program for the site.

1.1 Purpose of Study

The purpose of the study is to define the geology and hydrogeology of the site in order to determine the most suitable mitigation measures to minimize the potential for groundwater and surface water impacts resulting from the future patrol yard operations. The specific objectives of the study are to:

- Define the local groundwater regime and potential contaminant plume migration pathways;
- Determine the physical, hydraulic and chemical properties of the soil and bedrock;
- Establish a short and long term groundwater and surface water monitoring network; and
- Provide feasible groundwater mitigation/remedial options and contingency plans to effectively manage any salt losses or other contaminants into groundwater.

1.2 Scope of Study

The general scope of work included:

- Undertaking a site inspection to document and evaluate existing surface topography, and surface and subsurface hydrology;

- Reviewing all available background information for the site including the recently completed Preliminary Hydrogeological Site Screening, and the Preliminary Hydrogeological Investigation and Design Reports;
- Carrying out a water well testing program of all water wells within 500 meters of the site;
- Completing boreholes and monitoring wells across the site to characterize soil and/or bedrock conditions;
- Measuring groundwater levels and pressure heads to define groundwater flow characteristics at all existing and recently installed monitoring wells;
- Collecting selected soil and groundwater samples to characterize soil and groundwater quality, respectively;
- Undertaking Single Well Response Tests (SWRTs) and a long term pumping and recovery test to characterize the aquifers' hydraulic properties;
- Interpreting all collected field and analytical data; determining the groundwater flow system at the site and contaminant attenuation capabilities; and identifying any unstable soils or geological conditions;
- Designing the most feasible groundwater mitigation options that are to be coordinated with the overall detailed design of the proposed patrol yard facility; and
- Presenting a comprehensive long term groundwater and surface water monitoring program at the Site to effectively monitor and predict potential environmental impacts as a result of the site's operation.

2.0 SITE DESCRIPTION

The site is located approximately 300 metres southeast of the Highway 11 and Highway 169 Interchange. It is situated between the existing MTO Patrol Yard and Jevins Lake. Figure 1 shows the site location.

The estimated total area of the site is 5.1 hectares. Figure 2 shows the approximate site limits, approximate footprint of operations area, and significant site features. Site photographs have been included in Appendix A. These features are described below:

- the site is surrounded to the north, east and west by bedrock ridges with the most prominent flanking the north side which precipitates sharply to the north into Jevins Lake;
- between the ridges, the site slopes to the southeast;
- a small rectangular pond (referred to as the "small pond") exists at the southeast corner of the site;
- southeast portion of the site is flanked by a wetland (referred to as the "large wetland");
- south central portion of the site slopes to the southeast towards the wetland;
- the site is predominantly forested with the exception of small open pockets on bedrock outcrops; and
- a small number of access roads/trails meander through the site.

3.0 BACKGROUND INFORMATION REVIEW

Ecoplans completed a background information review for the site. The purpose of the review was to gain a general understanding of the regional and local geology and hydrogeology of the area. Ecoplans reviewed existing geological maps, current and historical aerial photographs, and water well records. In addition, previous reports completed by Ecoplans for the Site Selection and Class Environmental Assessment Study for this site have also been reviewed and are summarized in this section.

3.1 Geology

3.1.1 Overburden Geology

According to the Aggregate Resources Inventory of the Towns of Bracebridge and Gravenhurst (Ontario Geological Survey Aggregate Resources Inventory Paper 147 – 1990) and Open File Map 195 Quaternary Geology of the Gravenhurst Area (Ontario Geological Survey - 1992), the Gravenhurst area is characterized by glacial and postglacial deposits of gravel, sand, silt and clay and swamp and organic deposits of peat and muck overlying Precambrian bedrock. The surficial geology of the site under study is composed of glaciolacustrine deposits of fine sands and silts.

3.1.2 Bedrock Geology

The bedrock in the area exhibits the typical “rock knob” and “rock ridge” topography of the Canadian Shield. The area is separated into two distinctive physiographic regions influenced by the bedrock geology. The area to the north and east of Gravenhurst is dominated by bedrock outcrops (“rock knob” topography) with pockets of glaciolacustrine deposits of fine to very fine sand with some gravel and silt. The area to the south and west is dominated by northwest-southeast trending bedrock ridges (“rock ridge” topography) either exposed or covered by a thin veneer of soil. The valleys between the ridges are filled with glacial outwash deposits of well-stratified and uniformly bedded sand; and/or glaciolacustrine deposits of fine to very fine sand with some gravel and silt. The bedrock geology is composed of ultramafic anorthosite, diorite and gabbro suites with gneissic and schistic textures.

3.2 Hydrogeology

Preamble

Groundwater is found in water bearing zones below the ground. Less permeable or impermeable layers called aquitards may separate these water bearing zones or aquifers. The aquitards restrict groundwater movement typically between the shallow groundwater zone and the deeper groundwater zone. The shallow groundwater zone is usually perched, unconfined (i.e. not under hydrostatic pressure), limited in areal extent, and generally reflects the surface topography. On the other hand, the deeper groundwater zone is usually at depth, confined (i.e. under hydrostatic pressure/artesian conditions), regional in extent, and does not generally reflect the surface topography. The regional

aquifer, or groundwater system, is usually the potable water supply source for human and agricultural consumption.

Site and Surrounding Area

The hydrogeology of the Gravenhurst area is characterized by shallow local and regional aquifers in the glacial sands and gravels; and a deep regional aquifer in the bedrock.

The shallow aquifers are generally unconfined (i.e. not under hydrostatic pressure) and are influenced by the bedrock topography with the most regionally extensive aquifers in the bedrock valleys or any other topographic lows where the glacial deposits are thickest. The top of the aquifer (i.e. water table) is usually very shallow (usually up to surface) and likely extends down to bedrock. The shallow aquifer system across the study area is

hydraulically connected to the surface water courses; discharging as baseflow into the streams, lakes and wetlands. The aquifers may also be recharged from surface water courses during dry periods (late in the summer/fall).

The regionally extensive aquifer in the area is in the bedrock and is the principle source of drinking water to households and businesses not presently municipally serviced. The bedrock aquifer is confined (under hydrostatic pressure) with groundwater being stored and transmitted through bedrock fractures (secondary permeability).

3.3 Water Well Records

Preamble

The Ministry of the Environment's Water Well Database is a compilation of water wells drilled in the Province of Ontario for the purpose of human, agricultural and industrial consumption. Pursuant to the Ontario Water Resources Act, any well drilled for these purposes must be drilled by an MOE licensed well drilling contractor and documented on a Water Well Record. The record is then filed with the MOE. Examples of data recorded on a water well record include: location of well, date drilled, depth to water, static water level and subsurface stratigraphy. Since well records have been completed by many different drillers during the past 50 or so years, data accuracy and consistency is sometimes questionable. The most important data recorded on a record are the depth of the water supply aquifer and the subsurface stratigraphy. This information helps in determining whether the aquifer is hydraulically connected to the surface hydrology of an area through groundwater recharge and discharge. It is also important to realize that water wells are drilled into aquifers that can yield appreciable quantities of water for their intended purpose. The majority of these aquifers are normally found at depth in the deep groundwater zones. Therefore, shallow perched aquifers are rarely exploited as a resource due to high susceptibility to contamination, low yields, and potential impacts to surface water baseflow. Water well records seldom identify shallow perched aquifers.

However, given their limitations, water well records still provide a very useful source of both local and regional geology and hydrogeology.

Site and Surrounding Area

Ecoplans completed a water well record search of an area within 500 meters of the site. The results of the search identified one (1) water well record for one (1) well located in close proximity to the study limits. The well is located southwest of the site and services the existing MTO patrol yard. The well is terminated in sand overburden at a depth of 19 metres. No records were found for the site or the five (5) residences to the immediate west of the site.

3.4 Aerial Photographs

Current and historical aerial photographs for the site and surrounding area were previously reviewed by Ecoplans (as documented in the Gravenhurst Patrol Yard Site Selection and Class EA Hydrogeological Investigation Report) to identify any surface features that are of potential hydrogeological significance (surface water bodies, vegetation cover and human development impacts).

The most significant observation noted on the aerial photos was that sometime between 1978 and 2002, the forest was thinned by selective logging and the large wetland appeared. It is likely that selective logging in the past resulted in the formation of the wetland. This could have been caused by the increase in surface run-off and soil infiltration with the net effect being water storage in the topographically low wetland area.

3.5 Review of Previous Hydrogeological Reports

Ecoplans reviewed the "Hydrogeological Investigation Report" completed by Ecoplans during the Site Selection and Class EA study for the site (February 2005). The following is a summary of the significant findings of the report:

- Site geology consists of native sand deposits overlying Precambrian bedrock. The sand depths ranges from 1.8 m to as deep as 16.5 m;
- General hydrogeology is characterized by a shallow unconfined aquifer overlying a fractured bedrock aquifer, both of which are connected to surface water courses;
- Water well survey identified seven (7) wells within 500 m of the site, all of which will be decommissioned to accommodate the proposed Highway 11/69 interchange re-alignment;
- The shallow groundwater flows to the southeast toward the wetland and are both hydraulically connected;
- No visual of olfactory evidence of contamination was observed; and
- All analytical samples submitted for soil and groundwater were below the applicable MOE standards with the exception of total petroleum hydrocarbons are one (1) monitoring location

(MW2); aluminum, iron, manganese, total hardness and pH are various other monitoring locations, all of which are considered as aesthetic objectives and are not health-related.

Ecoplans also reviewed the "Hydrogeological Design Report" completed by Ecoplans during the Site Selection Class EA study for the site (February 2005). The following is a summary of the report recommendations:

- Establish a groundwater monitoring network;
- Undertake an ongoing groundwater and surface water quality monitoring program;
- Undertake an Ecological study at the wetland to the southeast of the site, which the ultimate receptor of concern; and
- Undertaken a water quality monitoring program from the oil/water separator and holding tanks (if applicable).

4.0 SITE INSPECTION

The purpose of the site inspection is to observe and document any significant features of hydrogeological concern such as surface water courses, seepage zones and springs (groundwater discharge), topography and surficial geology. During the course of the study, a number of site inspections were completed. Figure 2 And Appendix A (site photographs) show some of the features identified during the site inspections. The results of the site inspections are summarized below.

- the site contains many areas of shallow bedrock outcrops, including a few large bedrock ridges and knolls;
- the two existing water bodies, the small pond and large wetland, appear to be hydraulically connected to the shallow groundwater aquifer in the area. Both water bodies appears to fluctuate seasonally with the groundwater, however the small pond appears to be intermittent – this is due to the shallow water table which is generally at the same elevation as the bottom of the pond
- the small pond may have been used as a small borrow pit;
- a few small depressions are scattered across the site and at the time of the site inspections were noted to be full of water likely indicating shallow groundwater conditions;
- surficial geology is predominantly sand and gravel overburden with scattered boulders most notably at the southwest portion of the site;
- miscellaneous garbage and debris were scattered throughout the northeast portion of the site;
- a small network of access roads/trails meander through the site;
- no seepage zones or springs were noted; and
- immediately to the west of the site (north of the Patrol Yard), the area appears to have been excavated as a possible large borrow pit, and some miscellaneous garbage and debris were noted.

5.0 WATER WELL TESTING PROGRAM

As per the Terms of Reference, Ecoplans was to include a water well testing program of all water wells within 500 m of the site. As documented in Section 3.3. of this report, only one (1) water well record was found based on a search of the MOE water well Database. This record was for the water well servicing the existing MTO patrol yard to the west of the site. There are, however, five (5) water wells servicing five (5) residences to the west of the site along Holmes Road. No records were found for these wells.

The MTO well is a drilled well, which was installed to a depth of 19 m below ground surface (bgs). Based on a previous water well survey conducted by Ecoplans in 2005, the five (5) Holmes Road water wells are all shallow dug wells varying in depth from 6.6 m to 10 m. Since all of these wells will be decommissioned to accommodate the proposed re-construction of Highway 11/69 interchange, no water well testing of these wells were carried out.

A. HYDROGEOLOGICAL INVESTIGATION

This section presents factual information detailing the methodology and results of the subsurface investigation completed during this study.

6.0 SUBSURFACE INVESTIGATION

Ecoplans carried out a subsurface investigation at the site to provide a general physical and chemical assessment of the soil and groundwater conditions across the site. The investigation included the drilling of boreholes, installation of groundwater monitoring wells, and aquifer hydraulic testing.

The monitoring wells were spatially distributed to provide a good characterization of the geology and hydrogeology of the site. All bedrock wells (refer to Section 6.1) were placed around the outside perimeter of the proposed patrol yard facility to be used a long-term groundwater monitoring wells. Figure 3 shows the approximate footprint of the operations area of the proposed patrol yard facility, and the location of the monitoring well nests installed in 2006. Figure 3 also presents the locations of the eight (8) overburden monitoring wells installed by Ecoplans in May 2004.

All fieldwork was carried out with due regard to generally accepted environmental field protocols and in general accordance with applicable Ontario Ministry of the Environment (MOE) and Canadian Standards Association (CSA) guidelines.

6.1 Drilling Program

Under direct supervision of Ecoplans' field personnel, the drilling work was completed by professionally trained and reputable drilling companies. Marathon Drilling Co. Ltd. of Gloucester, Ontario was retained to conduct the drilling and installation of overburden monitoring and bedrock wells. Strata Soil Sampling Inc. of Richmond Hill, Ontario undertook the drilling for discrete soil samples submitted for laboratory chemical analysis.

A total of nine (9) boreholes were drilled at the locations shown on Figure 3. All of the boreholes are located in topographically flat areas and along cleared roads and trails to permit relatively easy drill rig access. Table 1 summarizes the monitoring well details.

6.1.1 Overburden Drilling

The overburden boreholes were advanced using a track-mounted drilling rig equipped with hollow stem augers. The augers were extended to the pre-determined sampling interval using conventional drilling methods, removed, and then a decontaminated split spoon sampler was driven to the depth of the borehole to collect a discrete soil sample.

6.1.2 Bedrock Drilling

The same method as described above was used to drill the overburden section of the boreholes. When the drilling could not advance due to sand heaving, no soil samples were collected. The drilling of 0.11 m (4 inches) casing with clean water flushing was conducted down through a few feet into the bedrock. NQ size of 0.08 m (2.98 inch) diameter diamond bit rock drilling was used to advance the boreholes into the bedrock, and clean water was used to remove cuttings and lubricate the diamond bit during drilling.

6.2 Soil Sampling Program

In an effort to establish the existing chemical and physical conditions of the soil across the site, a number of soil samples were collected and submitted for chemical analysis to AGAT Laboratories Ltd. (AGAT), a full service analytical laboratory certified by the Canadian Association of Environmental Analytical Laboratories for chemical analyses. A number of soil samples were also collected and submitted for physical analysis (moisture content and grain size analysis) to Thurber Engineering Ltd. (Thurber). The detailed analytical packages are shown on Table 2 included at the end of the report.

Representative soil samples were collected from the overburden boreholes using a 0.6 m (2 ft) split-spoon sampler, which was driven by use of a 63.5 kg (140 lb) hammer. The number of blows applied per each 0.15 m (6 inches) was recorded. Split-spoon soil samples were generally collected at 0.75 m (2.5 foot) intervals and were either composited over the 0.6 m (2 ft) spoon, or were composited to represent each different geological unit encountered.

It should be noted that three (3) soil samples from selected boreholes exceeded their laboratory holding time. Ecoplans returned to the site on February 27 and 28, 2006 with Strata Drilling Inc. to re-drill three (3) boreholes using a portable drilling rig (pionjar) to collect representative soil samples from the same locations and depths of the original sampled locations. EBH12 to EBH14 are the replacement sampled boreholes to EMW12 to EMW14. Due to similar lithology and characteristics, data from the EBH boreholes series is not presented in this report. Soil samples collected for chemical analysis were advanced using a track-mounted drilling rig equipped with a direct push Geoprobe. The probe was extended to the pre-determined sampling interval using direct push methods, at which time a decontaminated dual-tube lined sampler was driven through the subsurface to collect a discrete soil sample. Representative soil samples were collected from the boreholes using a 1.2 m (4ft) dual-tube lined sampler, which was driven by use of the Geoprobe. Dual-tube liner soil samples were generally collected at 1.2 m (4 ft) intervals and were either composited over a 1.2 m liner, or were composited to represent each different geological unit encountered (using the below naming conventions). The borehole that could not be accessed by the Geoprobe was advanced using a gas powered portable Pionjar. A decontaminated, 0.76 m (2.5 ft) split spoon was driven to the depth of the borehole to collect a discrete soil sample.

All soil samples were named and labeled indicating the borehole number followed by the sample interval number. A total of six (6) soil samples were collected and submitted to AGAT for chemical

analyses. All soil samples were inspected for the presence of gross impact (i.e. odours and/or staining), and logged for colour, texture and consistency before being placed in Ziploc bags and sample jars. Soil samples were logged in general accordance with the Unified Soil Classification System (USCS). Table 2 presents the soil sampling locations and analytical schedule provided at the end of this report

A total of nine (9) soil samples were submitted for physical analyses (grain size analysis and moisture content) to the laboratory during the subsurface investigation. The grain size analyses were undertaken using either sieve analysis (coarse) or hydrometer analysis (fine) depending on actual sample grain size.

6.2.1 Soil Sample Screening

All soil samples were screened in the field for the presence of total organic vapors (TOVs) using a MiniRae photoionization detector (PID) calibrated to isobutylene. Headspace techniques were employed to screen the soil samples. Soil samples were placed in Ziploc bags (partially filled) and allowed to equilibrate with indoor ambient air conditions (approximately two hours) to ensure that all samples were screened under the same conditions. Following calibration, TOV measurements of the headspace within the Ziploc bag were collected. The PID was zeroed and field calibrated to isobutylene prior to each day's use. All TOV readings were measured below 1ppm and are provided in the boreholes logs found in Appendix B.

6.2.2 Soil Sample Collection and Transfer

All soil samples were collected using clean disposable latex gloves to ensure reliable and representative sample collection. Samples were placed in appropriate sampling jars for laboratory analysis. The samples were then placed immediately into an insulated cooler complete with ice and/or freezer packs. Field chain-of-custody records completed at the time of sample collection, accompanied the samples inside the cooler for delivery to the laboratory. All coolers were couriered to the analytical laboratory to ensure proper holding and turnaround times.

6.2.3 Decontamination

All equipment in contact with soil samples was decontaminated after each use to prevent the cross-contamination of individual samples and to ensure reliable, representative, and unbiased chemical test results. Decontamination of sampling equipment was typically achieved using tap water/lab detergent wash, followed by clean water rinse, methyl hydrate rinse, and deionized water rinse.

6.3 Rock Coring Program

Rock cores collected form all three (3) bedrock boreholes and were logged for rock type/mineralogy, presence of fissures and fractures and water bearing zones. Rock cores were collected in 1.5 m (5 ft) sections, logged, and preserved in dedicated core-boxes with proper labeling of well name and depth interval. All relevant bedrock logging information is presented in the borehole logs found in Appendix B.

6.4 Monitoring Well Installations

A total of eight (8) monitoring wells were installed at the site. Scaled diagrams of the monitoring wells installed are included in the borehole logs provided in Appendix B.

6.4.1 Well Construction

The overburden monitoring wells were constructed from 50mm diameter, schedule 40 polyvinyl chloride (PVC) flush-joint threaded pipe. The well screens were comprised of factory slotted (slot width of 0.0254 cm) PVC pipe to readily allow the entry of groundwater into the well. The bottoms of the screens were plugged with slip-on end caps. The appropriate numbers of risers were coupled with the screen sections via threaded joints to construct the well.

All wells were positioned at the bottom of the boreholes to ensure long-term stability. Following well placement, medium-size silica sand was added to fill the annular space created between the outside of the well and the inside of the boring. Sand was added until the level of sand reached a minimum of 0.3 m and maximum of a 1.0 m above the top of the screened interval. The final level of the sand pack was plumbed with a weighted tape and recorded.

A water level measurement was then taken in the annulus of the borehole to confirm the presence/absence of water above the sand pack. Coarse ground bentonite and/or bentonite pellets 1 cm in diameter were then poured down the borehole to produce a seal with a minimum thickness of 0.60 m. The bentonite was hydrated if required. The bentonite depth was verified using a weighted measuring tape and recorded. The bentonite provides stability to the well installation and also acts as a seal to prevent surface runoff or aquifer cross-contamination from entering the well.

The bedrock monitoring wells were constructed using a 0.11 m (4 inch) diameter steel casing that was advanced through the overburden to approximately 0.3 m (1 ft) into the bedrock. The casing was secured in the overburden using bentonite. The borehole from the overburden/bedrock interface to the well bottom was left open.

No PVC cement or any chemical or solvent was used during the construction of the wells. All monitoring wells were capped using lockable J-plugs and high-density steel weather resistant locks. Based on the surrounding environment, all wells were equipped with above ground 4”x 5’ lockable protective steel casing. The top 0.3 m of the well bore (above the bentonite seal) was filled with cold-patch cement to ensure stability to both the well and protective casing.

6.4.2 Well Development

The water levels were measured in all wells a few hours following installation. If water was present in the well, the well was ‘developed’ by pumping. The objectives of well development are to pump any non-representative groundwater introduced during drilling activities so that the natural hydraulic properties of the water-bearing formation are restored; and to create agitation in the groundwater in

order to remove particulate matter from the well, thereby collecting a groundwater sample that is representative of natural groundwater. Well development was continued until the water was free from suspended particulates or until it was impractical to continue due to low water yields.

Well development was achieved by continuous pumping, using either a dedicated inertial lift WaTerra pump for overburden wells or a submersible gas powered pump for bedrock wells. Well development was continued until 10 casing volumes of water were removed. The total volume of purge water pumped from the well was measured based upon the pump's flow rate. The flow rate was determined by measuring the time required for the pump at a specified power level to fill a 20 L bucket.

6.5 Groundwater Level Monitoring Program

A groundwater monitoring program was carried out by Ecoplans across the site. Groundwater levels and well depths were measured at 2 monitoring events: February 27 and May 9, 2006. The groundwater level monitoring program consisted of measuring the water levels of the seventeen (17) monitoring wells, eight (8) monitoring wells from the initial hydrogeological investigation completed in February 2005 and nine (9) monitoring wells completed as par of this study, to monitor the potentiometric surface of the local aquifer(s) to determine horizontal and vertical hydraulic gradients and groundwater flow direction during low (February) and high (May) flow seasons. The measuring devices were decontaminated between monitoring locations using a methyl hydrate rinse followed by de-ionized water rinse.

6.6 Groundwater Quality Monitoring Program

Prior to groundwater sample collection, each monitoring well was purged of the standing volume of stagnant water, which is not representative of the formation groundwater. The objective of purging was to pump the wells until water representative of the formation groundwater was obtained.

The overburden wells were purged by pumping a total of three full casing volumes of water from the well using an inertial lift WaTerra pump dedicated to the well. Attempts were made to pump the water from the top of the standing water column so that the entire static volume was removed. The total volume of purge water pumped from the well was measured using a graduated bucket and recorded. If the well was pumped dry during purging, it was allowed to fully recover before subsequent sampling.

The bedrock wells were purged by pumping a total of six full casing volumes of water from the wells using a gas powered submersible pump. The water was pumped from the top of the standing water column so that the entire static volume was removed. The total volume of purge water pumped from the well was measured based upon the pump's flow rate. The flow rate was determined by measuring the time required for the pump at a specified power level to fill a 20 L bucket.

Prior to sampling, clean plastic sheeting was placed on the ground surface adjacent to the well being sampled, which was used for storage of equipment and supplies. Clean disposable latex gloves were used throughout the sampling process to ensure reliable and representative sample collection.

Following collection, all groundwater samples were placed immediately into an insulated cooler complete with ice and/or freezer packs. Field chain-of-custody records completed at the time of sample collection, accompanied the samples inside the cooler for delivery to the laboratory. All coolers were couriered or hand delivered to the analytical laboratory within 24 hours of sampling time.

All equipment in contact with groundwater samples was either discarded or otherwise decontaminated after each use to prevent the cross-contamination of the monitoring wells and to ensure reliable, representative, and unbiased chemical test results. Decontamination of groundwater sampling equipment was typically achieved using methyl hydrate rinse followed by deionized water rinse.

6.7 Quality Assurance/Quality Control Program

AGAT completed a variety of quality assurance/quality control (QA/QC) measures on the soil and groundwater samples submitted as part of the sampling program. These included: sample replicates, which are identical analysis carried out on the same sample multiple times used to measure laboratory analytical precision; matrix spiked laboratory blanks, which are solvent or reagent blanks spiked with the analytes of interest used to measure and detect any analytical method errors; and process blanks, which are matrices without the analytes of interest that are carried through all steps of the analytical procedure used to measure contamination when stirring, blending, digesting, or sub-sampling and to prepare sampling prior to analysis. The results of the laboratory QA/QC program for this project are included in the laboratory Certificates of Analysis, presented in Appendix D.

The procedures used by the laboratory for each of the analytical packages (both soil and groundwater) were in accordance with industry-accepted laboratory protocols and the MOE Standards. The specific procedures used by AGAT for each analysis are documented in the laboratory Certificates of Analysis, included in Appendix D.

In addition to the laboratory QA/QC, Ecoplans submitted one (1) groundwater field duplicate during the groundwater sampling event, which took place on February 28, 2006. A soil field duplicate was also submitted during the soil sampling event on February 27, 2006. The results of the duplicate analysis are shown in the respective analytical tables. Most of the parameters analysed in the field duplicate were observed to be within acceptable limits of variance (<10%). Parameters with large variances between the duplicate and actual sample are considered to be estimates only and are to be interpreted with caution for the site.

6.8 Single Well Response Tests

Single well response tests (SWRTs) were completed at two (2) monitoring wells (EMW12 and EMW14) to estimate the hydraulic conductivity of the overburden water-bearing formation. The hydraulic conductivity of the formation is proportional to the rate of recovery of the well. EMW13 was dry at the time of this study. At the beginning of the SWRT, the static water level and the depth to the bottom of the well was measured using a Solinst interface probe. The well was then purged until

the water level was at or near the bottom of the well (dry) using the well's dedicated inertial lift WaTerra pump. The water level was then measured at time 0 and allowed to recover. The water level was measured every 10 seconds for a period of five minutes, after which water level measurements were conducted every 30 seconds for 10 minutes and then every 60 seconds for 15 minutes or until the groundwater reached the original static level or until it reached a steady state. Once complete, the data was analyzed using the appropriate analytical methods (e.g. Hvorslev method, Rice-Bower method, etc.) based on the known well geometry. The tabular and graphical results of the SWRTs are provided in Appendix C.

6.9 Long Term Pumping and Recovery Test

A pumping test was undertaken at the bedrock monitoring well (EBW14) to obtain information on the hydraulic properties of the bedrock formation underlying the site. An application for a Permit to Take Water (PTTW) from the Ministry of Environment (MOE) for the temporary taking of water during the pumping test was not needed based on the proposed pumping rate and duration (i.e. <50,000 L/day).

A step-drawdown test at EBW14 was completed on March 6, 2006 to determine the optimal pumping rate. Step-drawdown tests involve pumping a well at various pumping rates (if possible) while measuring drawdown and recovery rates within the test well and surrounding monitoring wells. Pumping rates ranged from approximately 3 to 5 L/min. Based on the minimal drawdown observed during the step drawdown test, a pumping rate of approximately 12 L/min was decided for the long term pumping test.

Following the step-drawdown test, a continuous-rate pumping test was completed on March 7, 2006. Water levels were recorded at the pumping well (EBW14) and at the nearby overburden monitoring well (EMW14). The pumping test was undertaken for approximately 11 hours at constant rate of 11.6 L/min, until quasi-stabilization of water levels had occurred.

Subsequent to termination of the continuous pumping rate test, water levels were collected during recovery to confirm the hydraulic parameter values determined from the drawdown data. In addition to manual readings, an electronic levelogger was used during pumping and recovery to allow for a more comprehensive data collection frequency.

The data from the pumping tests was analyzed using appropriate analytical methods (e.g. Theis, Cooper-Jacob, etc.) using computer software such as AquiferTEST^{TM}. A summary of the pumping and recovery test results are presented in Appendix C.

It should be noted that the pump during the pumping test had to be shutdown for a few minutes at two (2) occasions for re-fueling. The change in water level is shown on the drawdown hydrograph in Appendix C; however, the pumping overall trend is not impacted. During recovery, the pump was also turned on for sampling purposes without impacting the overall recovery trend as shown in Appendix C.

7.0 RESULTS OF SUBSURFACE INVESTIGATION

7.1 Site Geology

Based on the observations and interpretation of the samples collected from the boreholes during the investigation, the site geology generally consists of native sand deposits (fine to medium-grained) with various components of silt and gravel overlying fractured bedrock. These deposits are likely associated with glaciolacustrine deposits (predominantly consisting of sand) which are known to be deposited in the Gravenhurst area. The sand overburden depths varied significantly across the site varying from non-existent in the northern part of the site to as deep as 17.1 metres at EBW14 in the southeast part of the site. Wet soil conditions were encountered between 0.6 to 1.8 metres bgs in all Ecoplans boreholes. Figures 7 and 8 display cross-sectional diagrams of the geological (hydrostratigraphic) conditions encountered at the site based on the borehole logs. The cross-section indicates high variability of bedrock depth on-site with a general trend of increasing overburden thickness towards the east.

7.2 Site Hydrogeology

A total of seventeen (17) monitoring wells have been installed on-site to capture the shallow unconfined aquifer and the deeper bedrock aquifer. Monitoring wells EMW1 to EMW14 were installed to capture the observed shallow unconfined aquifer at the site. Monitoring wells EBW12 to EBW14 were installed to capture the observed deeper fractured bedrock aquifer at the site. All monitoring wells at the site were surveyed for ground surface, top of riser elevations, and water level elevations. Table 1 summarizes the monitoring well details for the site and Table 3 summarizes the relative groundwater elevations for each monitoring well at the site.

Based on the observations noted during the drilling program, each borehole encountered saturated soil conditions at very shallow depths, generally at depths of 1.5 m bgs. These conditions were generally observed through the full depth of each borehole down to bedrock. This shallow groundwater system represents a shallow unconfined aquifer storing a significant quantity of groundwater in the predominantly sandy matrix.

The bedrock aquifer is controlled by secondary permeability i.e. fractures and fissures. The presence of fissures and fractures zones were noted at various depths, as shallow as 6m bgs at EBW12 to as deep as 60m bgs at EBW14. The orientation, aperture, and density of fractures dictate the potential yield from the bedrock aquifer. As such, hydraulic testing results from the bedrock aquifers should be treated with caution due to the significant heterogeneity based on secondary permeability.

7.2.1 Groundwater Flow and Gradients

Based on the observations noted during the drilling and monitoring program, the shallow overburden groundwater system represents an unconfined aquifer, limited by thickness, storing a potentially significant quantity of groundwater in the predominantly sandy matrix.

The shallow groundwater system is hydraulically connected to the large wetland discharging as baseflow into the wetland during high flow conditions (spring melt and late fall rain events). However during low flow conditions (summer) the wetland appears to recharge the shallow groundwater system as evidenced by the mini-piezometer measurements. At the time of this study, the mini-piezometers installed in the bed of the small pond and large wetland to monitor the hydraulic gradient between the water body and groundwater were frozen (Figure 3). During the May 2006 monitoring event, the two (2) water bodies are at a higher hydraulic head than the shallow groundwater indicating recharge from the surface water bodies into the shallow overburden aquifer.

Local horizontal groundwater flow in the overburden aquifer follows the general local topography. The data indicates that the overall horizontal groundwater flow is directed south to southeast, with localized flow patterns to the north and northeast of the site (Figure 5). The horizontal hydraulic gradient in the overburden aquifer is approximately 0.016 metres per metre (m/m). The horizontal groundwater flow in the bedrock aquifer is similar to the overburden aquifer, flowing towards the east (Figure 6). The horizontal hydraulic gradient in the bedrock aquifer is lower than that of the overburden aquifer and is in the range of approximately 0.0035 metres per metre (m/m). Figures 5 and 6 present the estimated groundwater flow directions in the overburden and bedrock aquifers respectively based on the February 2006 monitoring event.

The vertical hydraulic gradient between the overburden aquifer and the underlying bedrock aquifer, based on groundwater elevation data is variable ranging from +0.023 (downward) at EBW/EMW12 to -0.012 (upward) at EBW/EMW14. This variability is indicative of potential change of overburden-bedrock aquifer hydraulic interaction across the site, whereby vertical groundwater movement between the two (2) aquifers is reversed from the downward direction north of the site to upward direction to the south. The second round of water level monitoring conducted in May 2006 validated this observation.

7.2.2 Aquifer Hydraulic Properties

Single Well Response Tests were (SWRTs) carried out at all installed monitoring wells (MW1 to MW8) on July 9, 2004 to estimate the hydraulic conductivity (K) of the shallow groundwater aquifer and to estimate horizontal groundwater velocities. The results of the SWRTs, which are shown in Table 1, indicate a range of hydraulic conductivities of between 3.3×10^{-4} metres per second (m/s) and 4.4×10^{-2} m/s with an average of 6.9×10^{-3} m/s.

As part of this study, SWRTs were completed in 2006 at 3 overburden monitoring wells (EMW12 to EMW14). The results are shown on Table 1 and in Appendix C. EMW13 was dry during the site

investigation. Based on the SWRTs, the hydraulic conductivity at EMW12 and EMW14 was estimated to be 1.7 x 10^{-6} m/s and 4.6 x 10^{-6} m/s respectively. Another method (Hazen method) was used to estimate the hydraulic conductivity based on grain size analysis. The results indicate a hydraulic conductivity range of 1 x 10^{-4}m/s to 6.6 x 10^{-5} m/s, which are relatively similar to the results reported from the SWRTs. The geometric mean of the hydraulic conductivities in the overburden aquifer using both methods at both tested locations is 1.5 x 10^{-5}m/s. This K-value is lower than the previously reported value of 6.9 x 10^{-3} m/s and is considered to be more representative of actual hydraulic conductivity values.

Based on a hydraulic gradient of 0.016 and soil porosity of 0.40 for a fine to medium sand aquifer, the estimated horizontal groundwater velocity is approximately 0.05 metres/day (18.3 metres/year). This relatively high groundwater velocity clearly illustrates the dynamics of the shallow groundwater system at the site and the fact that groundwater residence time in the sand matrix is relatively short.

A long-term pumping test was also completed at one of the bedrock monitoring wells (EBW14) to assess the hydraulic properties of the bedrock aquifer underlying the site (Figure 9). The results of the pumping test and associated recovery test are presented in Figure 9 and Appendix C. Based on the results of this pumping test, the hydraulic conductivity in the bedrock aquifer is estimated to range from 1.8 x 10^{-7} m/s based on the pumping test analysis to 1.6 x 10^{-8} m/s based on the recovery test analysis. The estimated hydraulic conductivity is within a typical range of K-values for fractured igneous and metamorphic rocks. The Transmissivity (T) and Storativity (S) values; which are calculated based on the hydraulic conductivity and the results of the pumping test are in the order of 7.7 x 10^{-6} m^2/s and 3.3 x 10^{-4} respectively. Transmissivity is defined as the rate at which water flows through a 1 metre wide vertical strip of the aquifer which extends through the full saturated thickness under a hydraulic gradient of 1. The estimated transmissivity for the bedrock aquifer is considered to be low, but can supply enough water for domestic wells. The Storativity of an aquifer is the representation of the volume of water released from storage, or taken into storage, per unit of aquifer storage area per unit change in head. Given that the value calculated for Storativity is between 10^{-5} and 10^{-3}, the bedrock aquifer is typical of a confined aquifer.

7.3 Analytical Results

At the time of this investigation, the following applicable environmental standards were used to assess the environmental quality of the soil and groundwater at the site.

Ontario Regulation 153/04

In October 2004, the MOE introduced “Ontario Regulation 153/04” (Part XV.1 of the Environmental Protection Act), hereafter referred to as “Regulation 153/04”. Regulation 153/04 details the requirements that property owners must meet in order to file a Record of Site Condition in addition to providing the Guideline for Use at Contaminated Sites in Ontario assessment procedures.

Two supporting technical documents, the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (MOE Standard), and the "Protocol for Analytical Methods Used in the Assessment of Properties Under Part XV.1 of the Environmental Protection Act" (MOE Protocol) were also released as part of the Regulation 153/04 requirements. The MOE Standard and the MOE Protocol, provide applicable site condition standards, and laboratory analytical protocols for the analysis of soil, sediment and groundwater, respectively. These documents replace the "Guideline for Use at Contaminated Sites in Ontario", (December 1996) hereafter referred to as the MOE Standard.

The Regulation 153/04 clean-up approach for contaminated sites utilizes generic site assessment/remediation criteria based on the effects the criteria may have on human health and the natural environment. It incorporates risk assessment through the provision of two clean-up scenarios: 1) Full Depth - restoration of soil quality to the full extent of the contamination; and 2) Stratified Depth - restoration of soil quality of the top 1.5 m following the full depth criteria; however, soil quality deeper than 1.5 m must be restored to stratified depth criteria. Each of these clean-up scenarios follows particular criteria for both soil and groundwater separated into three different land use designations (i.e. agricultural, residential/parkland, and industrial/commercial) in either a potable or non-potable groundwater situation.

The site is situated in rural forested area southwest of the Town of Gravenhurst, however the operations adjacent to the site, and future operations at the site (i.e. patrol yard), are considered to be industrial/commercial. The source of potable water for the surrounding area and for the patrol yard itself is through groundwater. To this end, applicable analytical results from the soil and groundwater samples collected from the site were compared against the full depth cleanup scenarios for industrial/commercial land use in a potable groundwater situation (Table 2 of the MOE Standards).

Ontario Drinking Water Standards

The Ontario Drinking Water Standards (ODWS) are a set of chemical and physical standards for drinking water implemented by the MOE and adopted from the Canadian Drinking Water Guidelines (CDWG). The objectives are either health-related or not health-related (aesthetic or operational guidelines). To this end, applicable analytical results from the monitoring well samples collected from the site were compared against the ODWS as a general indicator of the groundwater quality for drinking purposes for the site.

7.3.1 Results of Soil Analysis (Chemical)

The chemical results of the selected soil samples submitted for analysis were compared to the industrial/commercial land use remediation criteria outlined in Table 2 of the MOE Standards, assuming coarse-textured soils. The results of the chemical analysis for all of the soil samples submitted are presented in Tables 4 and 5 at the end of this report.

All soil samples collected and submitted for analysis met the applicable MOE Standards. It should be noted that Ecoplans previously reported low level concentrations of hydrocarbons at various locations (February 2005). However, the recent analytical results in February and May 2006 indicate that all analyzed petroleum hydrocarbon and BTEX parameters were below laboratory detection limits. All metals and general chemistry parameters analyzed were also well below the applicable MOE Standards.

The full analytical soil results as prepared by AGAT are included in Appendix D.

7.3.2 Results of Soil Analysis (Physical)

Ecoplans submitted nine (9) soil samples for physical analysis of grain-size and/or soil moisture content analysis to Thurber Engineering Ltd (Thurber). Based on the results of the grain-size analyses, most of the shallow aquifer is a fine-grained sand to sandy silt matrix. The results are presented in the borehole logs provided in Appendix B. The soil is predominantly composed of well-sorted fine-grained sands with silts and gravels. These are typical of glaciolacustrine deposits.

Based on the results of the soil moisture analyses, the moisture content range of the overburden deposits is between 2.21% at EMW13 and 25.97 % at EMW14. The low moisture content at EMW13 is due the topographical high in which it is located. The reported soil moisture contents and grain size analyses were typical for the nature of the soils encountered. These reported results are also consistent to what was observed in the field and as reported in the background information (i.e. geological maps and previous hydrogeological reports).

As per the ToR, five (5) soil samples were to be submitted to the laboratory for analysis of Atterberg Limits; however, all soil samples were non-cohesive and therefore the Atterberg Limits could not be determined. The results of the physical analysis for all of the subsurface soil samples are included in Appendix E.

7.3.3 Results of Groundwater Analysis

The chemical results of groundwater samples collected from the sixteen (16) monitoring wells in February/March and May 2006 were compared to Table 2 of the MOE Standards. For comparative purposes, the analytical results were also compared to the Ontario Drinking Water Standards (ODWS). The results of groundwater analysis are summarized in Tables 6, 7 and 8.

All groundwater sample parameters collected from the site are well below the applicable MOE Standards. In addition, all groundwater sample parameters collected from the site are well below the applicable ODWS for the parameters analysed, with the exception of the following:

Sample	Aquifer	Date	Parameter	Result (µg/L)	ODWS (µg/L)
EMW1	Overburden	Feb-06	Aluminum	171	100
EMW1	Overburden	May-06	Aluminum	133	100
EMW8	Overburden	Feb-06	Aluminum	122	100
EMW9	Overburden	May-06	Aluminum	105	100
EMW11	Overburden	Mar-06	Aluminum	404	100
EMW1	Overburden	Feb-06	Iron	16,300	300
EMW1	Overburden	May-06	Iron	10,600	300
EMW1	Overburden	Feb-06	Manganese	442	50
EMW1	Overburden	May-06	Manganese	387	50
EMW3	Overburden	Feb-06	Manganese	90.2	50
EMW3	Overburden	May-06	Manganese	70	50
EMW11	Overburden	May-06	Manganese	87.9	50
EMW12	Overburden	Feb-06	Manganese	104	50
EBW12	Bedrock	Mar-06	pH	8.85	6.5-8.5
EBW12	Bedrock	May-06	pH	8.93	6.5-8.5
EMW14	Overburden	Feb-06	pH	6.01	6.5-8.5
EMW12	Overburden	Feb-06	Hardness	19.9	80-100
EMW12	Overburden	May-06	Hardness	17.3	80-100
EBW12	Bedrock	Mar-06	Hardness	20.9	80-100
EBW12	Bedrock	May-06	Hardness	21.2	80-100
EBW13	Bedrock	Mar-06	Hardness	52	80-100
EBW13	Bedrock	May-06	Hardness	55.5	80-100
EMW14	Overburden	Mar-06	Hardness	8.74	80-100
EMW14	Overburden	May-06	Hardness	8.9	80-100
EBW14	Bedrock	Mar-06	Hardness	61.2	80-100
EBW14	Bedrock	May-06	Hardness	50.6	80-100

Overall, the noted ODWS exceedances are common in Ontario natural groundwater and are not believed to be as a result of any contamination. EMW exhibited anomalous concentrations of sulphates (105 to 131 mg/L) compared to lower concentration at all other monitoring wells. Basic treatment for aesthetic purposes will be required for the on-site water supply well for iron, manganese, and hardness. It should also be noted that there were no detections of any petroleum-related parameters at any of the monitoring locations. The full analytical groundwater results as prepared by AGAT are included in Appendix D.

B. HYDROGEOLOGICAL DESIGN

As per the Terms of Reference, this section interprets the findings of the hydrogeological investigation and provides the recommendations for planning, design, and operational purposes associated with the site. It should be noted that most of the deliverables specified in the ToR for the Hydrogeological Design section of the Report have been provided in various sections of the "Hydrogeological Investigation" section of this report. The following sections are specific to presenting a discussion and recommendations for planning and design of the Gravenhurst Patrol Yard.

8.0 SITE SUSCEPTIBILITY

The geology and hydrogeology of the site is such that a portion of the surface water (storm water) rapidly infiltrates through the permeable shallow sand aquifer as groundwater recharge. The shallow groundwater recharge component can load and transport any surface contamination into the shallow soil down into the shallow overburden sand aquifer where the contaminant(s) will then be transported by groundwater along the groundwater flow direction towards the southeast and could be potentially discharged into the large wetland (Figure 5). A groundwater component may also be flowing northeast and potentially discharging into Jevins Lake. This results in the site being susceptible to groundwater impacts resulting from patrol yard operations.

8.1 Receptors of Concern

Due to the groundwater flow in the aquifer potentially discharging into the wetland and/or other surface water bodies, any potential on-site groundwater impacts resulting from future patrol yard operations beyond the site boundary becomes a surface water issue as the sensitive receptor. The pathways for solute transport to the wetland are through both surface water and groundwater. There is the potential that patrol yard operations could impact the wetland ecology.

It should be noted that with respect to groundwater users in the area (a total of 7 in the area, all to the west and southwest of the site), any future patrol yard operations will not have an impact on the wells since these wells will be decommissioned to accommodate the proposed realignment of the Highway 11/169 interchange. Therefore, the only human receptors to any patrol yard impacts would be the future patrol yard facility.

Since the new patrol yard facility will require an on-site potable water supply and septic system, it is possible that through groundwater migration, the site's water supply may be impacted by patrol yard operations. The potable water for the yard will likely be supplied through a drilled well into the regional bedrock aquifer. Through proper design and construction of the well and septic system, any potential patrol yard impacts on the water supply would be minimized.

8.2 Reasonable Use Concept

The Ministry of the Environment's (MOE's) *"Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities"* (Policy B-7, formerly 15-08) establishes the basis for determining the reasonable use of groundwater on property adjacent to a waste disposal site and how to address the levels of contaminant discharges considered acceptable by the MOE.

This concept does not apply to this site because the site will not be a waste disposal site. However, for the purposes of this investigation, it can be a useful guideline and reference for quantitatively determining the acceptable concentration levels of a particular contaminant (chloride) in the groundwater, originating from the patrol yard sand/salt storage and garage/office building area (operations area), at its point of discharge and into the wetland to the southeast of the site.

Particular reference is made to MOE's *"Determination of Contaminant Limits and Attenuation Zones"* (Procedure B-7-1). This document applies the reasonable use concept to quantitative determinations of acceptable levels of various contaminants originating in waste disposal sites and impinging on adjacent properties; and assessing the suitability of a contaminant attenuation zone, and a disposal site.

This can be practically illustrated for this site by using the above-noted MOE Procedure B-7-1 to specifically determine the: A) allowable concentration levels of chloride at the property boundary (groundwater discharge areas), referred to as Cm, without having no more than a negligible or trivial effect on the existing or potential reasonable use of the adjacent property (wetland); and B) maximum concentration level of chloride originating from the operations area, referred to as Cw, that can be permitted to reach the groundwater discharge areas (wetland) without exceeding Cm.

The following calculations illustrate the concept:

A) Total Chloride Impact at Groundwater Discharge Area (Cm)

$$Cm = Cb + x(Cr - Cb)$$

where Cb = site background chloride concentration (average concentration from all monitoring wells)
Cr = ODWS Guideline for chloride (250 mg/L)
x = constant that reduces chloride to a level that is considered by the MOE to have only a negligible effect on the use of the water. In this case where chloride is not a health-related parameter, the constant is 0.5

$$Cm = 1.94 \text{ mg/L} + 0.50 (250 \text{ mg/L} – 1.94 \text{ mg/L}) = 126 \text{ mg/L}$$

B) Maximum Chloride Input From Source Area into Groundwater (Cw)

$$Cw = Cm - Cp - Co$$

where Cp = site background chloride concentration
Co = potential chloride increase from other sources with a high degree of probability.

$$Cw = 126 \text{ mg/L} – 1.94 \text{ mg/L} - 0 = 124.06 \text{ mg/L}$$

The above-noted calculations illustrate that in order to meet the Reasonable Use Concept at the proposed Gravenhurst Patrol Yard, the concentration levels of chloride in the groundwater at the source area (patrol yard operations area) must not exceed 126 mg/L in order to meet the allowable chloride levels at the discharge area (wetland) of 124 mg/L.

8.3 Water Budget Analysis

A water balance analysis was undertaken at the site as part of the drainage and storm water management report (MRC, 2006). The following section is an excerpt of this analysis.

In its simplest form, a water balance is the water that is left after water inputs and losses are considered. Water input is derived from precipitation while losses are due to evaporation and transpiration (ignoring consumptive use). Therefore, the water balance can be simply expressed as

Water Balance = Precipitation – Evapotranspiration

Because Precambrian bedrock underlies the site and is at or very close to the surface, infiltration was not considered in the water balance. For this site, evapotranspiration is the primary loss in the water balance and the water balance will reflect mainly the surface runoff.

A water balance is usually calculated as an annual value, using climate normals to determine the precipitation and other parameters required for the analysis. Climate normals are thirty year averages of climate parameters such as precipitation and temperature, usually provided on a monthly basis and updated each decade by Environment Canada. The Canadian Climate Normals for the Muskoka meteorological station from 1971 – 2000 were used to obtain the temperature and precipitation data used in the analysis.

The Thornthwaite method was used to determine evapotranspiration. This is a widely used empirical approach that uses a monthly heat index determined from mean monthly temperatures. Using the annual temperature distribution, the consumptive use by vegetation (potential evapotranspiration) was determined for a maximum soil moisture capacity based on soil and land use type. The actual evapotranspiration was determined for each month of above freezing temperatures based on the cumulative monthly potential water loss and the actual precipitation. For future conditions, empirical

relationships for roof and pavement evaporation developed by staff of Ecoplans Limited and McCormick Rankin were used to augment the Thornthwaite calculations.

The water balance was calculated for existing conditions using the 5.38 ha subcatchment that drains to the outlet of the proposed patrol yard. For future conditions, a drainage area of 5.16 ha was used, reflecting the addition of 0.3 ha from subcatchment S1 in the northeast portion of the site and the removal of 0.52 ha from the south west portion of the site that will drain south.

Table 9 presents the results of the water balance calculations on a seasonal basis. The results show the variation in infiltration and runoff throughout the year, and demonstrate that only a minor soil moisture deficit (3 mm) develops over the summer period.

The difference between the existing conditions and the post development conditions is an increase in the direct runoff component under post development conditions and a corresponding decrease in evapotranspiration. Table 9 indicates that on an annual basis there will be an increase of 60 mm in direct runoff, mainly during the spring and summer period.

9.0 MITIGATION MEASURES

Through proper planning and design, a functional patrol yard facility can be constructed and operated on the site with due regard to the natural environment. This can only be achieved if proper mitigation measures are incorporated into the design, construction and operation of the facility to ensure that the potential for groundwater impacts resulting from patrol yard activities is minimal.

Potential groundwater impacts at a typical patrol yard are typically generated from the release of storm water and washwater generated in the operations area of the site into the environment. Stormwater refers to water generated from storm events (rain and snow meltwater) and washwater refers to water generated from vehicle washings. Groundwater impacts may also be generated as a result of fuel accidental release or spillage.

Existing Stormwater Management

At most existing patrol yards wherein the operations area is asphalted, there is no on-site management of stormwater; the water is allowed to drain to site ditches via overland flow. This results in the release of surface water containing potential contaminants such as road salt (sodium and chloride), petroleum hydrocarbons and heavy metals (noting that petroleum hydrocarbons and heavy metals are generally of a lesser impact than road salt) into the environment. Some of the surface water then infiltrates into the groundwater and the remainder flows off-site into roadside ditches, or into surface water courses.

At some yards, stormwater is managed through the collection of stormwater into catch-basins in the operations area which are connected to an oil/water separator prior to being released into municipal sewers or into site ditches. This system provides some level of treatment, capturing a significant mass of petroleum hydrocarbons; however, it does not remove appreciable amounts of sodium and chloride.

Existing Washwater Management

At most existing patrol yards, washwaters are managed through the collection of washwater into catch-basins inside wash or garage bays which are connected to an oil/water separator prior to being released into municipal sewers or into site ditches. At some yards vehicles are washed outside resulting in the release of washwater into the operations area and then this water gets treated as stormwater.

Based on the current on-site stormwater and washwater management systems at most existing patrol yards, there is the need to improve the containment and treatment of stormwater and washwater generated at patrol yards. This will significantly reduce the potential for salt impacts to the environment. Since the Gravenhurst site is very susceptible to patrol yard impacts, any direct release of environmentally impacted stormwater and washwater into the soil and groundwater could potentially impact the wetland. As such these waters will have to be appropriately managed through the following general methods:

- collection and containment of waters into holding tanks which can either be disposed of off-site; or contained and re-used as salt brine;
- collection and containment of waters in a lined detention pond to allow suspended solids and petroleum hydrocarbons to settle out and separate; and to allow sufficient time to cause density stratification of chlorides. The treated water would then outlet into the environment.

Table 10 included in Appendix F summarizes the various design alternatives. The advantages and disadvantages, risks/consequences, and approximate costs of each alternative are presented.

9.1 Preferred Mitigation Alternative

Based on the various design alternatives presented in Table 10, the preferred alternative would be Design Alternative #4 (Patrol Yard with Large Lined Salt Storage Facility and Wash Bay) adopting the second approach: managing washwater through a filter system and holding tanks to be re-used as salt brine for road de-icing operations; and managing stormwater through overland flow into the perimeter drainage ditches upgradient of wetland or into the new highway interchange drainage system. The main reasons for this are:

- Of all mitigation alternatives this system carries the least environmental risk.

- All salt handling and storage, and truck washing is carried out inside the building with salt losses (and petroleum hydrocarbons) collected and contained in holding tanks.

- The system would be relatively cheap to construct since there is no need to construct a detention pond. The only significant costs would be installing the liner.

- A MOE Certificate of Approval may not be required for the washwater filter system.

- Since the washwater would be re-used as salt brine for road de-icing operations, winter road maintenance costs could be reduced.

The only potential disadvantages are that the filter technology is relatively new and therefore could be subject to long-term performance limitations; and any significant salt releases (spills) outside in the operations area could impact the environment, if not quickly cleaned up.

For the system to operate effectively, the following patrol yard design and operational mitigation measures must be adopted:

<u>Site Design:</u>

- Minimize the size of the operations area to reduce the stormwater catchment area which would

result in the reduction of potentially salt impacted stormwater.
- Maximize the separation distance between the operations area and large wetland to increase the capacity for groundwater chloride dilution.

Good Housekeeping Practices:

- Implement good housekeeping practices following the principles outlined in Transportation of Canada's *Synthesis of Best Practices Road Salt Management - 7.0 Design and Operations of Road Maintenance Yards*.

Contingency Measures

In the event of a salt spill outside of the building or in the event of a breach in the engineered geo-membrane liner, the following contingency measures should be adopted:

- Quickly respond to the spill/breach and mitigate to minimize salt losses to groundwater.
- Shortly after the spill/breach, carry out a groundwater quality sampling program of all wells downgradient of the spill/breach to determine if the groundwater has been impacted.

It should be noted that other than monitoring the groundwater little can be done to mitigate salt impacted groundwater. However, given the relatively high groundwater velocity and thick sandy aquifer, solute dilution would play a significant mechanism in reducing environmental impacts.

10.0 Proposed Long Term Monitoring Program

An integral component of the patrol yard design is to design and implement a long-term groundwater and surface water quality monitoring program to evaluate the performance of the patrol yard operations with respect to the environment. This is particularly important for assessing the integrity of the geo-membrane liner.

10.1 Groundwater Quality Monitoring Program

The groundwater quality monitoring program should be in place prior to and during the Site's operation. There are presently seventeen (17) monitoring wells on-site (Figure 3). Three (3) of the monitoring wells (EBW12 to EBW14) are screened in bedrock (bedrock wells), the other fourteen (14) monitoring wells are screened in the overburden sand aquifer (overburden wells). An additional overburden monitoring well is recommended to be installed northeast of the proposed yard to clarify the significance of this area as a seepage pathway and provide another downgradient monitoring location. Construction of the patrol yard may impact the following monitoring wells: EMW3, EMW4, EMW5, EMW6, EMW7, and EMW8. If impacts in the vicinity of these wells are anticipated, these wells will have to be appropriately decommissioned in accordance with O.Reg 903 prior to any activity in their immediate vicinity. The remaining nine (9) monitoring wells and recommended additional well should be used during the groundwater quality monitoring program. The monitoring program should include chemical testing of groundwater at each well location prior to (i.e. baseline) and during patrol yard operations.

Chemical analysis of groundwater samples from each well should be completed on a semi-annual basis. Sampling should be conducted in early spring (i.e. during spring melt) and late summer. Sample analyses should include metals, chloride, total petroleum hydrocarbons, and BTEX. This would allow timely groundwater data and could thus provide a trigger in the event that groundwater quality deteriorates at which time some level of corrective action will be required (e.g. improve good housekeeping practices or assess the integrity of the liner). The trigger would be consistent with MOE's Reasonable Use Concept. This trigger could be defined as that point when chloride concentration in the groundwater at the source area reaches a level of 124 mg/L. The groundwater monitoring program should be re-evaluated after two (2) years of implementation. At a later stage, the groundwater quality monitoring program may be downgraded to a lesser frequency depending on the efficiency of the Site's mitigation design and actual operation.

10.2 Surface Water Quality Monitoring Program

Collection and chemical analysis of surface water samples should be collected from the small pond and large wetland. Sample analyses should include metals, chloride, total petroleum hydrocarbons, and BTEX. Surface water sampling should be initially carried out on a semi-annual (i.e. low flow and high flow) basis to allow timely surface water data and thus provide a trigger at which time some level of corrective action will be required. This trigger, which would be consistent with MOE's Reasonable

Use Concept, would depend on the site design. The surface water monitoring program should be re-evaluated after two (2) years of implementation.

10.3 Washwater Quality Monitoring Program

Collection and chemical analysis of washwater should be collected in the holding tanks to determine if the washwater can be re-used as brine or be otherwise disposed of off-site at a MOE licensed wastewater treatment facility. Sample analyses should include metals, chloride and total petroleum hydrocarbons. Samples should be collected at the time when the holding tanks are full.

11.0 QUALIFICATIONS OF THE ENVIRONMENTAL CONSULTANT

Ecoplans Limited, established in 1970, provides consulting services in the biological and physical sciences, environmental planning, landscape architecture, environmental impact assessment, and environmental site assessment and remediation. Ecoplans' staff includes specialists in all facets of the environmental field. The Environmental Site Assessment and Remediation Division of Ecoplans Limited specializes in Phase I, II and III Environmental Site Assessments, electromagnetic surveys, aboveground and underground storage tank removals/assessments, groundwater investigations and site remediation/restoration. Ecoplans has completed numerous Phase I and Phase II Environmental Site Assessments for both the public and private sector. Some of the more significant clients include the Ministry of Transportation, GO Transit, Ontario Realty Corporation, Regional Municipality of Peel, Greater Toronto Airports Authority, Medallion Properties Inc., and Marshall-Barwick Inc.

Mr. Derek Stewart, B.Sc., P.Geo., as Senior Hydrogeologist, is the head of Ecoplans' Environmental Site Assessment & Remediation Division. Mr. Stewart has 15 years experience carrying out site assessments and remediation projects working for a number of environmental consulting firms. He has been with Ecoplans since 1996. At the project level, Mr. Stewart provides technical and editorial support to his staff, and peer reviews all draft and final reports prior to being sent to the client.

Mr. Martin Gedeon, M.Sc., P.Geo., is a Hydrogeologist working with Ecoplans' Environmental Site Assessment & Remediation Division. Mr. Gedeon is licensed as a professional geoscientist in the Province of Ontario. Mr. Gedeon has over nine (9) years of experience as an environmental/hydrogeological consultant in the areas of groundwater monitoring, environmental impact assessment, due diligence and remediation. Mr. Gedeon has significant experience in physical and contaminant hydrogeology across Canada and overseas and provides hydrogeological/environmental technical support to various projects with Ecoplans.

Ms. Kerry-Anne Pumphrey, B.Sc., is a Junior Hydrogeologist working with Ecoplans Environmental Site Assessment & Remediation Division. Ms. Pumphrey has an extensive academic background in hydrogeology, soil science and soil transport mechanisms. Ms. Pumphrey has experience conducting Phase I and II Environmental Site Assessments.

12.0 CLOSURE

There is no warranty, expressed or implied, by Ecoplans Limited that the foregoing subsurface investigation portion of the hydrogeological study has uncovered all potential contaminants or sources of contaminants on the site.

The results of the subsurface investigation are based upon the total number of sampling points and the depth of investigation. These are considered to be fairly representative of the soil and groundwater conditions within each area tested. It should be noted, however, that any assessment regarding the presence of contamination on the property is based on interpretation of conditions determined at specific sampling locations and depths. This assessment cannot guarantee that isolated pockets of contaminated soil and groundwater are not located on the site within areas not addressed by this project. The overall chemical and physical parameters tested have been chosen to reflect the potential contamination sources identified and therefore, conclusions regarding site environmental compliance are limited to those areas and parameters tested.

The report has been peer reviewed by Rob Blair (RAQS registered Hydrogelogist) of Golder Associates Ltd. The cover letter is provided in Appendix F.

The distribution of this report is intended solely for the client. Ecoplans does not assume any third-party liability based on the unauthorized distribution of this report.

We trust the information outlined in this report meets with your requirements.

Yours truly,

Ecoplans Limited **Reviewed by:**

Martin Gedeon, M.Sc., P.Geo.
Hydrogeologist

Derek A. Stewart, B.Sc., P.Geo.
Senior Hydrogeologist

13.0 REFERENCES

Canadian Standards Association, CSA Standard Z769-00 - Phase II Environmental Site Assessment, March 2000.

Ecoplans Limited, Hydrogeological Investigation Report, Gravenhurst Patrol Yard, Site Selection and class Environmental Assessment Study, February 2005.

Ecoplans Limited, Hydrogeological Design Report, Gravenhurst Patrol Yard, Site Selection and class Environmental Assessment Study, February 2005.

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Environmental Protection Act, Waste Management – Reg. 347, R.R.O. 1990, plus all applicable amendments.

McCormick Rankin Corporation, Drainage and Storm Water Management, January 2006.

Ontario Ministry of the Environment, Ontario Drinking Water Standards, revised June 2003.

Ontario Ministry of the Environment, Guideline for Use at Contaminated Sites in Ontario. Revised September 1998.

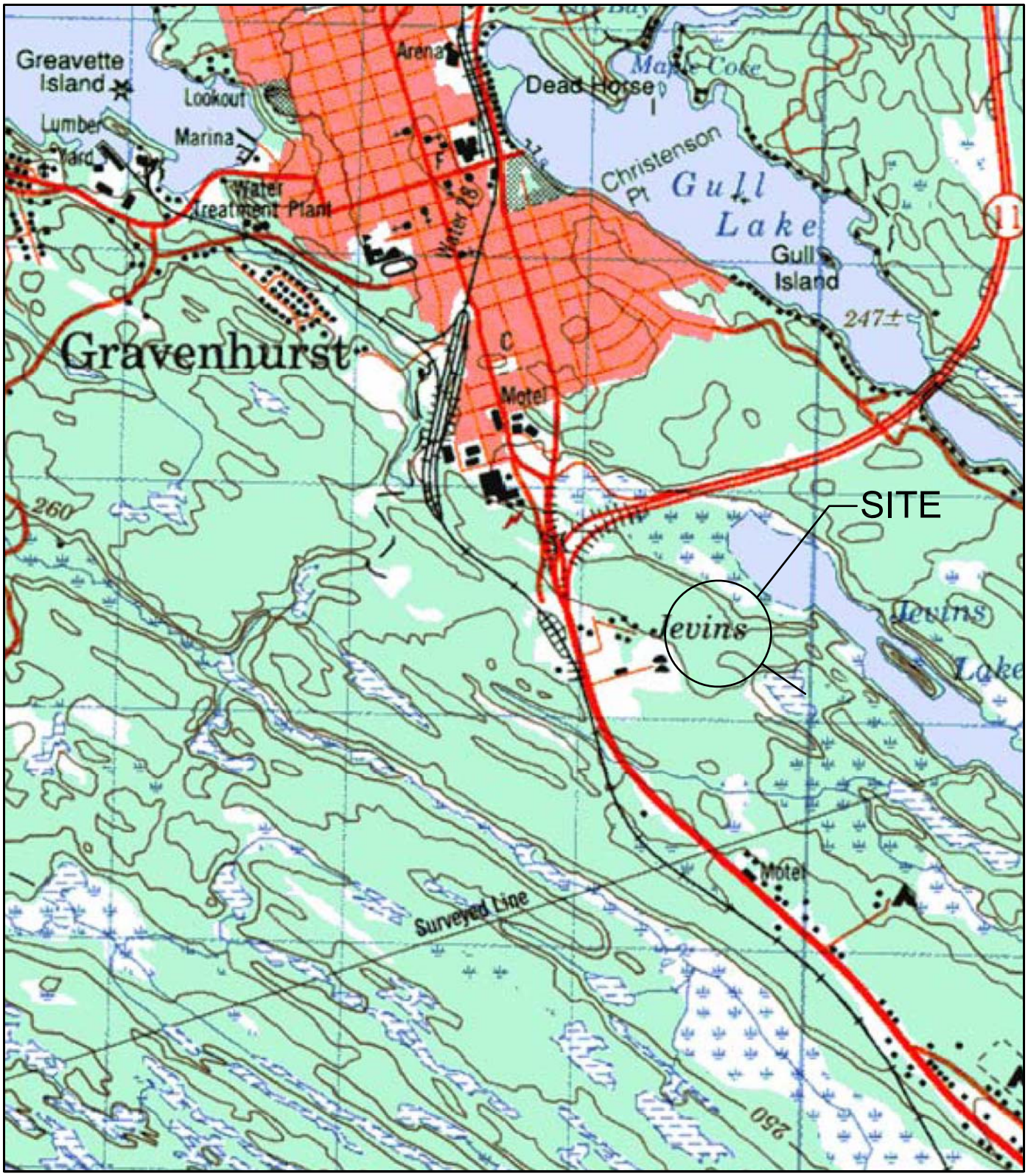
Ontario Ministry of the Environment, Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, December 1996.

Ontario Ministry of the Environment Water Well Database.

Ontario Ministry of Northern Development and Mines, Map 2556 - Quaternary Geology of Ontario – Southern Sheet, 1991.

Town of Gravenhurst Water and Sanitary Services System Plan.

FIGURES



Source: Canada Center for Mapping, Department of Energy, Mines and Resources, Gravenhurst, 31 D/14 Edition 4, 1994

Approximate Scale: 1:23,000

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e-mail: ecoplans@ecoplans.com

MTO GRAVENHURST PATROL YARD
HYDROGEOLOGICAL INVESTIGATION AND DESIGN REPORT
SITE LOCATION

CONT No
WP No 5420-02-00

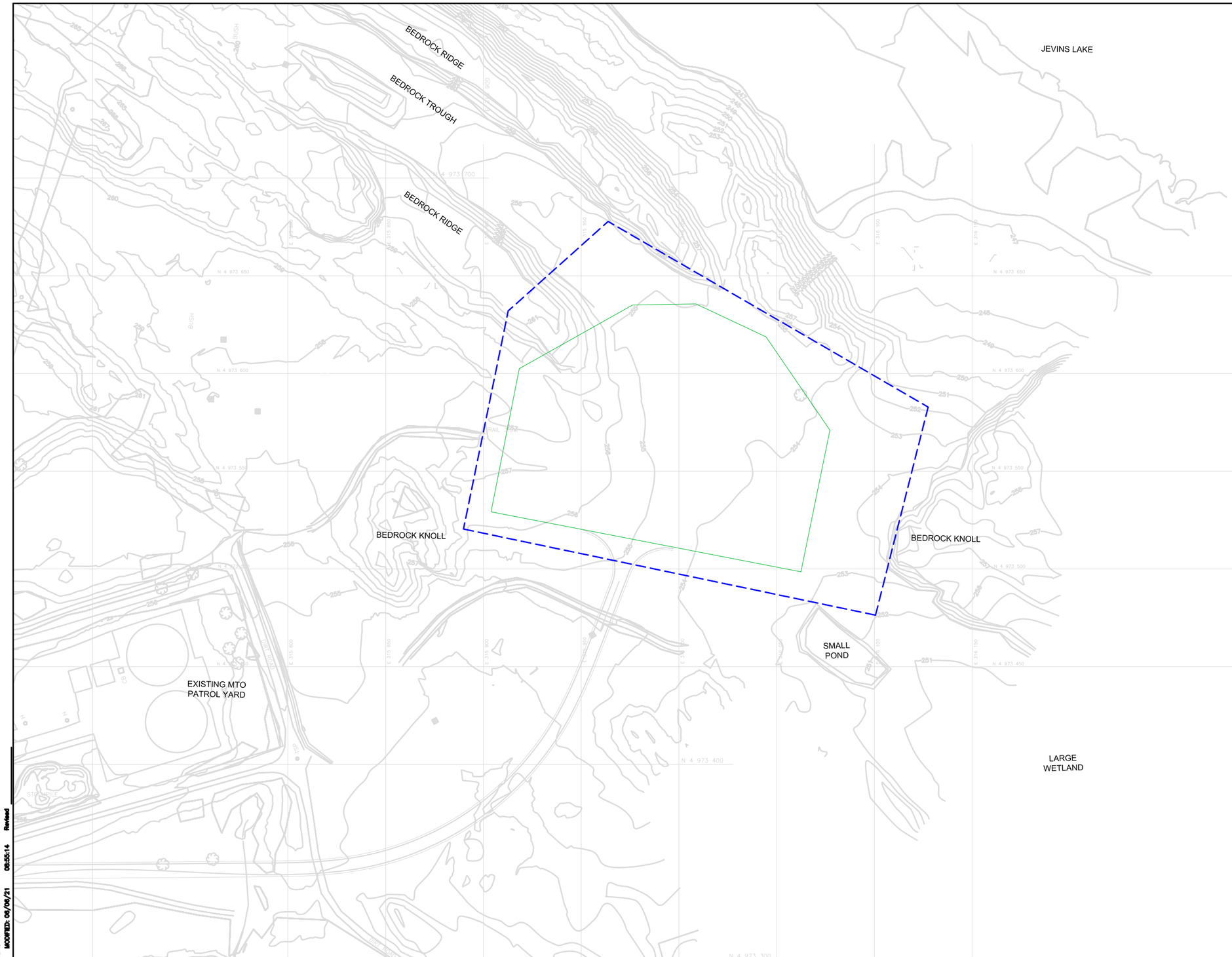
Date: April 2007

Project No.: R05-0226

Figure No. 1

CONT No
WP No 5420-02-00

MTO GRAVENHURST PATROL YARD
HYDROGEOLOGICAL INVESTIGATION
AND DESIGN REPORT
SITE PLAN



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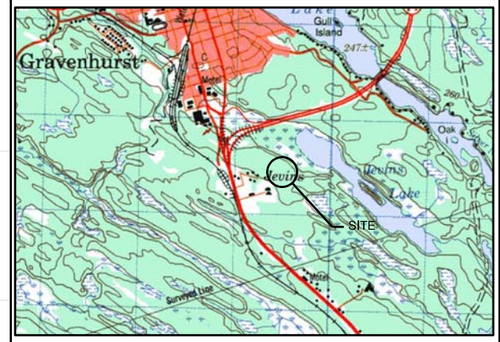

Source: Canada Center for Mapping, Department of Energy, Mines and Resources, Gravenhurst, 31 D/14 Edition 4, 1994

Approximate Scale: 1 : 63,000
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LEGEND

APPROXIMATE SITE LIMITS

APPROXIMATE FOOTPRINT OF OPERATIONS AREA

Sources : 1) Base Map: Provided by McCormick Rankin Corp.
2) Ecoplans Site Visit, JANUARY 2006
3) Ecoplans Site Visit, FEBRUARY 2006

Approximate Scale: 1 : 2000
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Checked By.: D. Stewart
Date: April 2007
Project No.: R05-0226
Figure No. 2

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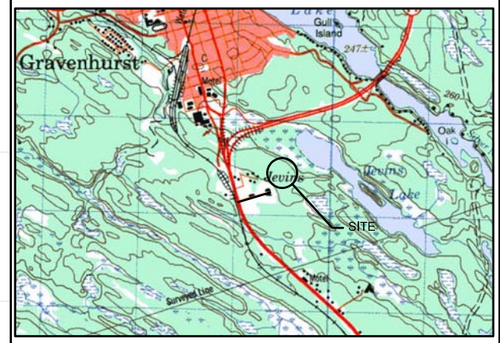
DRAWING NAME: Final Site Plan.DWG
DRAWN BY: G. Yang
MODIFIED: 09/06/21 08:55:14 Revised

CONT No
WP No 5420-02-00

MTO GRAVENHURST PATROL YARD
HYDROGEOLOGICAL INVESTIGATION
AND DESIGN REPORT
MONITORING WELL LOCATIONS

BEDROCK RIDGE
BEDROCK TROUGH
BEDROCK RIDGE
JEVINS LAKE
EMW11
EMW12
EBW12
EMW5 EMW6
EMW7
EMW8
EBW13
EMW13
BEDROCK KNOLL
BEDROCK KNOLL
EMW10
EMW9
EMW3
EMW4
SMALL POND
P2
EMW14
EBW14
EMW2
EXISTING MTO PATROL YARD
LARGE WETLAND
EMW1
P2

KEY PLAN



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Approximate Scale: 1 : 63,000
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- ECOPLANS BEDROCK MONITORING WELL EBW (ECOPLANS, JANUARY & FEBRUARY 2006)
- MINI-PIEZOMETER
- APPROXIMATE SITE LIMITS
- APPROXIMATE FOOTPRINT OF OPERATIONS AREA

Sources:
1) Base Map: Provided by McCormick Rankin Corp.
2) Ecoplans Site Visit, JANUARY 2006
3) Ecoplans Site Visit, FEBRUARY 2006
4) Ecoplans Survey, MARCH 2006

Approximate Scale: 1 : 2000
0 25 50 75 100m

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e-mail: ecoplans@ecoplans.com

Drawn By: G. Yang
Checked By.: D. Stewart
Date: April 2007
Project No.: R05-0226
Figure No. 3

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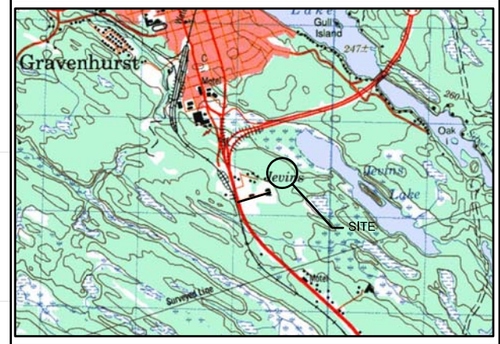
DRAWN BY: G. Yang
MODIFIED: 09/06/21 08:55:14 Revised

CONT No
WP No 5420-02-00

MTO GRAVENHURST PATROL YARD
HYDROGEOLOGICAL INVESTIGATION
AND DESIGN REPORT
OVERBURDEN THICKNESS

KEY PLAN



Source: Canada Center for Mapping, Department of Energy, Mines and Resources, Gravenhurst, 31 D/14 Edition 4, 1994

Approximate Scale: 1 : 63,000
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LEGEND

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- ECOPLANS BEDROCK MONITORING WELL EBW (ECOPLANS, NOVEMBER 2005)
- GOLDER GEOTECHNICAL BOREHOLE G-BH (GOLDER, NOVEMBER 2005)
- (2.13m) OVERBURDEN THICKNESS
- APPROXIMATE SITE LIMITS
- APPROXIMATE FOOTPRINT OF OPERATIONS AREA

JEVINS LAKE
BEDROCK RIDGE
BEDROCK TROUGH
BEDROCK RIDGE
BEDROCK KNOLL
BEDROCK KNOLL
SMALL POND
LARGE WETLAND
EXISTING MTO PATROL YARD

EMW11 (2.13m)
EMW12
EBW12 (8.8m)
G-BH14 (6.6m)
G-BH26 (0m)
G-BH6 (7.3m)
G-BH13 (5.9m)
G-BH32 (0m)
G-BH25
G-BH5 (3.2m)
G-BH12 (3.8m)
G-BH19 (0m)
G-BH31 (0m)
EMW5 (>5.6m)
EMW6 (>3.1m)
G-BH37 (0m)
G-BH43 (2.5m)
G-BH49
G-BH11 (6.6m)
G-BH24 (0.55m)
G-BH18 (0m)
G-BH42
G-BH4 (8.4m)
(>EMW7
G-BH30
G-BH36
EBW13 (3.8m)
EMW13
EMW8
G-BH10 (7.3m)
G-BH41
G-BH48 (0.25m)
G-BH17 (11.6m)
(>3.2m)
G-BH23
G-BH3 (6.3m)
G-BH29
G-BH9 (3.6m)
G-BH16 (9.1m)
G-BH35 (1.7m)
G-BH47 (0.65m)
G-BH22
G-BH2 (11m)
G-BH8 (1.9m)
G-BH40
G-BH46 (0m)
G-BH15 (6.9m)
G-BH21
G-BH1 (5m)
G-BH28
G-BH7 (2m)
EMW10 (>3.8m)
G-BH20
G-BH34
G-BH39
G-BH45
EMW9 (>3.8m)
G-BH27
EMW3 (>16.5m)
EMW4 (>4.6m)
G-BH33
G-BH38
EMW14
EBW14 (17.1m)
EMW2 (>2.1m)
G-BH44 (>5m)
EMW1 (>2.3m)

Sources:
1) Base Map: Provided by McCormick Rankin Corp.
2) Ecoplans Site Visit, JANUARY 2006
3) Ecoplans Site Visit, FEBRUARY 2006
4) Ecoplans Survey, MARCH 2006
5) Legal Survey by J.D.Barnes JULY 2004
6) Golder Sketch Map, November 2005

Approximate Scale: 1 : 2000
0 25 50 75 100m

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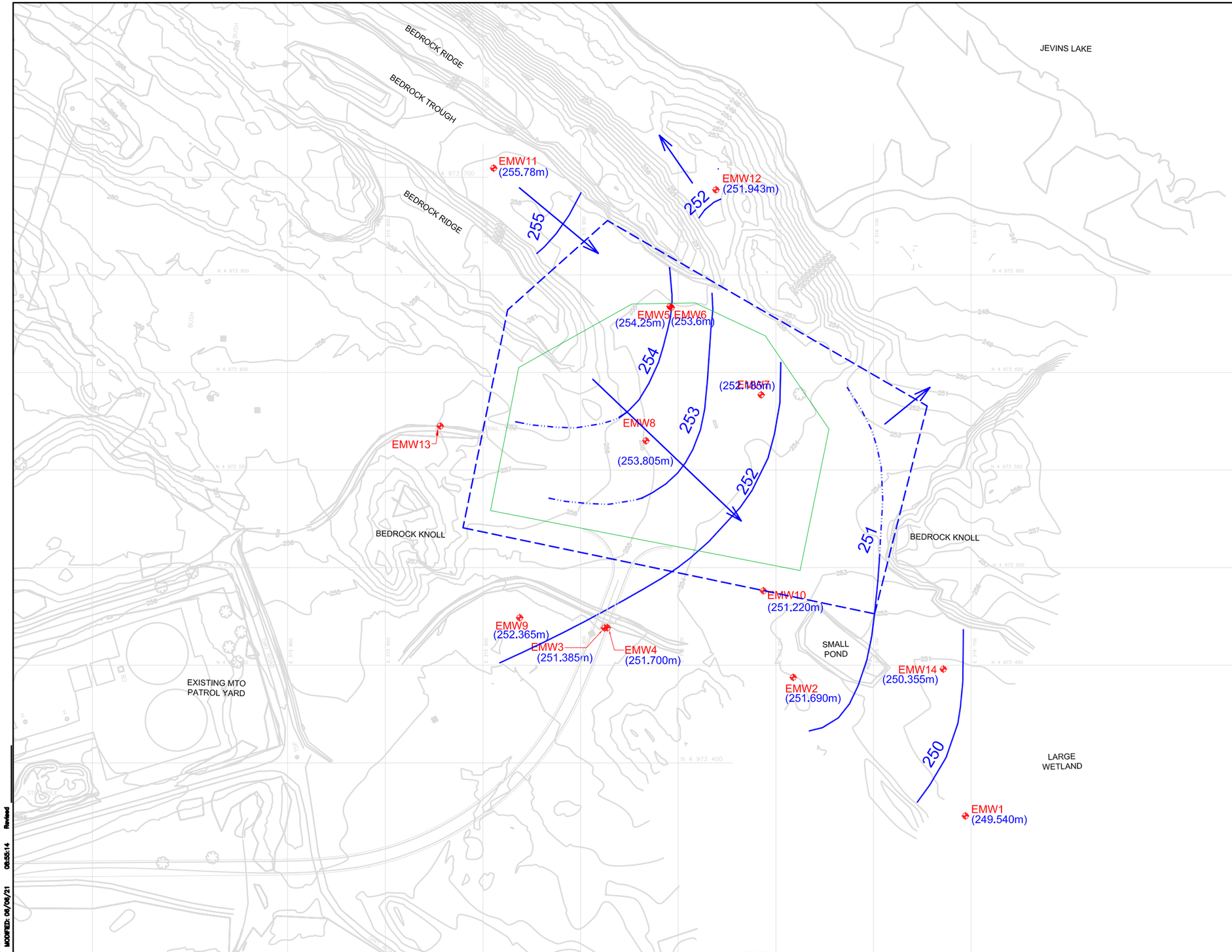
Checked By.: D. Stewart	Project No.: R05-0226	

FILE LOCATION=I:\ECOPLANS\03 - REMEDIATION\PROJECTS\R05-0226 GRAVENHURST PATROL YARD DD\0226-DRAWINGS\
DRAWING NAME: Final Site Plan.DWG
DRAWN BY: G. Yang
MODIFIED: 06/06/21 08:55:14 Revised

CONT No
WP No 5420-02-00

MTO GRAVENHURST PATROL YARD
HYDROGEOLOGICAL INVESTIGATION
AND DESIGN REPORT
OVERBURDEN GROUNDWATER
ELEVATION CONTOURS



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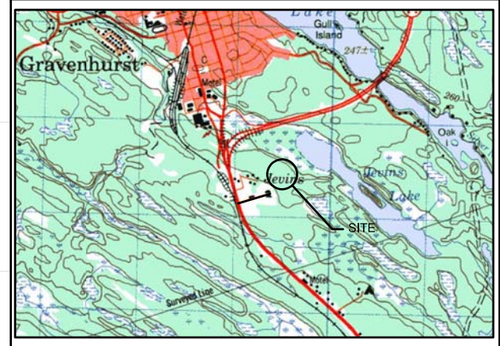

Source: Canada Center for Mapping, Department of Energy, Mines and Resources, Gravenhurst, 31 D/14 Edition 4, 1994

Approximate Scale: 1 : 63,000
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LEGEND

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- (250.355m) GROUNDWATER ELEVATION FEBRUARY 27, 2006
- INFERRED DIRECTION OF GROUNDWATER FLOW IN OVERBURDEN AQUIFER
- GROUNDWATER CONTOUR
- INFERRED GROUNDWATER CONTOUR
- APPROXIMATE SITE LIMITS
- APPROXIMATE FOOTPRINT OF OPERATIONS AREA

Sources:
1) Base Map: Provided by McCormick Rankin Corp.
2) Ecoplans Site Visit, JANUARY 2006
3) Ecoplans Site Visit, FEBRUARY 2006
4) Ecoplans Survey, MARCH 2006
5) Legal Survey by J.D.Barnes JULY 2004
6) Golder Sketch Map, November 2005

Approximate Scale: 1 : 2000
0 25 50 75 100m

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e-mail: ecoplans@ecoplans.com

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G. Yang	April 2007	5
Checked By.: D. Stewart	Project No.: R05-0226	

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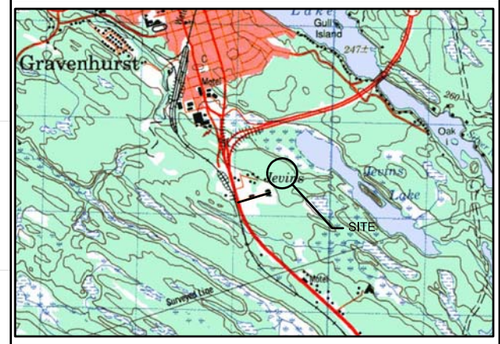
DRAWN BY: G. Yang
MODIFIED: 06/06/21 08:55:14 Revised

CONT No
WP No 5420-02-00

MTO GRAVENHURST PATROL YARD
HYDROGEOLOGICAL INVESTIGATION
AND DESIGN REPORT
BEDROCK GROUNDWATER
ELEVATION CONTOURS

KEY PLAN



Source: Canada Center for Mapping, Department of Energy, Mines and Resources, Gravenhurst, 31 D/14 Edition 4, 1994

Approximate Scale: 1 : 63,000
0 250 500 750 1000m

LEGEND

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- TREES
- INFERRED DIRECTION OF GROUNDWATER FLOW IN BEDROCK AQUIFER
- GROUNDWATER CONTOUR
- (251.178m) GROUNDWATER ELEVATION FEBRUARY 27, 2006
- APPROXIMATE SITE LIMITS
- APPROXIMATE FOOTPRINT OF OPERATIONS AREA

JEVINS LAKE
BEDROCK RIDGE
BEDROCK TROUGH
BEDROCK RIDGE
EBW12 (251.178m)
EBW13 (251.74m)
251.5
251.25
251
BEDROCK KNOLL
BEDROCK KNOLL
SMALL POND
EBW14 (250.860m)
EXISTING MTO PATROL YARD
LARGE WETLAND

Sources:
1) Base Map: Provided by McCormick Rankin Corp.
2) Ecoplans Site Visit, JANUARY 2006
3) Ecoplans Site Visit, FEBRUARY 2006
4) Ecoplans Survey, MARCH 2006
5) Legal Survey by J.D.Barnes JULY 2004
6) Golder Sketch Map, November 2005

Approximate Scale: 1 : 2000
0 25 50 75 100m

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Checked By.: D. Stewart	Project No.: R05-0226	

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DRAWING NAME: Final Site Plan.DWG
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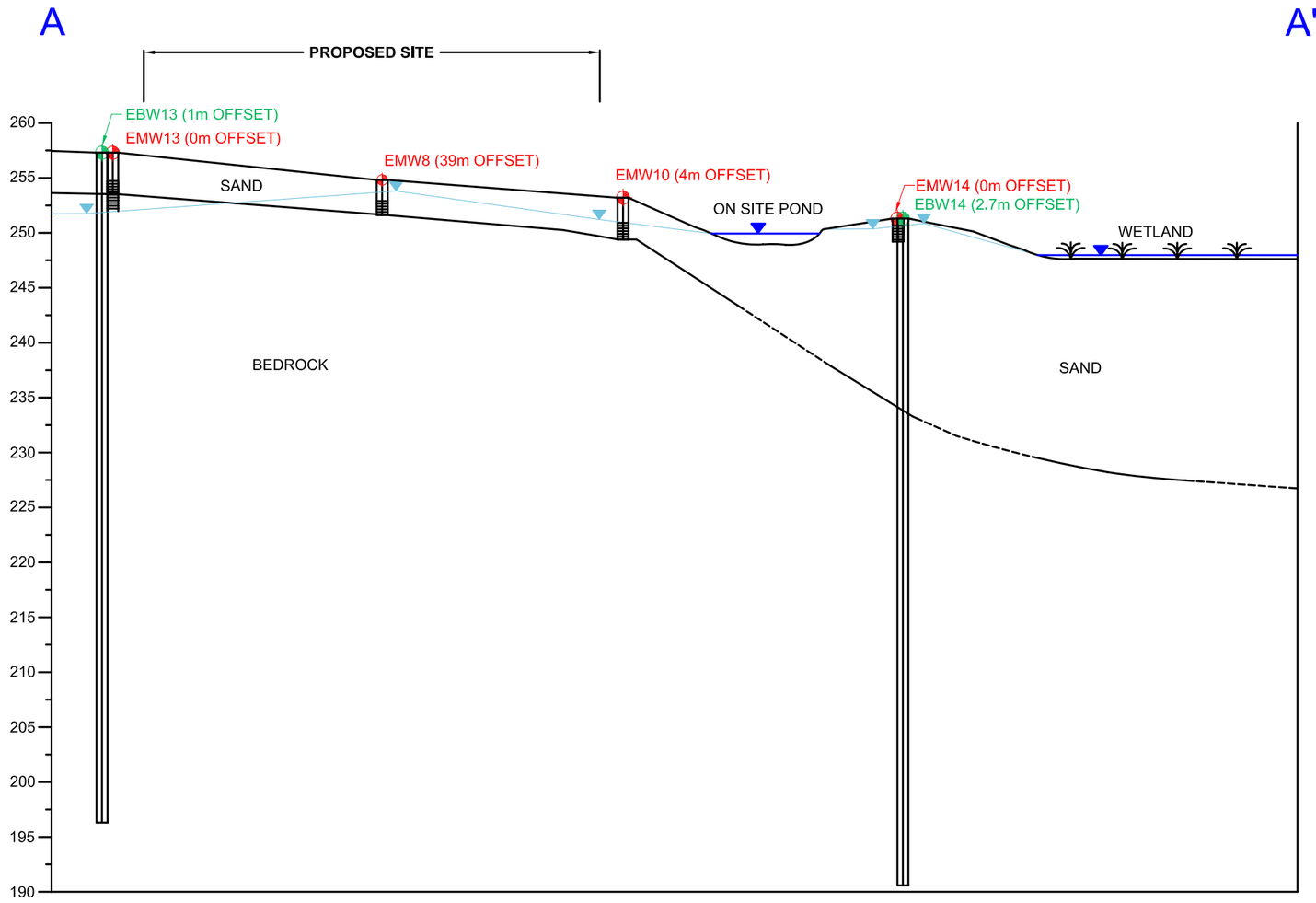
MODIFIED: 06/06/21 08:55:14 Revised

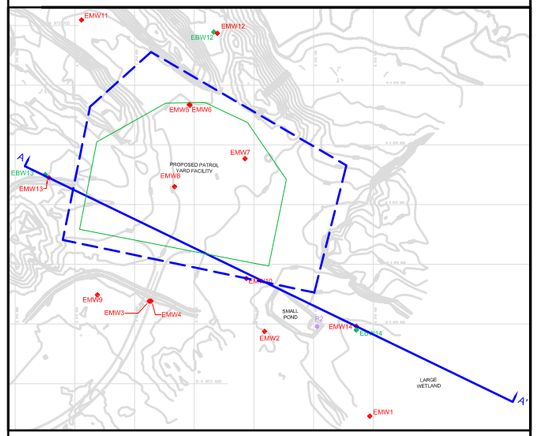


CROSS-SECTION A - A'

CONT No
WP No 5420-02-00

MTO GRAVENHURST PATROL YARD
HYDROGEOLOGICAL INVESTIGATION
AND DESIGN REPORT
CROSS-SECTION A-A'

CROSS-SECTION LOCATION



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  EBW (ECOPLANS, JANUARY & FEBRUARY 2006)
- ECOPLANS OVERBURDEN MONITORING WELL
  EMW (ECOPLANS, NOVEMBER 2005)
- GROUNDWATER LEVEL
- SURFACE WATER LEVEL
- WETLAND

Sources:
1) Base Map: Provided by McCormick Rankin Corp.
2) Ecoplans Site Visit, JANUARY 2006
3) Ecoplans Site Visit, FEBRUARY 2006
4) Ecoplans Survey, MARCH 2006
5) Legal Survey by J.D.Barnes JULY 2004
6) Golder Sketch Map, November 2005

VERTICAL SCALE: 1:500
HORIZONTAL SCALE: 1:2000

0m 5 10 15 20
0m 20 40 60 80

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e-mail: ecoplans@ecoplans.com

Drawn By:	Date:	Figure No.
G. Yang	April 2007	7
Checked By.: D. Stewart	Project No.: R05-0226	

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DRAWING NAME: Final Site Plan.DWG
DRAWN BY: G. Yang
MODIFIED: 06/06/21 08:55:14 Revised

B

B'

PROPOSED SITE

EBW12 (2m OFFSET)

EMW12 (1.2m OFFSET)

EMW5 (10.1m OFFSET)
EMW6 (9.4m OFFSET)

EMW8 (8.7m OFFSET)

EMW4 (9.2m OFFSET)
EMW3 (10.5m OFFSET)

SAND

SAND

BEDROCK

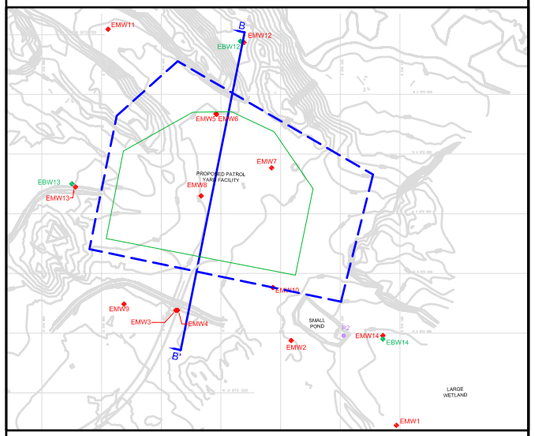
260
255
250
245
240
235
230
225
220
215
210
205
200
195
190

CROSS-SECTION B - B'

CONT No
WP No 5420-02-00

MTO GRAVENHURST PATROL YARD
HYDROGEOLOGICAL INVESTIGATION
AND DESIGN REPORT
CROSS-SECTION B-B'

CROSS-SECTION LOCATION



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LEGEND

- ECOPLANS BEDROCK MONITORING WELL
  EBW (ECOPLANS, JANUARY & FEBRUARY 2006)
- ECOPLANS OVERBURDEN MONITORING WELL
  EMW (ECOPLANS, NOVEMBER 2005)
- GROUNDWATER LEVEL
- SURFACE WATER LEVEL

Sources:
1) Base Map: Provided by McCormick Rankin Corp.
2) Ecoplans Site Visit, JANUARY 2006
3) Ecoplans Site Visit, FEBRUARY 2006
4) Ecoplans Survey, MARCH 2006
5) Legal Survey by J.D.Barnes JULY 2004
6) Golder Sketch Map, November 2005

VERTICAL SCALE: 1:500
0m 5 10 15 20

HORIZONTAL SCALE: 1:1000
0m 10 20 30 40

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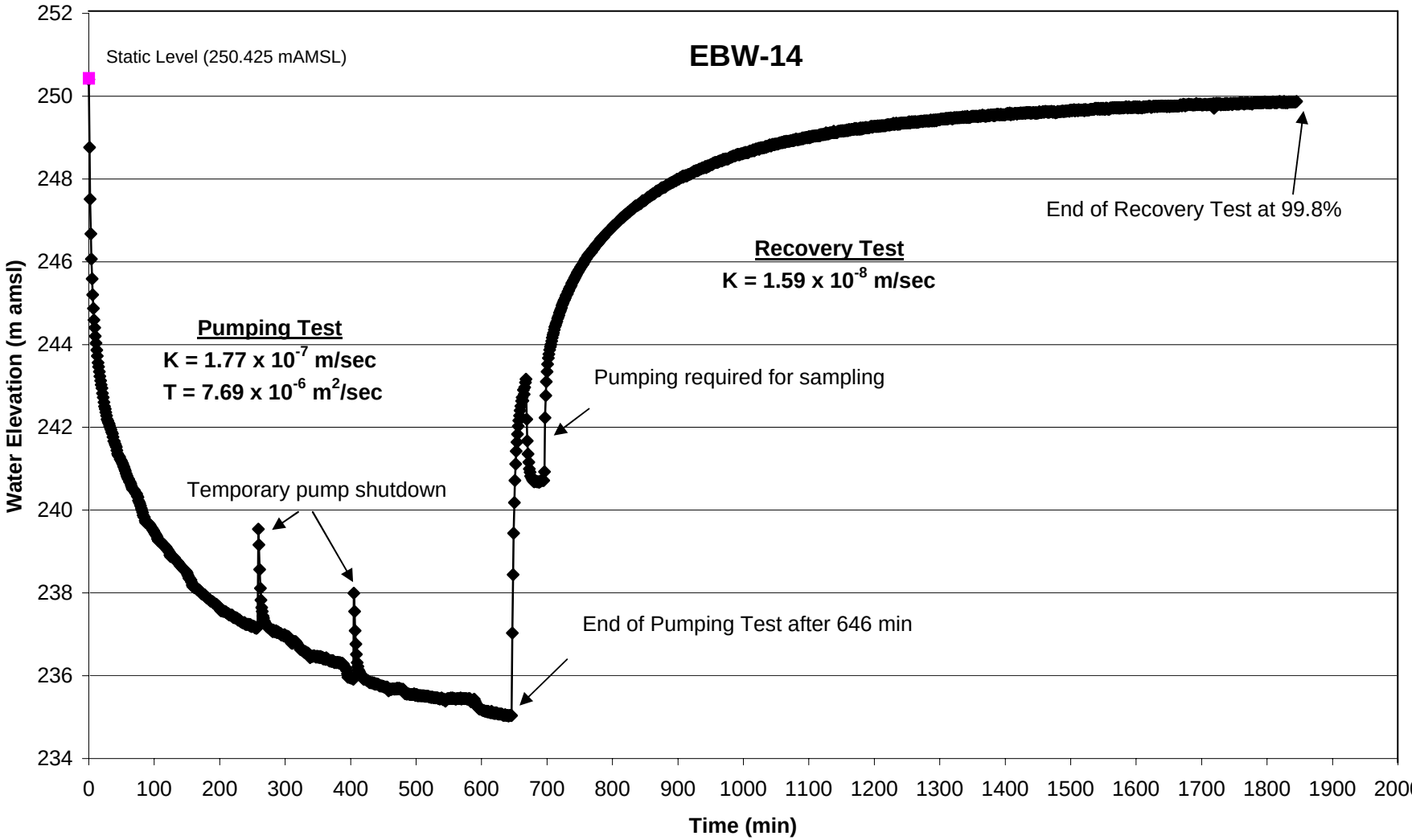
e-mail: ecoplans@ecoplans.com

Drawn By: G. Yang
Checked By.: D. Stewart
Date: April 2007
Project No.: R05-0226
Figure No. 8



ecoplans Limited
Environmental Site Assessment & Remediation

FIGURE 9
EBW-14 DRAWDOWN AND RECOVERY HYDROGRAPH
GRAVENHURST PATROL YARD, MINISTRY OF TRANSPORTATION

TABLES

TABLE 1
Monitoring Well Details
Hydrogeological Investigation - MTO Gravenhurst Patrol Yard
Gravenhurst, Ontario

Monitoring Well ID	Installation Date	Monitoring Well Depth(mTOC)[1]	Screened Interval (mTOC)	Ground Elevation (mAMSL)[2]	Reference Elevation (mAMSL)	Screened Lithology	Hydraulic Conductivity (m/s)
EMW1	May-06	3.12	1.64~3.12	250.31	251.15	fine-grained sand	3.3×10^{-4}
EMW2	May-06	2.75	1.55~2.75	252.95	253.60	gravelly sand	4.4×10^{-2}
EMW3	May-06	13.99	12.49~13.99	254.11	254.70	sandy silt	N.A.[3]
EMW4	May-06	5.40	2.42~5.40	254.13	254.95	fine-grained sand	7.2×10^{-4}
EMW5	May-06	6.00	4.60~6.00	255.06	255.66	sandy silt	3.5×10^{-4}
EMW6	May-06	3.64	1.54~3.64	255.08	255.72	fine-grained sand	9×10^{-4}
EMW7	May-06	5.28	2.83~5.28	254.41	255.69	fine-grained sand	1.3×10^{-3}
EMW8	May-06	4.15	2.65~4.15	254.82	255.77	silt	5.1×10^{-4}
EMW9	May-06	5.08	3.56~5.08	253.49	254.75	medium-grained sand	N.A.
EMW10	May-06	4.86	3.34~4.86	253.15	254.20	medium-grained sand	N.A.
EMW11	May-06	2.80	1.28~2.80	256.67	257.34	fine-grained sand	N.A.
EMW12	Feb-06	2.89	1.37~2.89	252.43	253.19	silt	1.66×10^{-6}
EBW12	Feb-06	61.65	9.53~61.65	252.43	253.12	granitic gneiss	N.A.
EMW13	Feb-06	4.53	1.48~4.53	257.29	258.16	sand and gravel	N.A.
EBW13	Feb-06	61.38	4.23~61.38	257.29	257.72	granitic gneiss	N.A.
EMW14	Feb-06	3.22	1.70~3.22	251.26	252.35	medium-grained sand	4.56×10^{-6}
EBW14	Feb-06	61.49	17.90~61.48	251.28	252.10	granitic gneiss	1.77×10^{-7}

Notes:

(1) mTOC: metre from the top of casing
(2) mAMSL: meter above mean sea level
(3) N.A.: not available

TABLE 2
SAMPLING LOCATIONS AND ANALYTICAL SCHEDULE
Hydrogeological Investigation - MTO Gravenhurst Patrol Yard, Gravenhurst, Ontario

Sample Number	Sampling Date	Analytical Suite									
		TPH (F1-F4/BTEX) (1)	ICP/MS Reg. 153 Metals (2)	pH,SAR (3), EC (4)	Particle Size	Water Content	Group 1 Major Anions (5)	TKN (6), NH3, EC	Group 2 Major Anions (7)	Hardness, TSS (8)	P, TKN, NH3, pH, TOC (9)
GROUNDWATER											
EMW1	28-Feb-06; 09-May-06	√	√				√	√			
EMW2	28-Feb-06; 09-May-06	√	√				√	√			
EMW2	7-Mar-06	√									
EMW3	28-Feb-06; 09-May-06	√	√				√	√			
EMW4	28-Feb-06; 09-May-06	√	√				√	√			
EMW5	01-Mar-06; 10-May-06	√	√				√	√			
EMW6	01-Mar-06; 10-May-06	√	√				√	√			
EMW7	28-Feb-06; 10-May-06	√	√				√	√			
EMW8	28-Feb-06; 10-May-06	√	√				√	√			
EMW9	28-Feb-06; 09-May-06	√	√				√	√			
EMW10	28-Feb-06; 09-May-06	√	√				√	√			
EMW11	01-Mar-06; 10-May-06	√	√				√	√			
EMW12	28-Feb-06; 10-May-06	√	√						√	√	√
EBW12	07-Mar-06; 10-May-06	√	√						√	√	√
EBW13	07-Mar-06; 10-May-06	√	√						√	√	√
EMW14	01-Mar-06; 09-May-06	√	√						√	√	√
EBW14	07-Mar-06; 09-May-06	√	√						√	√	√
SOIL											
EMW12-2	29-Jan-06				√	√					
EMW12-3	29-Jan-06				√	√					
EBW12-2	29-Jan-06				√	√					
EBH12-02	28-Feb-06	√	√	√							
EBH12-04	28-Feb-06	√	√	√							
EMW13-5	24-Jan-06				√	√					
EBW13-2	24-Jan-06				√	√					
EBW13-5	24-Jan-06				√	√					
EBH13-03	27-Feb-06	√	√	√							
EBH13-05	27-Feb-06	√	√	√							
EMW14-3	2-Feb-06				√	√					
EBW14-2	2-Feb-06				√	√					
EBW14-6	2-Feb-06				√	√					
EBH14-05	27-Feb-06	√	√	√							
EBH14-07	27-Feb-06	√	√	√							

Notes:

(1) TPH(F1-F4/BTEX) - Total Petroleum Hydrocarbons and Benzene, Toluene, Ethylbenzene and Xylene (Fractions 1 through 4)
(2) ICP - MS Reg. 153 Metals - Regulation 153 Metals as per the Ontario EPA
(3) SAR - Sodium Absorption Ratio
(4) EC - Electrical Conductivity
(5) Group 1 major anions include the anions of Cl, SO4,PO4,Br, F, NO3, NO2
(6) TKN - Total Kjeldahl Nitrogen
(7) Group 2 major anions includes the anions of Cl, SO4,Br, F, CN, NO3, NO2
(8) TSS - total suspended solids
(9) TOC -total organic compounds

TABLE 3
GROUNDWATER ELEVATIONS
Hydrogeological Investigation - MTO Gravenhurst Patrol Yard, Gravenhurst, Ontario

Monitoring Well ID	Ground Surface Elevation (mAMSL)[1]	Reference Elevation (mAMSL)	27-Feb-06		9-May-06	
			Depth to Groundwater from Ref Elev. (m)	Groundwater Elevation (mAMSL)	Depth to Groundwater from Ref Elev. (m)	Groundwater Elevation (mAMSL)
EMW1	250.31	251.15	1.61	249.54	1.54	249.60
EMW2	252.95	253.60	1.91	251.69	1.55	252.05
EMW3	254.11	254.70	3.32	251.39	2.53	252.17
EMW4	254.13	254.95	3.25	251.70	1.82	253.13
EMW5	255.06	255.66	1.41	254.25	0.96	254.70
EMW6	255.08	255.72	2.12	253.60	1.43	254.29
EMW7	254.41	255.69	3.50	252.19	2.29	253.40
EMW8	254.82	255.77	1.96	253.81	1.74	254.03
EMW9	253.49	254.75	2.41	252.35	1.45	253.31
EMW10	253.15	254.20	2.98	251.22	1.97	252.23
EMW11	256.67	257.34	1.56	255.78	1.46	255.88
EMW12	252.43	253.19	1.25	251.94	1.40	251.80
EBW12	252.43	253.12	1.95	251.18	1.60	251.52
EMW13	257.29	258.16	dry	dry	dry	dry
EBW13	257.29	257.72	5.98	251.74	5.62	252.10
EMW14	251.26	252.35	2.00	250.36	1.69	250.66
EBW14	251.28	252.10	1.24	250.86	1.03	251.08

Notes:

(1) mAMSL: metre above mean sea level

TABLE 4
SOIL ANALYTICAL RESULTS – METALS AND GENERAL CHEMISTRY
Gravenhurst Patrol Yard

Parameter	MOE Soil Standards [1]	Sample Results [2]						
		27-Feb-06						
		EBH12-02	EBH12-04	EBH13-03		EBH13-05	EBH14-07	EBH14-05
	Sampling Intervals (m)	0.8 - 1.5	2.3 - 3.0	1.2 - 1.8		2.4 - 3.0	3.7 - 4.3	2.4 - 3.0
METALS								
Antimony	40	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Arsenic	40	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Barium	1500	31	61.2	46.3	130	9.7	11	8.7
Beryllium	1.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Cadmium	12	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium (Total)	750	7.8	6.1	9.4	11.4	6	2.8	3.1
Cobalt	80	2.6	3	4.9	7.9	1.4	1.3	1.4
Copper	225	14.9	8.4	19.1	26.1	4.9	3.8	4.4
Lead	1000	1.2	1.1	1.8	1.4	0.5	0.5	0.6
Molybdenum	40	<0.5	<0.5	0.9	0.9	1.1	<0.5	<0.5
Nickel	150	8	6.8	12.4	20.4	3.9	3.3	3.2
Selenium	10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Silver	40	<0.4	<0.4	0.9	<0.4	<0.4	<0.4	<0.4
Thallium	32	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vanadium	200	19.9	15.9	22.7	30.5	8.6	8.3	8.1
Zinc	600	13.5	13.6	25	50.5	6.6	6.4	7
Electrical Conductivity (2:1) (mS/cm)	1.4	0.022	0.022	0.048	0.089	0.071	0.015	0.021
Sodium Adsorption Ratio[3]	12	0.153	0.28	0.316	0.308	0.135	0.115	0.059
pH 2:1 Water:Soil Extraction[3]	NV	5.33	5.56	5.58	6.9	7.09	6.37	6.38

Notes:

(1)	MOE Soil Standards, Ontario Regulation 153/04, Table 2 ; Full Depth Generic Site Condition Standards: Potable Groundwater Condition (Industrial/Commercial/Community Property Uses)
(2)	All results reported in micrograms per gram (µg/g) unless otherwise noted.
(3)	Parameter has no unit of measurement
EBH13-03	Sample/Duplicate analysis
<	Parameter not detected above value specified
mS/cm	millisiemens per centimetre
NV	No Value (Parameter not included in MOE Standard)

TABLE 5
SOIL ANALYTICAL RESULTS – PETROLEUM HYDROCARBONS AND BTEX
Gravenhurst Patrol Yard

Parameter	MOE Soil Standards [1]	Sample Results [2]						
		27-Feb-06						
		EBH12-02	EBH12-04	EBH13-03		EBH13-05	EBH14-07	EBH14-05
	Sampling Intervals (m)	0.8 - 1.5	2.3 - 3.0	1.2 - 1.8		2.4 - 3.0	3.7 - 4.3	2.4 - 3.0
PETROLEUM HYDROCARBONS								
F1 (C6-C10)	230	<5	<5	<5	<5	<5	<5	<5
F2 (>C10-C16)	150	<10	<10	<10	<10	<10	<10	<10
F3 (>C16-C34)	1700	<50	<50	<50	<50	<50	<50	<50
F4 (<C34)	3300	<50	<50	<50	<50	<50	<50	<50
BTEX								
Benzene	0.24	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	2.1	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	0.28	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes (Total)	25	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07

Notes:

(1) MOE Soil Standards, Ontario Regulation 153/04, Table 2 ; Full Depth Generic Site Condition Standards: Potable Groundwater Condition (Industrial/Commercial/Community Property Uses)

(2) All results reported in micrograms per gram (µg/g) unless otherwise noted.

EBH13-03 Sample/Duplicate Analysis

< Parameter not detected above value specified

TABLE 6
GROUNDWATER ANALYTICAL RESULTS - METALS
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results [3]							
			EMW1		EMW2		EMW3			
			28-Feb-06	9-May-06	28-Feb-06	9-May-06	28-Feb-06		9-May-06	
METALS										
Aluminum	NV	100(OG)	***171***	***133***	76	75	15.3	15.2	25.2	7.11
Antimony	6	6 (IMAC)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	25	25 (IMAC)	<0.60	<0.60	<0.60	<0.60	0.92	1.01	<0.60	<0.60
Barium	1000	1000 (MAC)	13	18.2	19.2	22.3	30.8	31	24.1	23.2
Beryllium	4	NV	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	NV	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	5000	5000 (IMAC)	25	<10.0	19.7	<10.0	18.3	14.4	14.5	17.5
Cadmium	5	5 (MAC)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	50	50(MAC)	1.5	<1.00	4.03	<1.00	2.34	2.9	<1.00	<1.00
Cobalt	100	NV	8.33	12.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Copper	23	1000 (AO)	4.47	5.8	6.94	5.96	4.44	3.54	5.31	1.6
Iron	NV	300 (AO)	***16300***	***10600***	44.6	34.9	98.1	90.8	60.4	46.8
Lead	10	10(MAC)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese	NV	50 (AO)	***442***	***387***	5.96	6.07	***90.2***	***91.3***	***70***	***71.8***
Molybdenum	7300	NV	<0.50	<0.50	<0.50	<0.50	20.2	19.9	15.8	16
Nickel	100	NV	1.06	<1.00	<1.00	1	7.28	6.83	7.35	6.53
Selenium	10	100(MAC)	<0.80	<0.80	<0.80	<0.80	0.83	<0.80	<0.80	<0.80
Silver	1.2	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium (mg/L)	200	200 (AO)	7.91	1.72	3.08	0.982	58.6	58.3	49.5	50.2
Thallium	2	NV	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	NV	NV	3.5	1.48	1.03	<1.00	3.34	3.32	1.91	1.3
Uranium	NV	20 (MAC)	<0.20	<0.20	<0.20	<0.20	1.01	1	0.36	0.89
Vanadium	200	NV	1.46	0.69	<0.40	<0.40	2.8	2.75	2.68	2.6
Zinc	1100	5000 (AO)	10.6	11.6	11.6	9.99	4.64	4.35	8.04	3.01
Mercury	0.12	1(MAC)	<0.10	-	<0.10	-	<0.10	<0.10	-	-

Notes:

(1) MOE Groundwater Standards, Ontario Regulation 153/04, Table 2; Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (All Types of Property Uses)

(2) Ontario Drinking Water Standards (June 2003)

(3) All results reported in micrograms per litre (µg/L) unless otherwise noted.

< Parameter not detected above value specified

171 Indicates exceedance of ODWS standard.

NV No Value (Parameter not included in MOE/ODWS Standard)

\- Not analyzed

AO Aesthetic objective (non-health related, ie: colour, taste, smell)

OG Operational guideline (water treatment aand distribution)

MAC Maximum acceptable concentration (health related)

EMW3 Sample/Duplicate Analysis

TABLE 6
GROUNDWATER ANALYTICAL RESULTS - METALS
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results [3]							
			EMW4		EMW5		EMW6		EMW7	
			28-Feb-06	9-May-06	1-Mar-06	10-May-06	1-Mar-06	10-May-06	28-Feb-06	10-May-06
METALS										
Aluminum	NV	100(OG)	18	14.5	18	28.4	40	65.2	25	24.3
Antimony	6	6 (IMAC)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	25	25 (IMAC)	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Barium	1000	1000 (MAC)	9.02	7.14	21	19.9	11.7	15.8	6.51	5.9
Beryllium	4	NV	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	NV	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	5000	5000 (IMAC)	12.1	<10.0	11	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium	5	5 (MAC)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	50	50(MAC)	2.69	<1.00	3.04	<1.00	<1.00	<1.00	2.97	<1.00
Cobalt	100	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Copper	23	1000 (AO)	3.34	5.72	2.59	6.28	2.6	6.25	2.14	6.03
Iron	NV	300 (AO)	20	8.88	16.4	12.2	23.7	23.2	16.2	20.5
Lead	10	10(MAC)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese	NV	50 (AO)	5.78	2.91	10.1	9.25	7.99	10.7	11.8	4.76
Molybdenum	7300	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nickel	100	NV	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Selenium	10	100(MAC)	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Silver	1.2	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium (mg/L)	200	200 (AO)	3.72	1.46	2.56	1.33	2.42	1.43	1.52	1.24
Thallium	2	NV	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	NV	NV	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Uranium	NV	20 (MAC)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	200	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Zinc	1100	5000 (AO)	7.82	10.6	6.23	14.1	6.82	15.2	9.37	12.5
Mercury	0.12	1(MAC)	<0.10	-	<0.10	-	<0.10	-	<0.10	-

Notes:

(1) MOE Groundwater Standards, Ontario Regulation 153/04, Table 2; Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (All Types of Property Uses)

(2) Ontario Drinking Water Standards (June 2003)

(3) All results reported in micrograms per litre (µg/L) unless otherwise noted.

< Parameter not detected above value specified

NV No Value (Parameter not included in MOE/ODWS Standard)

\- Not analyzed

AO Aesthetic objective (non-health related, ie: colour, taste, smell)

OG Operational guideline (water treatment aand distribution)

MAC Maximum acceptable concentration (health related)

TABLE 6
GROUNDWATER ANALYTICAL RESULTS - METALS
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results [3]							
			EMW8		EMW9		EMW10		EMW11	
			28-Feb-06	10-May-06	28-Feb-06	9-May-06	28-Feb-06	9-May-06	1-Mar-06	10-May-06
METALS										
Aluminum	NV	100(OG)	***122***	99.9	80.4	***105***	21.5	16.5	***404***	17.1
Antimony	6	6 (IMAC)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	25	25 (IMAC)	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Barium	1000	1000 (MAC)	11.1	15.6	3.27	5.12	7.85	8.38	6.33	9.44
Beryllium	4	NV	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	NV	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	5000	5000 (IMAC)	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	10.5	<10.0
Cadmium	5	5 (MAC)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	50	50(MAC)	3.65	<1.00	3.16	<1.00	2.85	<1.00	3.09	<1.00
Cobalt	100	NV	0.74	0.96	<0.50	<0.50	<0.50	<0.50	1.6	1.38
Copper	23	1000 (AO)	5.31	7.62	2.8	6.99	5.34	5.86	4.42	6.36
Iron	NV	300 (AO)	52.8	22.7	30.8	50.1	20.2	14.6	141	21.9
Lead	10	10(MAC)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese	NV	50 (AO)	13	13	7.34	9.16	14.2	18.5	***87.9***	30.6
Molybdenum	7300	NV	<0.50	<0.50	0.85	0.81	<0.50	<0.50	1.27	<0.50
Nickel	100	NV	<1.00	1.17	<1.00	<1.00	<1.00	<1.00	1.89	1.13
Selenium	10	100(MAC)	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Silver	1.2	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium (mg/L)	200	200 (AO)	3.79	1.12	14.6	6.12	2.14	1.15	6.76	1.5
Thallium	2	NV	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	NV	NV	1.59	<1.00	1.07	1.53	<1.00	<1.00	8.42	<1.00
Uranium	NV	20 (MAC)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	200	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Zinc	1100	5000 (AO)	13.4	20.9	7.7	11.9	13.4	15.6	4.4	12.8
Mercury	0.12	1(MAC)	<0.10	-	<0.10	-	<0.10	-	<0.10	-

Notes:

(1) MOE Groundwater Standards, Ontario Regulation 153/04, Table 2; Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (All Types of Property Uses)

(2) Ontario Drinking Water Standards (June 2003)

(3) All results reported in micrograms per litre (µg/L) unless otherwise noted.

< Parameter not detected above value specified

122 Indicates exceedance of ODWS standard.

NV No Value (Parameter not included in MOE/ODWS Standard)

\- Not analyzed

AO Aesthetic objective (non-health related, ie: colour, taste, smell)

OG Operational guideline (water treatment aand distribution)

MAC Maximum acceptable concentration (health related)

TABLE 6
GROUNDWATER ANALYTICAL RESULTS - METALS
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results [3]							
			EMW12				EBW12		EBW13	
			28-Feb-06		10-May-06		7-Mar-06	10-May-06	7-Mar-06	10-Mar-06
METALS										
Aluminum	NV	100(OG)	16.7	19.8	26.1	28	87.3	34.9	40.6	3.41
Antimony	6	6 (IMAC)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	25	25 (IMAC)	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Barium	1000	1000 (MAC)	24.2	24.8	25.3	25.8	8.06	7.1	85.9	89
Beryllium	4	NV	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	NV	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	5000	5000 (IMAC)	<10.0	<10.0	<10.0	<10.0	165	207	132	152
Cadmium	5	5 (MAC)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	50	50(MAC)	2.98	3.09	<1.00	<1.00	3.36	<1.00	<1.00	<1.00
Cobalt	100	NV	1.44	1.43	1.15	1.15	<0.50	<0.50	<0.50	<0.50
Copper	23	1000 (AO)	3.01	3.45	2.36	3.86	19.7	0.96	0.87	1.39
Iron	NV	300 (AO)	25.4	29.9	21.7	22	93.3	32.1	133	45.6
Lead	10	10(MAC)	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	<0.50
Manganese	NV	50 (AO)	***104***	***105***	45.8	46.8	4.7	4.56	34.2	41.6
Molybdenum	7300	NV	63.1	66.1	12.9	12.9	191	183	36.7	8.65
Nickel	100	NV	7.92	8.13	4.77	4.81	1.24	1.13	1.19	<1.00
Selenium	10	100(MAC)	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Silver	1.2	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium (mg/L)	200	200 (AO)	3.68	3.76	9.1	9.07	44.3	49.2	26	24.5
Thallium	2	NV	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	NV	NV	<1.00	<1.00	<1.00	<1.00	6.43	1.27	3.02	<1.00
Uranium	NV	20 (MAC)	<0.20	<0.20	<0.20	<0.20	0.74	0.53	<0.20	0.22
Vanadium	200	NV	<0.40	<0.40	<0.40	<0.40	2.94	2.02	1.13	0.64
Zinc	1100	5000 (AO)	6.28	7.68	7.38	18.2	6.39	1.87	<1.00	1.66
Mercury	0.12	1(MAC)	<0.10	<0.10	-	-	<0.10	-	-	-

Notes:

(1)	MOE Groundwater Standards, Ontario Regulation 153/04, Table 2; Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (All Types of Property Uses)
(2)	Ontario Drinking Water Standards (June 2003)
(3)	All results reported in micrograms per litre (µg/L) unless otherwise noted.
<	Parameter not detected above value specified
104	Indicates exceedance of ODWS standard.

NV	No Value (Parameter not included in MOE/ODWS Standard)
-	Not analyzed
AO	Aesthetic objective (non-health related, ie: colour, taste, smell)
OG	Operational guideline (water treatment aand distribution)
MAC	Maximum acceptable concentration (health related)
EMW12	Sample/Duplicate Analysis

TABLE 6
GROUNDWATER ANALYTICAL RESULTS - METALS
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results [3]					
			EMW14		EBW14		Field Blank	
			1-Mar-06	9-May-06	7-Mar-06	9-May-06	28-Feb-06	9-May-06
METALS								
Aluminum	NV	100(OG)	26	22.8	10.4	9.65	1.19	7.49
Antimony	6	6 (IMAC)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	25	25 (IMAC)	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Barium	1000	1000 (MAC)	15.9	13.1	147	131	<0.50	<0.50
Beryllium	4	NV	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	NV	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	5000	5000 (IMAC)	<10.0	10.6	53.7	51.6	<10.0	<10.0
Cadmium	5	5 (MAC)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	50	50(MAC)	2.93	<1.00	2.09	<1.00	2.72	<1.00
Cobalt	100	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Copper	23	1000 (AO)	3.15	5.76	1.27	1.05	<0.80	<0.80
Iron	NV	300 (AO)	28.9	20.1	129	45.5	<2.00	2.85
Lead	10	10(MAC)	<0.50	<0.50	2.33	<0.50	<0.50	<0.50
Manganese	NV	50 (AO)	48.2	26.9	23.4	13.9	<0.60	<0.60
Molybdenum	7300	NV	<0.50	<0.50	5.88	4.13	<0.50	<0.50
Nickel	100	NV	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Selenium	10	100(MAC)	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Silver	1.2	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium (mg/L)	200	200 (AO)	0.984	1.15	0.0133	14.9	0.304	0.157
Thallium	2	NV	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	NV	NV	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Uranium	NV	20 (MAC)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	200	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Zinc	1100	5000 (AO)	11.8	15	23.6	3.24	<1.00	<1.00
Mercury	0.12	1(MAC)	<0.10	-	<0.10	-	<0.10	-

Notes:

(1) MOE Groundwater Standards, Ontario Regulation 153/04, Table 2; Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (All Types of Property Uses)

(2) Ontario Drinking Water Standards (June 2003)

(3) All results reported in micrograms per litre (µg/L) unless otherwise noted.

< Parameter not detected above value specified

NV No Value (Parameter not included in MOE/ODWS Standard)

\- Not analyzed

AO Aesthetic objective (non-health related, ie: colour, taste, smell)

OG Operational guideline (water treatment aand distribution)

MAC Maximum acceptable concentration (health related)

IMAC Interim maximum acceptable concentration (health related)

TABLE 7
GROUNDWATER ANALYTICAL RESULTS - PETROLEUM HYDROCARBON FRACTIONS AND BTEX
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results [3]							
			EMW1		EMW2		EMW3			
			28-Feb-06	9-May-06	28-Feb-06	9-May-06	28-Feb-06		9-May-06	
PETROLEUM HYDROCARBONS										
F1 (6<C<10)	1000	NV	<100	<100	<100	<100	<100	<100	<100	<100
F2 (10<C<16)										
F3 (16<C<34)	1000	NV	<500	<500	-	<500	<500	<500	<500	<500
F4 (34<C<50)										
BTEX										
Benzene	5	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	24	24 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	2.4	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	300	300 (AO)	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results							
			EMW4		EMW5		EMW6		EMW7	
			28-Feb-06	9-May-06	1-Mar-06	10-May-06	1-Mar-06	10-May-06	28-Feb-06	10-May-06
PETROLEUM HYDROCARBONS										
F1 (6<C<10)	1000	NV	<100	<100	<100	<100	<100	<100	<100	<100
F2 (10<C<16)										
F3 (16<C<34)	1000	NV	<500	<500	<500	<500	<500	<500	<500	<500
F4 (34<C<50)										
BTEX										
Benzene	5	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	24	24 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	2.4	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	300	300 (AO)	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14

Notes:

(1) MOE Groundwater Standards, Ontario Regulation 153/04, Table 2; Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (All Types of Property Uses)

(2) Ontario Drinking Water Standards (June 2003)

(3) micrograms per litre (µg/L)

< Parameter not detected above value specified

NV No Value (Parameter not included in MOE/ODWS Standard)

\- Not analyzed

AO Aesthetic objective (non-health related, ie: colour, taste, smell)

MAC Maximum acceptable concentration (health related)

EMW3 Sample/Duplicate Analysis

TABLE 7
GROUNDWATER ANALYTICAL RESULTS - PETROLEUM HYDROCARBON FRACTIONS AND BTEX
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results [3]							
			EMW8		EMW9		EMW10		EMW11	
			28-Feb-06	10-May-06	28-Feb-06	9-May-06	28-Feb-06	9-May-06	1-Mar-06	10-May-06
PETROLEUM HYDROCARBONS										
F1 (6<C<10)	1000	NV	<100	<100	<100	<100	<100	<100	<100	<100
F2 (10<C<16)										
F3 (16<C<34)	1000	NV	<500	<500	<500	<500	<500	<500	<500	<500
F4 (34<C<50)										
BTEX										
Benzene	5	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	24	24 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	2.4	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	300	300 (AO)	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results							
			EMW12				EBW12		EBW13	
			28-Feb-06		10-May-06		7-Mar-06	10-May-06	7-Mar-06	10-May-06
PETROLEUM HYDROCARBONS										
F1 (6<C<10)	1000	NV	<100	<100	<100	<100	<100	<100	<100	<100
F2 (10<C<16)										
F3 (16<C<34)	1000	NV	<500	<500	<500	<500	<500	<500	<500	<500
F4 (34<C<50)										
BTEX										
Benzene	5	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	24	24 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	2.4	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	300	300 (AO)	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14

Notes:

(1) MOE Groundwater Standards, Ontario Regulation 153/04, Table 2; Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (All Types of Property Uses)

(2) Ontario Drinking Water Standards (June 2003)

(3) micrograms per litre (µg/L)

< Parameter not detected above value specified

NV No Value (Parameter not included in MOE/ODWS Standard)

\- Not analyzed

AO Aesthetic objective (non-health related, ie: colour, taste, smell)

MAC Maximum acceptable concentration (health related)

EMW12 Sample/Duplicate Analysis

TABLE 7
GROUNDWATER ANALYTICAL RESULTS - PETROLEUM HYDROCARBON FRACTIONS AND BTEX
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Sample Results [3]					
			EMW14		EBW14		Field Blank	
			1-Mar-06	9-May-06	7-Mar-06	9-May-06	28-Feb-06	9-May-06
PETROLEUM HYDROCARBONS								
F1 (6<C<10)	1000	NV	<100	<100	<100	<100	<100	<100
F2 (10<C<16)								
F3 (16<C<34)	1000	NV	<500	<500	<500	<500	<500	<500
F4 (34<C<50)								
BTEX								
Benzene	5	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	24	24 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	2.4	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	300	300 (AO)	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14

Notes:

(1) MOE Groundwater Standards, Ontario Regulation 153/04, Table 2; Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (All Types of Property Uses)
(2) Ontario Drinking Water Standards (June 2003)
(3) micrograms per litre (µg/L)
< Parameter not detected above value specified

NV No Value (Parameter not included in MOE/ODWS Standard)
- Not analyzed
AO Aesthetic objective (non-health related, ie: colour, taste, smell)
MAC Maximum acceptable concentration (health related)

TABLE 8
GROUNDWATER ANALYTICAL RESULTS - GENERAL GROUNDWATER CHEMISTRY
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Unit	Sample Results							
				EMW1		EMW2		EMW3			
				28-Feb-06	9-May-06	28-Feb-06	9-May-06	28-Feb-06		9-May-06	
Electrical Conductivity	NV	NV	uS/cm	41	42	40	32	435	429	351	368
Fluoride	NV	1.5 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	0.09	0.08	0.20	0.20
Chloride	250.0	250 (AO)	mg/L	1.66	1.45	1.14	0.87	4.69	4.73	3.72	3.91
Bromide	NV	NV	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	10	10 (MAC)	mg/L	<0.05	<0.05	<0.05	0.07	0.55	0.54	0.36	0.29
Nitrite as N	1	1 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	NV	NV	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	NV	500(AO)	mg/L	7.23	6.04	13.60	8.18	129.00	131.00	105.00	107.00
Ammonia as N	NV	NV	mg/L	0.08	0.14	<0.02	<0.02	<0.02	<0.02	0.06	0.14
Total Kjeldahl Nitrogen	NV	NV	mg/L	2.34	0.59	1.28	1.93	0.19	0.25	0.18	0.19

Notes:

(1)	MOE Groundwater Standards, Ontario Regulation153/04, Table 2; Full-depth Generic Site Conditions in a Potable Ground Water Condition (All Types of Property Uses)
(2)	Ontario Drinking Water Standards (June 2003)
MAC	Maximum acceptable concentration (health-related)
IMAC	Interim maximum acceptable concentration (health-related)
AO	Aesthetic objective (non-health related, i.e. colour, taste, smell)
NV	No Value (Parameter not included in MOE Standard)
<	Parameter not detected above value specified
mg/L	Milligrams per litre
uS/cm	micro Siemens per centimeter
EMW3	Sample/Duplicate analysis

TABLE 8
GROUNDWATER ANALYTICAL RESULTS - GENERAL GROUNDWATER CHEMISTRY
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Unit	Sample Results							
				EMW8		EMW9		EMW10		EMW11	
				28-Feb-06	10-May-06	28-Feb-06	9-May-06	28-Feb-06	9-May-06	1-Mar-06	10-May-06
Electrical Conductivity	NV	NV	uS/cm	29	24	55	46	27	26	72	41
Fluoride	NV	1.5 (MAC)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	250.000	250 (AO)	mg/L	1.14	1.01	1.23	1.16	1.20	0.93	1.60	1.38
Bromide	NV	NV	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	10	10 (MAC)	mg/L	0.13	<0.05	<0.05	<0.05	<0.05	0.23	<0.05	<0.05
Nitrite as N	1	1 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	NV	NV	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	NV	500(AO)	mg/L	8.37	5.40	9.64	10.40	5.79	6.03	17.70	6.81
Ammonia as N	NV	NV	mg/L	<0.02	0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	NV	NV	mg/L	1.77	1.88	1.25	0.60	0.24	0.15	0.72	0.30

Notes:

(1)	MOE Groundwater Standards, Ontario Regulation153/04, Table 2; Full-depth Generic Site Conditions in a Potable Ground Water Condition (All Types of Property Uses)
(2)	Ontario Drinking Water Standards (June 2003)
MAC	Maximum acceptable concentration (health-related)
IMAC	Interim maximum acceptable concentration (health-related)
AO	Aesthetic objective (non-health related, i.e. colour, taste, smell)
NV	No Value (Parameter not included in MOE Standard)
<	Parameter not detected above value specified
mg/L	Milligrams per litre
uS/cm	micro Siemens per centimeter

TABLE 8
GROUNDWATER ANALYTICAL RESULTS - GENERAL GROUNDWATER CHEMISTRY
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Unit	Sample Results							
				EMW4		EMW5		EMW6		EMW7	
				28-Feb-06	9-May-06	1-Mar-06	10-May-06	1-Mar-06	10-May-06	28-Feb-06	10-May-06
Electrical Conductivity	NV	NV	uS/cm	24	23	31	32	29	27	24	22
Fluoride	NV	1.5 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	250.0	250 (AO)	mg/L	0.97	1.44	1.31	1.34	1.51	1.28	1.08	1.05
Bromide	NV	NV	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	10	10 (MAC)	mg/L	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	1	1 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	NV	NV	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	NV	500(AO)	mg/L	5.55	4.04	6.14	6.59	5.81	5.53	5.61	5.20
Ammonia as N	NV	NV	mg/L	<0.02	0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.02
Total Kjeldahl Nitrogen	NV	NV	mg/L	0.70	0.69	0.37	0.31	0.46	0.29	0.65	0.36

Notes:

(1)	MOE Groundwater Standards, Ontario Regulation153/04, Table 2; Full-depth Generic Site Conditions in a Potable Ground Water Condition (All Types of Property Uses)
(2)	Ontario Drinking Water Standards (June 2003)
MAC	Maximum acceptable concentration (health-related)
IMAC	Interim maximum acceptable concentration (health-related)
AO	Aesthetic objective (non-health related, i.e. colour, taste, smell)
NV	No Value (Parameter not included in MOE Standard)
<	Parameter not detected above value specified
mg/L	Milligrams per litre
uS/cm	micro Siemens per centimeter

TABLE 8
GROUNDWATER ANALYTICAL RESULTS - GENERAL GROUNDWATER CHEMISTRY
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Unit	Sample Results							
				EMW12				EBW12		EBW13	
				28-Feb-06		10-May-06		7-Mar-06	10-May-06	7-Mar-06	10-May-06
Electrical Conductivity	NV	NV	uS/cm	59	60	-	-	-	-	-	-
Fluoride	NV	1.5 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	0.38	0.50	0.37	0.44
Chloride	250.0	250 (AO)	mg/L	3.05	3.08	1.85	1.84	2.44	2.28	2.50	6.92
Bromide	NV	NV	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	10	10 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	1	1 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	NV	NV	mg/L	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	NV	500(AO)	mg/L	9.18	9.24	20.60	20.40	13.70	14.50	11.00	11.00
Ammonia as N	NV	NV	mg/L	<0.02	<0.02	0.07	0.02	0.11	0.04	0.06	0.02
Total Kjeldahl Nitrogen	NV	NV	mg/L	2.64	2.49	0.94	1.14	0.13	0.13	<0.10	0.11
Total Phosphorus	NV	NV	mg/L	45.40	54.40	4.70	4.76	<0.05	<0.05	<0.05	<0.05
Total Organic Carbon	NV	NV	mg/L	100.00	113.00	29.00	43.00	1.00	1.00	1.00	<1
Cyanide	0.052	0.2 (MAC)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
pH	NV	6.5-8.5 (OG)	N/A	6.51	6.53	7.51	7.22	***8.85***	***8.93***	8.12	8.08
Total Hardness	NV	80-100 (OG)	mg/L	***19.90***	***20.00***	***17.30***	***18.00***	***20.90***	***21.20***	***52.00***	***55.50***
Total Suspended Solids	NV	NV	mg/L	6160.00	12200.00	5640.00	12400.00	27.00	22.00	<12	<12

Notes:

(1)	MOE Groundwater Standards, Ontario Regulation153/04, Table 2; Full-depth Generic Site Conditions in a Potable Ground Water Condition (All Types of Property Uses)
(2)	Ontario Drinking Water Standards (June 2003)
MAC	Maximum acceptable concentration (health related)
IMAC	Interim maximum acceptable concentration (health related)
AO	Aesthetic objective (non-health related, i.e. colour, taste, smell)
OG	Operational guideline9water treatment aand distribution)
NV	No Value (Parameter not included in MOE Standard)
<	Parameter not detected above value specified
mg/L	Milligrams per litre
uS/cm	micro Siemens per centimeter
-	Not analyzed
8.85	Indicates exceedance of ODWS
EMW12	Sample/Duplicate analysis

TABLE 8
GROUNDWATER ANALYTICAL RESULTS - GENERAL GROUNDWATER CHEMISTRY
Gravenhurst Patrol Yard

Parameter	MOE Groundwater Standards [1]	ODWS [2]	Unit	Sample Results					
				EMW14		EBW14		Field Blank	
				1-Mar-06	9-May-06	7-Mar-06	9-May-06	28-Feb-06	9-May-06
Electrical Conductivity	NV	NV	uS/cm	26	-	-	-	2	<2
Fluoride	NV	1.5 (MAC)	mg/L	<0.05	<0.05	0.07	0.13	<0.05	<0.05
Chloride	250.0	250 (AO)	mg/L	0.92	0.82	1.17	1.03	<0.10	<0.10
Bromide	NV	NV	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	10	10 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	1	1 (MAC)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	NV	NV	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	NV	500(AO)	mg/L	4.93	5.62	20.00	19.40	<0.10	<0.10
Ammonia as N	NV	NV	mg/L	<0.02	<0.02	0.13	0.07	<0.02	<0.02
Total Kjeldahl Nitrogen	NV	NV	mg/L	<0.10	0.14	<0.10	0.17	<0.10	<0.10
Total Phosphorus	NV	NV	mg/L	0.23	0.20	<0.05	<0.05	-	-
Total Organic Carbon	NV	NV	mg/L	2.00	6.00	<1	<1	-	-
Cyanide	0.052	0.2 (MAC)	mg/L	<0.002	<0.002	-	<0.002	-	-
pH	NV	6.5-8.5 (OG)	N/A	***6.01***	6.78	8.30	8.26	-	-
Total Hardness	NV	80-100 (OG)	mg/L	***8.74***	***8.90***	***61.20***	***50.60***	-	-
Total Suspended Solids	NV	NV	mg/L	55.00	174.00	<12	<12	-	-

Notes:

(1)	MOE Groundwater Standards, Ontario Regulation153/04, Table 2; Full-depth Generic Site Conditions in a Potable Ground Water Condition (All Types of Property Uses)
(2)	Ontario Drinking Water Standards (June 2003)
MAC	Maximum acceptable concentration (health related)
IMAC	Interim maximum acceptable concentration (health related)
AO	Aesthetic objective (non-health related, i.e. colour, taste, smell)
OG	Operational guideline9water treatment aand distribution)
NV	No Value (Parameter not included in MOE Standard)
<	Parameter not detected above value specified
mg/L	Milligrams per litre
uS/cm	micro Siemens per centimeter
-	Not analyzed
6.01	Indicates exceedance of ODWS

TABLE 9
WATER BALANCE ANALYSIS
Gravenhurst Patrol Yard

Description	Jan ,Feb ,Mar	Apr ,May ,Jun	Jul ,Aug ,Sep	Oct ,Nov ,Dec	Annual
Existing Conditions (Area 5.38 ha)					
Total Precipitation (mm)	236	256	292	316	1,099
(m^3)	12,670	13,746	15,710	16,990	59,115
Evapotranspiration (mm)	0	207	295	37	540
(m^3)	0	11,156	15,867	2,015	29,038
Difference (Water Balance) (mm)	236	48	-3	278	558
(m^3)	12,670	2,590	-158	14,975	30,077
Future Conditions (Area 5.16 ha)					
Total Precipitation (mm)	236	256	292	316	1,099
(m^3)	12,152	13,184	15,067	16,295	56,698
Evapotranspiration					
Land Area (m^3)	0	7,165	10,122	1,296	18,583
Roof Area (m^3)	0	257	424	49	730
Paved Area (m^3)	0	1,476	2,435	284	4,195
Total Evapotranspiration (m^3)	0	8,898	12,981	1,639	23,508
(mm)	0	172	252	32	456
Difference (Water Balance) (mm)	236	83	40	284	643
(m^3)	12,152	4,286	2,087	14,666	33,190
Water Balance Change (Based on Future Area 5.16 ha)					
Change from Existing (mm)	-10	33	43	-6	60
(m^3)	-518	1,696	2,244	-309	3,113

APPENDIX A

SITE PHOTOGRAPHS

Photograph #1
General view of the typical landscape of the area noting the large wetland in the photo background. Site is located to the left of the photo. Photo taken facing northeast.

Photograph #2
View of the large wetland located southeast of the site. Photo taken facing east.

Photograph #3
View of the small pond located at the southeast corner of the site. Photo taken facing east.

ecoplans Limited
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Hydrogeological Investigation
MTO Gravenhurst Patrol Yard, Gravenhurst, Ontario
SITE PHOTOGRAPHS

Date: Apr. 2007
Project No.: R05-0226
Figure No. A-1

Photograph #4
General view of the typical landscape of the site noting a bedrock ridge in the photo foreground and the relatively flat land between ridges. Photo taken facing north.

Photograph #5
View of a typical bedrock ridge in the area. (immediately southeast of the site). Photo taken facing southeast.

Photograph #6
View of one of the many small roads/laneways running through the site. Photo taken facing northwest.

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Hydrogeological Investigation
MTO Gravenhurst Patrol Yard, Gravenhurst, Ontario
SITE PHOTOGRAPHS

Date: Apr. 2007
Project No.: R05-0226
Figure No. A-2

Photograph #7
General view of a bedrock ridge/knoll located at the central portion of the site. Photo taken facing southwest.

Photograph #8
View of the large borrow pit located to the west of the site. Photo taken facing southwest.

Photograph #9
View of a small picnic area at the north central portion of the site. Photo taken facing east

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SITE PHOTOGRAPHS

Date: Apr. 2007
Project No.: R05-0226
Figure No. A-3

Photograph #10
View of old Monitoring Wells EMW3 and EMW4.
Photo taken facing northwest.

Photograph #11
View of new Monitoring Well EMW9.
Photo taken facing south.

Photograph #12
View of Mini-piezometer P2 located in large wetland. Photo taken facing east

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MTO Gravenhurst Patrol Yard, Gravenhurst, Ontario
SITE PHOTOGRAPHS

Date: Apr. 2007
Project No.: R05-0226
Figure No. A-4

Photograph #13
View of drilling/coring for Well EBW12.
Photo taken facing northeast.

Photograph #14
View of core and fissures in the core
taken from 19.2m to 21.3m of Well EBW 14.

Photograph #15
View of core and fissures in the core
taken from 56.4m to 58.5m of Well EBW 13.

Photograph #16
View of core and fissures in the core between 41.7m and 43.2m taken from Well EBW12.

Photograph #17
Mini-piezometer in the small on-site pond. Photo taken facing north.

Photograph #18
View of nest wells(EMW12 and EBW12) and preparation for pumping.
Photo taken facing north.

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MTO Gravenhurst Patrol Yard, Gravenhurst, Ontario
SITE PHOTOGRAPHS

Date: Apr. 2007
Project No.: R05-0226
Figure No. A-6

APPENDIX B

BOREHOLE LOGS

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EMW9

Sheet: 1 of 1

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,282 N, 629,541.7 E
Borehole Type: Hollow Stem Augers
Date: January 23, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Checked By: D. Stewart

Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
253.5	Ground Surface									
0.0	**SAND** Brown to grey, coarse, organic matter, loose to compact		1	SS	14	<1		May 9/06		
			2	SS	23	<1		Feb. 28/06		
252.4 / 1.1	-becoming grey brown, compact, moist									
252.0 / 1.5	**SAND** Grey brown, medium textured, compact, wet		3	SS	28	<1				
			4	SS	16	<1				
250.9 / 2.6	- becoming grey, loose to compact, wet		5	SS	13	<1				
249.7 / 3.8	End of Borehole									

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Log of Borehole: EMW10

Sheet: 1 of 1

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,298.1 N, 629,666.1 E
Borehole Type: Hollow Stem Augers
Date: January 23, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
253.2	Ground Surface									
0.0	**SAND** Dark brown, medium textured, rootlets, stones and pebbles, loose		1	SS	3	<1				
			2	SS	33	<1		May 9/06		
252.1 1.1	- becoming grey brown, medium to coarse textured, compact to dense									
251.8 1.4	- becoming grey, compact, moist		3	SS	18	<1		Feb. 28/06		
			4	SS	18	<1				
250.1 3.0	**SAND** Grey, fine textured, compact, wet		5	SS	23	<1				
249.3 3.8	End of Borehole									

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Log of Borehole: EMW11

Sheet: 1 of 1

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,512 N, 629,524 E
Borehole Type: Hollow Stem Augers
Date: January 28, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
256.7	Ground Surface									
0.0	**PEAT** Brown, rooted wood and plants, loose		1	SS	6	<1 ▲				
255.9								May 9/06 ▼ Feb. 28/06		
0.8	**SAND** Grey, medium to fine textured, compact to dense, wet		2	SS	27	<1 ▲				
255.2										
1.5	**Silty SAND** Grey, dense		3	SS	40	<1 ▲				
254.7										
2.0	**SAND** Coarse. Auger refusal at 2.13 m									
	End of Borehole									

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Log of Borehole: EBH12

Sheet: 1 of 1

WP: 5420-02-00
Co-ordinates: Not Available
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Pionjar
Compiled By: K. Pumphrey
Datum: Geodetic
Date: February 28, 2006
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
	Ground Surface									
0.0	**SAND** Grey brown, fine, organic matter		1	SS		2.3				
			2	SS		1.0				
1.5	**SILT** Grey, wet		3	SS		1.0				
			4	SS		1.1				
			5	SS		<1				
3.8	End of Borehole									

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Log of Borehole: EMW12

Sheet: 1 of 1

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,503 N, 629,638 E
Borehole Type: Hollow Stem Augers
Date: January 29, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
252.4	Ground Surface									
0.0	**SAND** Brown, fine, with some peat and rootlets, pebbles and stones, loose		1	SS	2	<1		Feb. 28/06 ▽ May 9/06		
			2	SS	25	<1			●	0.1 18.6 77.5 3.8
251.4 1.1	-becoming grey, fine to very fine sand, mottled, loose to compact, wet		3	SS	16	<1			●	0 7.2 89.9 2.9
			4	SS	13	<1				
249.5 2.9	End of Borehole									

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Log of Borehole: EBW12

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic

Co-ordinates: 4,973,694.6 N, 316,016.3 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: January 29 to February 1, 2006

Originated By: B. Guan
Compiled By: K. Pumphrey
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
252.4	Ground Surface									
0.0	**Sandy SILT** Grey brown, moist to wet							May 9/06 Feb. 28/06		
249.4 3.0	- becoming grey		1	SS	15	<1				
			2	SS	29	<1				
			3	SS	0	<1				0 13.7 82.8 3.5

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Environmental Site Assessment and Remediation

Log of Borehole: EBW12

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,694.6 N, 316,016.3 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: January 29 to February 1, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
244.9										
7.5	**Gneiss BOULDERS** Sand and silt									
243.6										
8.8	**Granitic GNEISS** Dark grey when wet									

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Log of Borehole: EBW12

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,694.6 N, 316,016.3 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: January 29 to February 1, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE						Moisture Content (%)	Grain Size Distribution (%)
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	20 40 60	GR SA SI CL
236.6 15.8	- vertical water bearing fissure between 15.8 and 16.15 m									
234.8 17.7	- becoming solid rock, massive									
231.7 20.7	- becoming fractured									
231.4 21.0										

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Log of Borehole: EBW12

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,694.6 N, 316,016.3 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: January 29 to February 1, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
	- vertical fissure containing sediments at 21.03 to 21.95 m									
225.2 / 27.3	- water bearing fissure at 27.28 m									

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Environmental Site Assessment and Remediation

Log of Borehole: EBW12

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,694.6 N, 316,016.3 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: January 29 to February 1, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
222.6 29.9	-banded granitc gneiss, fissures occuring between 32.31 and 33.38 m									

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Environmental Site Assessment and Remediation

Log of Borehole: EBW12

WP: 5420-02-00
Co-ordinates: 4,973,694.6 N, 316,016.3 E
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Hollow Stem/NQ Diamond Coring
Compiled By: K. Pumphrey
Datum: Geodetic
Date: January 29 to February 1, 2006
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
216.5 36.0	- granitic gneiss, massive									
211.6 40.8	- banded granitic gneiss									

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Environmental Site Assessment and Remediation

Log of Borehole: EBW12

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,694.6 N, 316,016.3 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: January 29 to February 1, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
210.1 42.4	- fissure containing sediments on the fissure surface									
209.8 42.7	- fractured granitic gneiss									
207.2 45.3	- fissure at 45.26 m									
204.7 47.7	- water bearing fissure at 47.70 m									

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Environmental Site Assessment and Remediation

Log of Borehole: EBW12

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,694.6 N, 316,016.3 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: January 29 to February 1, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
202.4 50.0	- solid granitic gneiss									

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Log of Borehole: EBW12

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,694.6 N, 316,016.3 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: January 29 to February 1, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE						Moisture Content (%)	Grain Size Distribution (%)
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	20 40 60	GR SA SI CL
194.5 / 57.9	- banded granitic gneiss									
192.5 / 60.0	- fracture at 59.95 m									
191.5 / 61.0	End of Borehole									

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Environmental Site Assessment and Remediation

Log of Borehole: EBH13

Sheet: 1 of 1

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic

Co-ordinates: Not Available
Borehole Type: Geoprobe Direct Push System
Date: February 27, 2006

Originated By: B. Guan
Compiled By: K. Pumphrey
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
	Ground Surface									
0.0	**TOPSOIL** Dark brown, silty, rotted wood and plants		1	DT		3.3				
			2	DT		1.2				
1.4	**SAND** Grey, coarse textured with some gravel		3	DT		5.2				
			4	DT		2.5				
			5	DT		1.1				
3.0	-becoming very coarse		6	DT		1.6				
			7	DT		1.0				
4.9	End of Borehole									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EMW13

Sheet: 1 of 1

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,379.4 N, 629,499.1 E
Borehole Type: Hollow Stem Augers
Date: January 24, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
257.3	Ground Surface									
0.0	**SAND** Brown to dark brown, fine textured, rotted wood and plants at surface, loose to compact		1	SS	10	<1 ▲		Feb 28/06 Dry		
256.7										
0.6	**Sandy SILT** Grey, compact to dense		2	SS	18	<1 ▲		May 9/06 Dry		
256.1										
1.2	**SAND** Grey, coarse, with some pebbles and gravels, dense		3	SS	37	<1 ▲				
			4	SS	60	<1 ▲			●	45.6 48.6 5.8
254.2										
3.0	**GRAVEL** Grey with large stones. Auger refusal at 3.7 m		5	SS	127					
253.6										
3.7	End of Borehole									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

Sheet: 1 of 9

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,382N, 629,496 E
Borehole Type: Hollow Stem/ NQ Diamond Coring
Date: January 24 to January 28, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
257.3	Ground Surface									
0.0	**SAND** Brown, fine textured, rooted wood and plants at surface, loose		1	SS	3	<1 ▲				
256.5										
0.8	**Silty SAND** Compact, moist to wet		2	SS	14	<1 ▲				3.4 28.3 65.3 3
256.1										
1.2	**SAND** Coarse, compact									
255.8										
1.5	**COBBLES** Cobbles, pebbles with some sand, dense		3	SS	29	<1 ▲				
			4	SS	70	<1 ▲				
			5	SS	159	<1 ▲				
253.5										
3.8	**Granitic GNEISS** Dark grey when wet, full recovery							May 9/06 ▼ Feb. 28/06 ▼		
251.0										
6.3	- open fissure at 6.28 m									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic

Co-ordinates: 4,973,382N, 629,496 E
Borehole Type: Hollow Stem/ NQ Diamond Coring
Date: January 24 to January 28, 2006

Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
248.8 8.5	- fissure at 8.5 m									
248.3 9.0	- dark grey when wet, gneiss and schist									
247.4 9.9	- fissure at 9.91 m									
245.1 12.2	- increase in fractures									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,382N, 629,496 E
Borehole Type: Hollow Stem/ NQ Diamond Coring
Date: January 24 to January 28, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
239.6 17.7	- tight fissure at 17.68 m									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

WP: 5420-02-00
Co-ordinates: 4,973,382N, 629,496 E
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Hollow Stem/ NQ Diamond Coring
Compiled By: K. Pumphrey
Datum: Geodetic
Date: January 24 to January 28, 2006
Contractor:

SUBSURFACE PROFILE			SAMPLE						Moisture Content (%)	Grain Size Distribution (%)
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	20 40 60	GR SA SI CL
232.3 25.0	- full recovery									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

Sheet: 5 of 9

WP: 5420-02-00 **Co-ordinates:** 4,973,382N, 629,496 E **Originated By:** B. Guan

Project: Gravenhurst Patrol Yard DD **Borehole Type:** Hollow Stem/ NQ Diamond Coring **Compiled By:** K. Pumphrey

Datum: Geodetic **Date:** January 24 to January 28, 2006 **Contractor:**

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
226.3 31.0	- solid granitic gneiss from 31 m									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,382N, 629,496 E
Borehole Type: Hollow Stem/ NQ Diamond Coring
Date: January 24 to January 28, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE						Moisture Content (%)	Grain Size Distribution (%)
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	20 40 60	GR SA SI CL
220.3 37.0	- yellow metallic minerals were observed at 37 m (pyrite)									
217.8 39.5	- full recovery									
216.3 41.0	-porphyritic granite vein observed at 41 m									
215.3 42.0										

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,382N, 629,496 E
Borehole Type: Hollow Stem/ NQ Diamond Coring
Date: January 24 to January 28, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
	- vertical granitic vein observed at 42 m									
210.3 / 47.0	- full recovery									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

WP: 5420-02-00 **Co-ordinates:** 4,973,382N, 629,496 E **Originated By:** B. Guan

Project: Gravenhurst Patrol Yard DD **Borehole Type:** Hollow Stem/ NQ Diamond Coring **Compiled By:** K. Pumphrey

Datum: Geodetic **Date:** January 24 to January 28, 2006 **Contractor:**

SUBSURFACE PROFILE			SAMPLE						Moisture Content (%)	Grain Size Distribution (%)
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	20 40 60	GR SA SI CL
207.5 49.8	- fracture at 49.83 m									
201.7 55.6	- fissure at 55.63 m, indication of water flowing , surface of fissure is slippery									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW13

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,382N, 629,496 E
Borehole Type: Hollow Stem/ NQ Diamond Coring
Date: January 24 to January 28, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
198.2 59.1	- fracture zone at 59.13 m that is 7.6 cm in width containing mudlike sediments									
196.3 61.0	End of Borehole									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBH14

Sheet: 1 of 1

WP: 5420-02-00
Co-ordinates: Not Available
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Geoprobe Direct Push System
Compiled By: K. Pumphrey
Datum: Geodetic
Date: February 27, 2006
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
	Ground Surface									
0.0	**TOPSOIL** Dark brown, rotted wood and plants		1	SS	14	<1 ▲				
0.6	-becoming grey brown, compact, moist		2	SS	23	<1 ▲				
1.5	**SAND** Grey brown, medium textured, compact, wet		3	SS	28	<1 ▲				
			4	SS	16	<1 ▲				
2.6	- becoming grey, loose to compact, wet		5	SS	13	<1 ▲				
3.8	End of Borehole									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EMW14

Sheet: 1 of 1

WP: 5420-02-00 **Co-ordinates:** 4,973,326 N, 629,759.1 E **Originated By:** B. Guan

Project: Gravenhurst Patrol Yard DD **Borehole Type:** Hollow Stem Augers **Compiled By:** K. Pumphrey

Datum: Geodetic **Date:** January 24, 2006 **Checked By:** D. Stewart

SUBSURFACE PROFILE			SAMPLE						Moisture Content (%)	Grain Size Distribution (%)
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	20 40 60	GR SA SI CL
251.3	Ground Surface									
0.0	**SAND** Dark brown, medium textured, some peat, wood and plants at surface, loose, moist		1	SS	2	<1 ▲		May 9/06		
250.5 0.8	- becoming grey brown, loose, moist to wet		2	SS	2	<1 ▲		Feb. 28/06		
249.7 1.5	- laminated medium to coarse textured, dense, wet		3	SS	39	<1 ▲			●	0 95.7 4.3
249.1 2.1	End of Borehole									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

Sheet: 1 of 9

WP: 5420-02-00
Co-ordinates: 4,973,256.7 N, 629,759 E
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Hollow Stem/NQ Diamond Coring
Compiled By: K. Pumphrey
Datum: Geodetic
Date: February 2 to February 3, 2006
Checked By: D. Stewart

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
251.3	Ground Surface									
0.0	**SAND** Brown, medium textured with rootlets at surface, loose		1	SS	2	N/A		May 9/06 ▼ Feb. 28/06 ▼		
250.2 1.1	- becoming compact, moist to wet		2	SS	7					1.2 89.8 9
249.4 1.8	- becoming grey brown laminated medium and coarse textured sand, dense, wet		3	SS	23					
248.2 3.0	**SAND** Grey, coarse, compact to dense, wet		4	SS	19					
			5	SS	16					
			6	SS	8					0 98.9 1.1

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

WP: 5420-02-00
Co-ordinates: 4,973,256.7 N, 629,759 E
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Hollow Stem/NQ Diamond Coring
Compiled By: K. Pumphrey
Datum: Geodetic
Date: February 2 to February 3, 2006
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,256.7 N, 629,759 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: February 2 to February 3, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
234.2 17.1	**Granitic GNEISS** Weather, fractured, dark grey when wet, grey-white when dry									
233.6 17.7	- water bearing fissures present between 17.67 and 23.47 m									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,256.7 N, 629,759 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: February 2 to February 3, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE						Moisture Content (%)	Grain Size Distribution (%)
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	20 40 60	GR SA SI CL
224.8 26.5	- granitic pegamtite vein									
223.8 27.4	- fissure containing talc									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

WP: 5420-02-00
Co-ordinates: 4,973,256.7 N, 629,759 E
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Hollow Stem/NQ Diamond Coring
Compiled By: K. Pumphrey
Datum: Geodetic
Date: February 2 to February 3, 2006
Contractor:

SUBSURFACE PROFILE			SAMPLE								
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
219.6 31.7	-fissure at 31.7 m									
216.4 34.9	- banded granitic gneiss									

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

WP: 5420-02-00
Co-ordinates: 4,973,256.7 N, 629,759 E
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Hollow Stem/NQ Diamond Coring
Compiled By: K. Pumphrey
Datum: Geodetic
Date: February 2 to February 3, 2006
Contractor:

SUBSURFACE PROFILE			SAMPLE						Moisture Content (%)	Grain Size Distribution (%)
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	20 40 60	GR SA SI CL

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

WP: 5420-02-00
Co-ordinates: 4,973,256.7 N, 629,759 E
Originated By: B. Guan
Project: Gravenhurst Patrol Yard DD
Borehole Type: Hollow Stem/NQ Diamond Coring
Compiled By: K. Pumphrey
Datum: Geodetic
Date: February 2 to February 3, 2006
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic

Co-ordinates: 4,973,256.7 N, 629,759 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: February 2 to February 3, 2006

Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL

ecoplans Limited
Environmental Site Assessment and Remediation

Log of Borehole: EBW14

WP: 5420-02-00
Project: Gravenhurst Patrol Yard DD
Datum: Geodetic
Co-ordinates: 4,973,256.7 N, 629,759 E
Borehole Type: Hollow Stem/NQ Diamond Coring
Date: February 2 to February 3, 2006
Originated By: B. Guan
Compiled By: K. Pumphrey
Contractor:

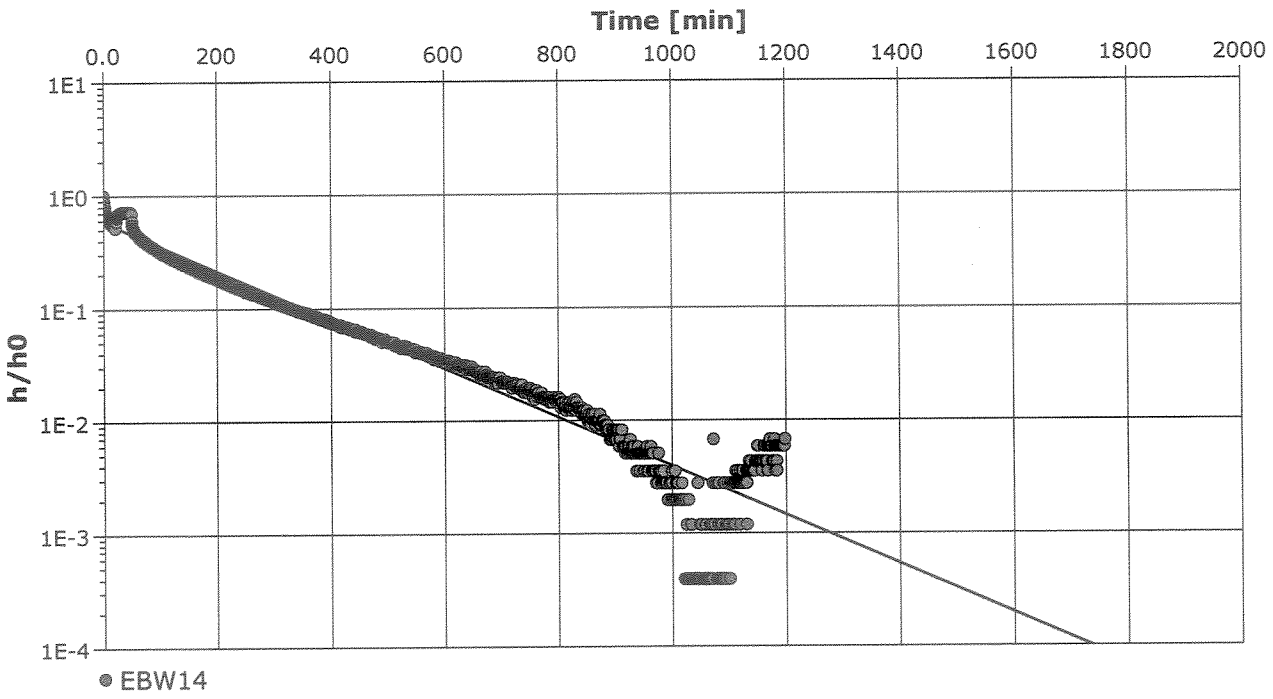
SUBSURFACE PROFILE			SAMPLE							
Elevation/ Depth (m)	Description	Strata Plot	Number	Type	"N" Value	TOV Reading (ppm) 5	Well Details	Water Levels	Moisture Content (%) 20 40 60	Grain Size Distribution (%) GR SA SI CL
190.6										
60.6	End of Borehole									

APPENDIX C

HYDRAULIC TESTING RESULTS

Ecoplans Ltd. 2655 North Sheridan Way, Suite 280 Mississauga, Ontario	Slug Test Analysis Report
	Project: Gravenhurst Patrol Yard DD
	Number: R05-0226
	Client: Ministry of Transportation

Location: Gravenhurst Ontario	Slug Test: EBW14 Recovery Test	Test Well: EBW14
Test conducted by: B. Guan		Test date: 3/14/2006
Analysis performed by: K. Pumphrey	EBW14 Hvorslev Test	Date: 3/14/2006
Aquifer Thickness: 43.59 m		

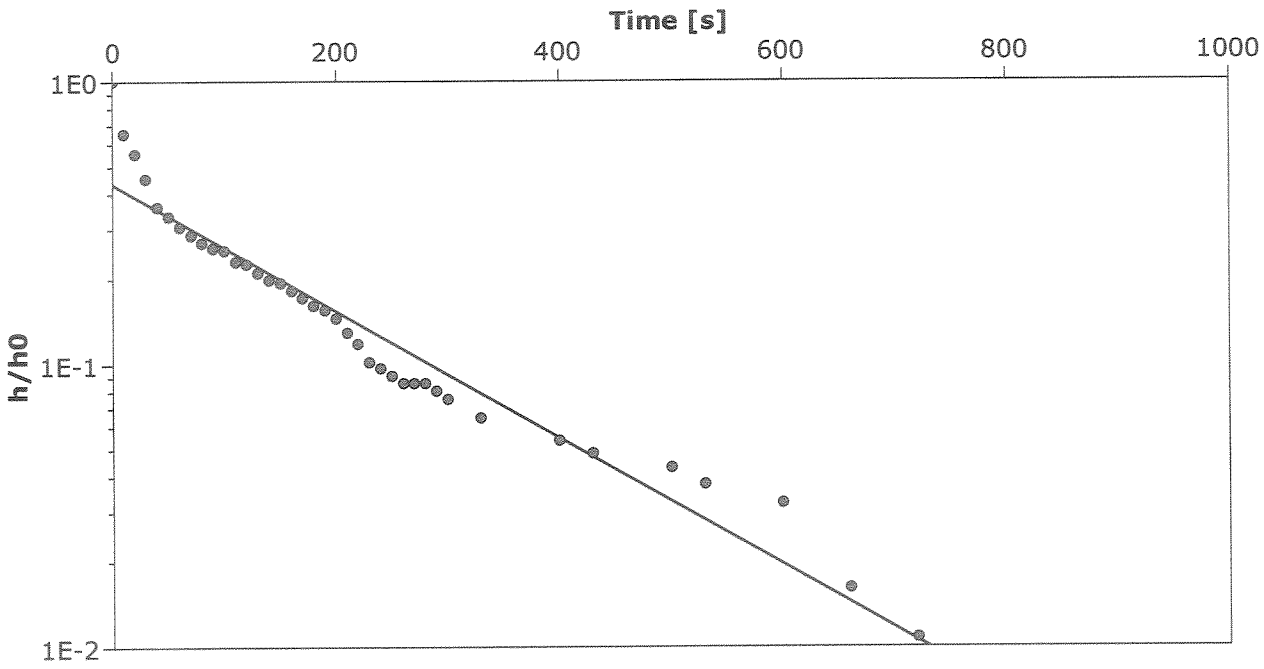


Calculation after Hvorslev

Observation well	K [m/s]	
EBW14	1.59×10^{-8}	

Ecoplans Ltd. 2655 North Sheridan Way, Suite 280 Mississauga, Ontario	Slug Test Analysis Report
	Project: Gravenhurst Patrol Yard DD
	Number: R05-0226
	Client: Ministry of Transportation

Location: Gravenhurst, Ontario	Slug Test: Single Well Response Test	Test Well: EMW14
Test conducted by: K. Pumphrey		Test date: 3/7/2006
Analysis performed by: K. Pumphrey	Single Well Response Test	Date: 3/30/2006
Aquifer Thickness: 2.10 m		



Calculation after Hvorslev

Observation well	K [m/s]	
EMW14	4.56×10^{-6}	

Ecoplans Ltd.
2655 North Sheridan Way,
Suite 280
Mississauga, Ontario

Slug Test - Water Level Data

Project: Gravenhurst Patrol Yard DD

Number: R05-0226

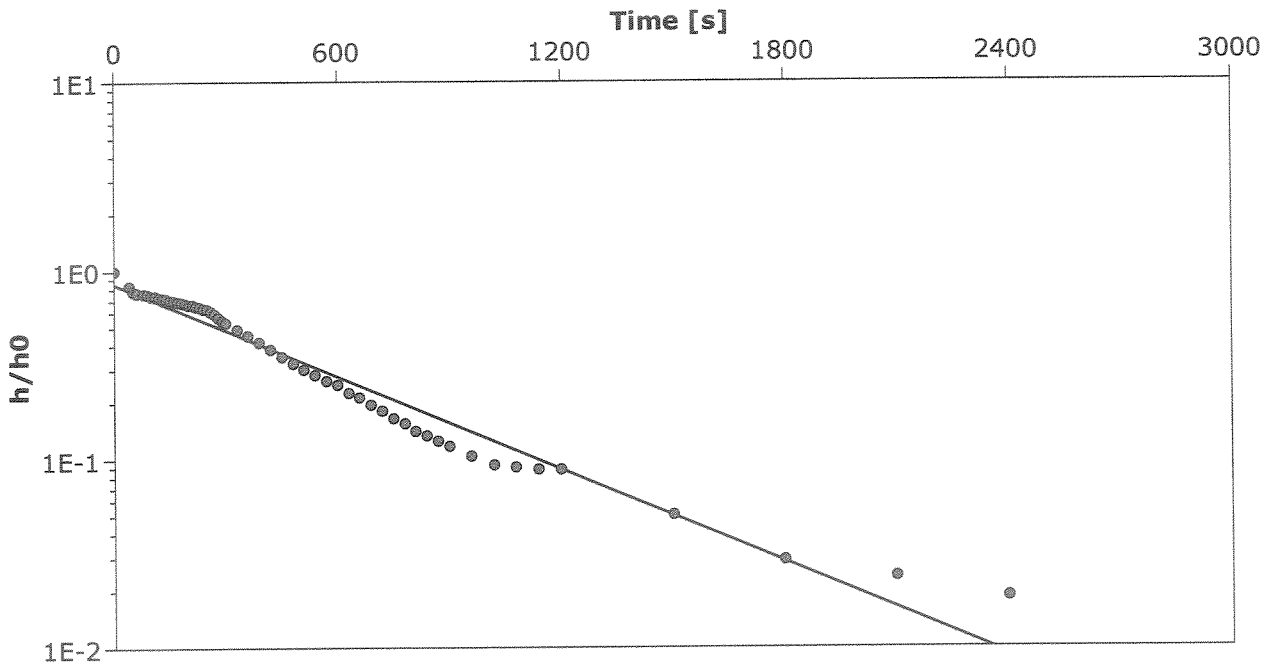
Client: Ministry of Transportation

Location: Gravenhurst, Ontario	Slug Test: Single Well Response Test	Test Well: EMW14
Test conducted by: K. Pumphrey	Test date: 3/7/2006	
Water level at t=0 [m]: 2.98	Static water level [m]: 2.05	Water level change at t=0 [m]: 0.93

	Time [s]	Water Level [m]	WL Change [m]
1	0	2.98	0.93
2	10	2.66	0.61
3	20	2.565	0.515
4	30	2.47	0.42
5	40	2.385	0.335
6	50	2.36	0.31
7	60	2.335	0.285
8	70	2.315	0.265
9	80	2.30	0.25
10	90	2.29	0.24
11	100	2.285	0.235
12	110	2.265	0.215
13	120	2.26	0.21
14	130	2.245	0.195
15	140	2.235	0.185
16	150	2.23	0.18
17	160	2.22	0.17
18	170	2.21	0.16
19	180	2.20	0.15
20	190	2.195	0.145
21	200	2.185	0.135
22	210	2.17	0.12
23	220	2.16	0.11
24	230	2.145	0.095
25	240	2.14	0.09
26	250	2.135	0.085
27	260	2.13	0.08
28	270	2.13	0.08
29	280	2.13	0.08
30	290	2.125	0.075
31	300	2.12	0.07
32	330	2.11	0.06
33	400	2.10	0.05
34	430	2.095	0.045
35	500	2.09	0.04
36	530	2.085	0.035
37	600	2.08	0.03
38	660	2.065	0.015
39	720	2.06	0.01

Ecoplans Ltd. 2655 North Sheridan Way, Suite 280 Mississauga, Ontario	Slug Test Analysis Report
	Project: Gravenhust Patrol Yard DD
	Number: R05-0226
	Client: Ministry of Transportation

Location: Gravenhurst	Slug Test: Single Well Response Test EMW12	Test Well: EMW12
Test conducted by: K. Pumphrey		Test date: 3/7/2006
Analysis performed by: K. Pumphrey	Single Well Response Test	Date: 3/30/2006
Aquifer Thickness: 2.90 m		



Calculation after Hvorslev

Observation well	K [m/s]	
EMW12	1.66×10^{-6}	

Ecoplans Ltd.
2655 North Sheridan Way,
Suite 280
Mississauga, Ontario

Slug Test - Water Level Data

Project: Gravenhust Patrol Yard DD

Number: R05-0226

Client: Ministry of Transportation

Location: Gravenhurst	Slug Test: Single Well Response Test EMW12	Test Well: EMW12
Test conducted by: K. Pumphrey	Test date: 3/7/2006	
Water level at t=0 [m]: 3.12	Static water level [m]: 1.24	Water level change at t=0 [m]: 1.89

	Time [s]	Water Level [m]	WL Change [m]
1	0	3.12	1.885
2	40	2.81	1.575
3	50	2.70	1.465
4	60	2.68	1.445
5	80	2.66	1.425
6	90	2.65	1.415
7	100	2.63	1.395
8	110	2.62	1.385
9	120	2.60	1.365
10	130	2.59	1.355
11	140	2.57	1.335
12	150	2.55	1.315
13	160	2.54	1.305
14	170	2.53	1.295
15	180	2.515	1.28
16	190	2.50	1.265
17	200	2.485	1.25
18	210	2.475	1.24
19	220	2.46	1.225
20	230	2.445	1.21
21	240	2.425	1.19
22	250	2.41	1.175
23	260	2.38	1.145
24	270	2.345	1.11
25	280	2.30	1.065
26	290	2.265	1.03
27	300	2.234	0.999
28	330	2.155	0.92
29	360	2.085	0.85
30	390	2.02	0.785
31	420	1.955	0.72
32	450	1.895	0.66
33	480	1.84	0.605
34	510	1.80	0.565
35	540	1.765	0.53
36	570	1.725	0.49
37	600	1.705	0.47
38	630	1.66	0.425
39	660	1.635	0.40
40	690	1.60	0.365
41	720	1.575	0.34
42	750	1.545	0.31
43	780	1.525	0.29
44	810	1.50	0.265
45	840	1.485	0.25
46	870	1.47	0.235

Ecoplans Ltd.
2655 North Sheridan Way,
Suite 280
Mississauga, Ontario

Slug Test - Water Level Data

Project: Gravenhust Patrol Yard DD

Number: R05-0226

Client: Ministry of Transportation

	Time [s]	Water Level [m]	WL Change [m]
47	900	1.455	0.22
48	960	1.43	0.195
49	1020	1.41	0.175
50	1080	1.405	0.17
51	1140	1.40	0.165
52	1200	1.40	0.165
53	1500	1.33	0.095
54	1800	1.29	0.055
55	2100	1.28	0.045
56	2400	1.27	0.035

APPENDIX D

LABORATORY CERTIFICATE OF ANALYSIS

5623 McADAM ROAD
MISSISSAUGA, ONTARIO
CANADA L4Z 1N9

AGAT® Laboratories

TEL: (905) 501-9998
FAX: (905) 501-0589
www.agatlabs.com

CLIENT: **ECOPLANS LTD.**
2655 North Sheridan Way
Mississauga, ON L5K2P8

ATTENTION: **DEREK STEWART**

CLIENT PROJECT # / NAME: **R05-0226**

AGAT WORK ORDER: **06T160032**

WATER ANALYSIS REVIEWED BY: **Elizabeth Polakowska, Analyst**

TRACE ORGANICS REVIEWED BY: **Irina Romanova, Irina Romanova, BSc.**

DATE REPORTED: **March 17, 2006**

PAGES (INCLUDING COVER): **11**

Should you require any information regarding this analysis please contact your client services representative at (905) 501 9998 or by email at env@agatlabs.com

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 06T160032
PROJECT NO: R05-0226

ATTENTION TO: DEREK STEWART

CLIENT NAME: ECOPLANS LTD.

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: March 07 2006 **DATE RECEIVED:** March 09 2006 **DATE REPORTED:** March 17 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW12 501416	EMW13 501419	EMW14 501421
Benzene	µg/L	5.0	0.2	<0.2	<0.2	<0.2
Toluene	µg/L	24	0.2	<0.2	<0.2	<0.2
Ethylbenzene	µg/L	2.4	0.1	<0.1	<0.1	<0.1
Xylenes (Total)	µg/L	300	0.14	<0.14	<0.14	<0.14
C6 - C10 (F1)	µg/L		100	<100	<100	<100
C6 - C10 (F1 minus BTEX)	µg/L		100	<100	<100	<100
C>10 - C16 (F2)	µg/L		100	<100	<100	<100
C6 - C16 (F1 + F2)	µg/L	1000	100	<100	<100	<100
C>16 - C34 (F3)	µg/L		500	<500	<500	<500
C>34 - C50	µg/L		500	<500	<500	<500
C>16 - C50 (F3 + F4)	µg/L	1000	500	<500	<500	<500
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA

Certified By:

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AGAT WORK ORDER: 06T160032
PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: March 07 2006 **DATE RECEIVED:** March 09 2006 **DATE REPORTED:** March 17 2006 **SAMPLE TYPE:** Water

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

501416
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

501419
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

501421
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

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AGAT WORK ORDER: 06T160032
PROJECT NO: R05-0226

ATTENTION TO: DEREK STEWART

CLIENT NAME: ECOPLANS LTD.

O. Reg 153 Petroleum Hydrocarbon F2 - F4 in Water

DATE SAMPLED: March 07 2006 **DATE RECEIVED:** March 09 2006 **DATE REPORTED:** March 17 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW2 501415
C>10 - C16 (F2)	µg/L		100	<100
C>16 - C34 (F3)	µg/L		500	<500
C>34 - C50	µg/L		500	<500
C>16 - C50 (F3 + F4)	µg/L	1000	500	<500
Gravimetric Heavy Hydrocarbons	µg/L		500	NA

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

501415 The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

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Certificate of Analysis

AGAT WORK ORDER: 06T160032
PROJECT NO: R05-0226

ATTENTION TO: DEREK STEWART

CLIENT NAME: ECOPLANS LTD.

Metals & Mercury in water

DATE SAMPLED: March 07 2006 **DATE RECEIVED:** March 09 2006 **DATE REPORTED:** March 17 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW12 501416	EMW13 501419	EMW14 501421
Aluminum	µg/L		1.00	87.3	40.6	10.4
Antimony	ug/L	6.0	1.00	<1.00	<1.00	<1.00
Arsenic	ug/L	25	0.60	<0.60	<0.60	<0.60
Barium	ug/L	1000	0.50	8.06	85.9	147
Beryllium	ug/L	4.0	1.50	<1.50	<1.50	<1.50
Bismuth	ug/L		0.50	<0.50	<0.50	<0.50
Boron	ug/L	5000	10.0	165	132	53.7
Cadmium	ug/L	5.0	0.50	<0.50	<0.50	<0.50
Chromium	ug/L	50	1.00	3.36	<1.00	2.09
Cobalt	ug/L	100	0.50	<0.50	<0.50	<0.50
Copper	ug/L	23	0.80	19.7	0.87	1.27
Iron	ug/L		2.00	93.3	133	129
Lead	ug/L	10	0.50	0.54	<0.50	2.33
Manganese	ug/L		0.60	4.70	34.2	23.4
Molybdenum	ug/L	7300	0.50	191	36.7	5.88
Nickel	ug/L	100	1.00	1.24	1.19	<1.00
Selenium	ug/L	10	0.80	<0.80	<0.80	<0.80
Silver	ug/L	1.2	0.50	<0.50	<0.50	<0.50
Sodium	mg/L	200000	0.05	44.3	26.0	13.3
Thallium	ug/L	2.0	0.30	<0.30	<0.30	<0.30
Titanium	ug/L		1.00	6.43	3.02	<1.00
Uranium	ug/L		0.20	0.74	<0.20	<0.20
Vanadium	ug/L	200	0.40	2.94	1.13	<0.40
Zinc	ug/L	1100	1.00	6.39	<1.00	23.6
Mercury	ug/L	0.12	0.10	<0.10	NS	<0.10

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)
501419 NS - No Sample received (empty bottle arrived).

Certified By: Elizabeth Rotakowska

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Certificate of Analysis

AGAT WORK ORDER: 06T160032
PROJECT NO: R05-0226

ATTENTION TO: DEREK STEWART

CLIENT NAME: ECOPLANS LTD.

Water Analysis - Inorganics incl.TOC, CN, TSS, pH & Hardness

DATE SAMPLED: March 07 2006 **DATE RECEIVED:** March 09 2006 **DATE REPORTED:** March 17 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW12 501416	EMW13 501419	EMW14 501421
Fluoride	mg/L		0.05	0.38	0.37	0.07
Chloride	mg/L		0.10	2.44	2.50	1.17
Bromide	mg/L		0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L		0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05
Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10
Sulphate	mg/L		0.10	13.7	11.0	20.0
Ammonia as N	mg/L		0.02	0.11	0.06	0.13
Total Kjeldahl Nitrogen	mg/L		0.10	0.13	<0.10	<0.10
Total Phosphorus	mg/L		0.05	<0.05	<0.05	<0.05
Total Organic Carbon *	mg/L		1	1	1	<1
Cyanide Free	mg/L		0.002	<0.002	<0.002	NS
pH	N/A		N/A	8.85	8.12	8.30
Total Hardness	mg/L CaCO3			20.9	52.0	61.2
Total Suspended Solids	mg/L		12	27	<12	<12

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard
501421 NS - No Sample received (empty bottle arrived).

Certified By: Elizabeth Polakowska

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.

PROJECT NO: R05-0226

AGAT WORK ORDER:06T160032

ATTENTION TO: DEREK STEWART

Trace Organics Analysis

RPT DATE: March 17 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water															
Benzene (µg/L)	1	501421	< 0.2	< 0.2	0.0%	< 0.2	99%	60%	140%	90%	60%	140%		60%	140%
Toluene (µg/L)	1	501421	< 0.2	< 0.2	0.0%	< 0.2	101%	60%	140%	92%	60%	140%		60%	140%
Ethylbenzene (µg/L)	1	501421	< 0.1	< 0.1	0.0%	< 0.1	100%	60%	140%	90%	60%	140%		60%	140%
Xylenes (Total) (µg/L)	1	501421	< 0.14	< 0.14	0.0%	< 0.14	95%	60%	125%	91%	60%	125%		60%	125%
C6 - C10 (F1) (µg/L)	1	501421	< 100	< 100	0.0%	< 100	72%	70%	130%	86%	80%	120%	87%	80%	120%
C>10 - C16 (F2) (µg/L)	1					< 100	105%	60%	140%	77%	60%	140%		50%	140%
C>16 - C34 (F3) (µg/L)	1					< 500	100%	60%	140%	85%	60%	140%		60%	140%
C>34 - C50 (µg/L)	1					< 500	113%	60%	130%	99%	60%	130%		60%	130%

Certified By:

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.
PROJECT NO: R05-0226

AGAT WORK ORDER:06T160032
ATTENTION TO: DEREK STEWART

Water Analysis

RPT DATE: March 17 2006

PARAMETER	Batch	Sample Id	DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
			Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Water Analysis - Inorganics incl.TOC, CN, TSS, pH & Hardness															
Total Organic Carbon * (mg/L)	79	626	2	2	0.0%	< 1	99%	90%	110%	97%	90%	110%	98%	90%	110%
Metals & Mercury in water															
Aluminum (µg/L)	1		18.8	18.8	0.0%	< 1.00	92%	90%	110%	107%	90%	110%	105%	70%	130%
Antimony (ug/L)	1		< 1.00	< 1.00	0.0%	< 1.00	110%	90%	110%	85%	80%	120%	92%	70%	130%
Arsenic (ug/L)	1		0.60	0.55	8.7%	< 0.60	106%	90%	110%	91%	90%	110%	100%	70%	130%
Barium (ug/L)	1		20.1	19.6	2.5%	< 0.50	104%	90%	110%	95%	90%	110%	95%	70%	130%
Beryllium (ug/L)	1		< 1.50	< 1.50	0.0%	< 1.50	106%	90%	110%	95%	70%	130%	106%	70%	130%
Bismuth (ug/L)	1		< 0.50	< 0.50	0.0%	< 0.50	104%	90%	110%	104%	90%	110%	94%	70%	130%
Boron (ug/L)	1		4030	4060	0.7%	< 10.0	103%	90%	110%	92%	90%	110%	90%	70%	130%
Cadmium (ug/L)	1		< 0.50	< 0.50	0.0%	< 0.50	100%	90%	110%	91%	90%	110%	101%	70%	130%
Chromium (ug/L)	1		5.19	5.21	0.4%	< 1.00	105%	90%	110%	96%	90%	110%	96%	70%	130%
Cobalt (ug/L)	1		1.07	1.05	1.9%	< 0.50	106%	90%	110%	95%	70%	130%	94%	70%	130%
Copper (ug/L)	1		1.41	1.40	0.7%	< 0.80	101%	90%	110%	95%	90%	110%	90%	70%	130%
Iron (ug/L)	1		960	912	5.1%	< 2.00	105%	90%	110%	100%	90%	110%	96%	70%	130%
Lead (ug/L)	1		< 0.50	< 0.50	0.0%	< 0.50	100%	90%	110%	96%	90%	110%	90%	70%	130%
Manganese (ug/L)	1		158	159	0.6%	< 0.60	103%	90%	110%	94%	90%	110%	86%	70%	130%
Molybdenum (ug/L)	1		< 0.50	< 0.50	0.0%	< 0.50	106%	90%	110%	98%	90%	110%	104%	70%	130%
Nickel (ug/L)	1		5.83	5.87	0.7%	< 1.00	107%	90%	110%	95%	90%	110%	92%	70%	130%
Selenium (ug/L)	1		0.89	1.02	13.6%	< 0.80	106%	90%	110%	92%	90%	110%	104%	70%	130%
Silver (ug/L)	1		< 0.50	< 0.50	0.0%	< 0.50	101%	90%	110%	84%	80%	120%	82%	70%	130%
Sodium (mg/L)	1		26.4	26.0	1.5%	< 0.05	100%	90%	110%	102%	90%	110%	90%	70%	130%
Thallium (ug/L)	1		< 0.30	< 0.30	0.0%	< 0.30	101%	90%	110%	88%	80%	120%	86%	70%	130%
Titanium (ug/L)	1		3.71	3.77	1.6%	< 1.00	103%	90%	110%	100%	90%	110%	101%	70%	130%
Uranium (ug/L)	1		< 0.20	< 0.20	0.0%	< 0.20	101%	90%	110%	103%	90%	110%	97%	70%	130%
Vanadium (ug/L)	1		0.75	0.79	5.2%	< 0.40	105%	90%	110%	95%	90%	110%	96%	70%	130%
Zinc (ug/L)	1		2.61	2.61	0.0%	< 1.00	109%	90%	110%	99%	90%	110%	102%	60%	140%
Mercury (ug/L)	1	501416	< 0.10	< 0.10	0.0%	< 0.10	97%	90%	110%	100%	90%	110%	104%	70%	130%
Water Analysis - Inorganics incl.TOC, CN, TSS, pH & Hardness															
Fluoride (mg/L)	1	501421	0.07	0.07	0.0%	< 0.05	99%	90%	110%	94%	90%	110%	88%	80%	120%
Chloride (mg/L)	1	501421	1.17	1.18	0.9%	< 0.10	95%	90%	110%	92%	90%	110%	100%	80%	120%
Bromide (mg/L)	1	501421	< 0.05	< 0.05	0.0%	< 0.05	99%	90%	110%	97%	90%	110%	100%	80%	120%
Nitrate as N (mg/L)	1	501421	< 0.05	< 0.05	0.0%	< 0.05	95%	90%	110%	96%	90%	110%	99%	80%	120%
Nitrite as N (mg/L)	1	501421	< 0.05	< 0.05	0.0%	< 0.05	NA	90%	110%	95%	90%	110%	97%	80%	120%
Phosphate as P (mg/L)	1	501421	< 0.10	< 0.10	0.0%	< 0.10	96%	90%	110%	101%	90%	110%	102%	80%	120%

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.

PROJECT NO: R05-0226

AGAT WORK ORDER:06T160032

ATTENTION TO: DEREK STEWART

Water Analysis (Continued)

RPT DATE: March 17 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Sulphate (mg/L)	1	501421	20.0	20.1	0.5%	< 0.10	94%	90%	110%	95%	90%	110%	100%	80%	120%
Ammonia as N (mg/L)	1	501416	0.11	0.10	9.5%	< 0.02	106%	80%	120%	114%	80%	120%	98%	80%	120%
Total Kjeldahl Nitrogen (mg/L)	1		3.91	2.95	28.0%	< 0.10	103%	90%	110%	104%	90%	110%	83%	80%	120%
Total Phosphorus (mg/L)	1		0.90	1.02	12.5%	< 0.05	99%	90%	110%	94%	90%	110%	96%	80%	120%
Total Organic Carbon * (mg/L)	1					< 1		90%	110%		90%	110%		90%	110%
Cyanide Free (mg/L)	1	501419	< 0.002	< 0.002	0.0%	< 0.002	93%	90%	110%	102%	90%	110%	108%	80%	120%
pH (N/A)	1		8.03	8.04	0.1%	N/A	100%	80%	120%						
Total Suspended Solids (mg/L)	1	501421	< 12	< 12	0.0%	< 12	92%	80%	120%						

Certified By: Elizabeth Potakowska

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Method Summary

CLIENT NAME: ECOPLANS LTD.

AGAT WORK ORDER:06T160032

PROJECT NO: R05-0226

ATTENTION TO: DEREK STEWART

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Parameters			
Benzene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Toluene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Ethylbenzene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Xylenes (Total)	VOL 5007	EPA SW-846 5030B & 8015	GC/FID (P & T)
C6 - C10 (F1)	VOL - 5010	MOE E3421	P & T GC/MS
C6 - C10 (F1 minus BTEX)	VOL - 5010	MOE E3421	P & T GC/MS
C>10 - C16 (F2)	VOL - 5010	MOE E3421	GC / FID
C6 - C16 (F1 + F2)	VOL - 5010	MOE E3421	P & T GC/MS / GC/FID
C>16 - C34 (F3)	VOL - 5010	MOE E3421	GC / FID
C>34 - C50	VOL - 5010	MOE E3421	GC / FID
C>16 - C50 (F3 + F4)	VOL - 5010	MOE E3421	GC / FID
Gravimetric Heavy Hydrocarbons	VOL - 5010	MOE E3421	GRAVIMETRIC ANALYSIS
C>10 - C16 (F2)	VOL - 5010	MOE E3421	GC / FID
C>16 - C34 (F3)	VOL - 5010	MOE E3421	GC / FID
C>34 - C50	VOL - 5010	MOE E3421	GC / FID
C>16 - C50 (F3 + F4)	VOL - 5010	MOE E3421	GC / FID
Gravimetric Heavy Hydrocarbons	VOL - 5010	MOE E3421	GRAVIMETRIC ANALYSIS

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Method Summary

CLIENT NAME: ECOPLANS LTD.

PROJECT NO: R05-0226

AGAT WORK ORDER:06T160032

ATTENTION TO: DEREK STEWART

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Parameters			
Aluminum	MET 1003	EPA 200.8 & SM 3125 B	ICP/MS
Antimony	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Arsenic	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Barium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Beryllium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Bismuth	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Boron	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Cadmium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Chromium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Cobalt	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Copper	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Iron	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Lead	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Manganese	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Molybdenum	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Nickel	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Selenium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Silver	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Sodium	MET 1002	EPA 6010 B & 3120 B	ICP-OES
Thallium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Titanium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Uranium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Vanadium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Zinc	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Mercury	MET 1000	EPA 245.5 & SM 3112 B	CVAA
Fluoride	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Phosphate as P	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR 1002	SM 4500 NH3-F	AQ-2 AUTOANALYSER
Total Kjeldahl Nitrogen	INOR 1048	QUICKCHEM, Method 10-107-06-2-I & SM 4500-N B	LACHAT
Total Phosphorus	INOR 1022	SM 4500 P E	SPECTROPHOTOMETER
Total Organic Carbon *	INS 0500	SM 5310 B	COMBUSTION INFRARED
Cyanide Free	INOR 1035	SM 4500 CN E	SPECTROPHOTOMETER
pH	INOR 1020	SM 4500 H+ B	pH METER
Total Hardness		SM 2340 B	CALCULATION
Total Suspended Solids	INOR 1028	SM 2540 D	GRAVIMETRIC ANALYSIS

AGAT® Laboratories

CLIENT NAME: ECOPLANS LTD.

Certificate of Analysis

AGAT WORK ORDER: 06T159117

PROJECT NO: R05-0226

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ATTENTION TO: DEREK STEWART

Metals in water

DATE SAMPLED: February 28 2006 **DATE RECEIVED:** March 03 2006 **DATE REPORTED:** March 14 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW1 500079	EMW2 500082	EMW3 500092	EMW4 500093	EMW5 500095	EMW6 500098	EMW7 500113	EMW8 500115
Aluminum	µg/L		1.00	171	76.0	15.3	18.0	18.0	40.0	25.0	122
Antimony	ug/L	6.0	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	ug/L	25	0.60	<0.60	<0.60	0.92	<0.60	<0.60	<0.60	<0.60	<0.60
Barium	ug/L	1000	0.50	13.0	19.2	30.8	9.02	21.0	11.7	6.51	11.1
Beryllium	ug/L	4.0	1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	ug/L		0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	ug/L	5000	10.0	25.0	19.7	18.3	12.1	11.0	<10.0	<10.0	<10.0
Cadmium	ug/L	5.0	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	ug/L	50	1.00	1.50	4.03	2.34	2.69	3.04	<1.00	2.97	3.65
Cobalt	ug/L	100	0.50	8.33	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.74
Copper	ug/L	23	0.80	4.47	6.94	4.44	3.34	2.59	2.60	2.14	5.31
Iron	ug/L		2.00	16300	44.6	98.1	20.0	16.4	23.7	16.2	52.8
Lead	ug/L	10	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese	ug/L		0.60	442	5.96	90.2	5.78	10.1	7.99	11.8	13.0
Molybdenum	ug/L	7300	0.50	<0.50	<0.50	20.2	<0.50	<0.50	<0.50	<0.50	<0.50
Nickel	ug/L	100	1.00	1.06	<1.00	7.28	<1.00	<1.00	<1.00	<1.00	<1.00
Selenium	ug/L	10	0.80	<0.80	<0.80	0.83	<0.80	<0.80	<0.80	<0.80	<0.80
Silver	ug/L	1.2	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium	ug/L	200000	100	7910	3080	58600	3720	2560	2420	1520	3790
Thallium	ug/L	2.0	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	ug/L		1.00	3.50	1.03	3.34	<1.00	<1.00	<1.00	<1.00	1.59
Uranium	ug/L		0.20	<0.20	<0.20	1.01	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	ug/L	200	0.40	1.46	<0.40	2.80	<0.40	<0.40	<0.40	<0.40	<0.40
Zinc	ug/L	1100	1.00	10.6	11.6	4.64	7.82	6.23	6.82	9.37	13.4
Mercury	ug/L	0.12	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Certified By: Jordy Takemeli

AGAT® Laboratories

CLIENT NAME: ECOPLANS LTD.

Certificate of Analysis

AGAT WORK ORDER: 06T159117

PROJECT NO: R05-0226

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ATTENTION TO: DEREK STEWART

Metals in water

DATE SAMPLED: February 28 2006 **DATE RECEIVED:** March 03 2006 **DATE REPORTED:** March 14 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW9 500116	EMW10 500117	EMW11 500118	EMW15 500119	EMW17 500120	EMW12 500121	EMW16 500122	EMW14 500123
Aluminum	µg/L		1.00	80.4	21.5	404	15.2	1.19	16.7	19.8	26.0
Antimony	ug/L	6.0	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	ug/L	25	0.60	<0.60	<0.60	<0.60	1.01	<0.60	<0.60	<0.60	<0.60
Barium	ug/L	1000	0.50	3.27	7.85	6.33	31.0	<0.50	24.2	24.8	15.9
Beryllium	ug/L	4.0	1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	ug/L		0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	ug/L	5000	10.0	<10.0	<10.0	10.5	14.4	<10.0	<10.0	<10.0	<10.0
Cadmium	ug/L	5.0	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	ug/L	50	1.00	3.16	2.85	3.09	2.90	2.72	2.98	3.09	2.93
Cobalt	ug/L	100	0.50	<0.50	<0.50	1.60	<0.50	<0.50	1.44	1.43	<0.50
Copper	ug/L	23	0.80	2.80	5.34	4.42	3.54	<0.80	3.01	3.45	3.15
Iron	ug/L		2.00	30.8	20.2	141	90.8	<2.00	25.4	29.9	28.9
Lead	ug/L	10	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese	ug/L		0.60	7.34	14.2	87.9	91.3	<0.60	104	105	48.2
Molybdenum	ug/L	7300	0.50	0.85	<0.50	1.27	19.9	<0.50	63.1	66.1	<0.50
Nickel	ug/L	100	1.00	<1.00	<1.00	1.89	6.83	<1.00	7.92	8.13	<1.00
Selenium	ug/L	10	0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Silver	ug/L	1.2	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium	ug/L	200000	100	14600	2140	6760	58300	304	3680	3760	984
Thallium	ug/L	2.0	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	ug/L		1.00	1.07	<1.00	8.42	3.32	<1.00	<1.00	<1.00	<1.00
Uranium	ug/L		0.20	<0.20	<0.20	<0.20	1.00	<0.20	<0.20	<0.20	<0.20
Vanadium	ug/L	200	0.40	<0.40	<0.40	<0.40	2.75	<0.40	<0.40	<0.40	<0.40
Zinc	ug/L	1100	1.00	7.70	13.4	4.40	4.35	<1.00	6.28	7.68	11.8
Mercury	ug/L	0.12	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

Certified By: Jordy Takeuchi

AGAT® Laboratories

CLIENT NAME: ECOPLANS LTD.

Certificate of Analysis

AGAT WORK ORDER: 06T159117

PROJECT NO: R05-0226

5623 McADAM ROAD
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ATTENTION TO: DEREK STEWART

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Water Analysis - Inorganics

DATE SAMPLED: February 28 2006 **DATE RECEIVED:** March 03 2006 **DATE REPORTED:** March 14 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW1 500079	EMW2 500082	EMW3 500092	EMW4 500093	EMW5 500095	EMW6 500098	EMW7 500113	EMW8 500115
Electrical Conductivity	uS/cm		2	41	40	435	24	31	29	24	29
Fluoride	mg/L		0.05	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	0.05
Chloride	mg/L	250	0.10	1.66	1.14	4.69	0.97	1.31	1.51	1.08	1.14
Bromide	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	10	0.05	<0.05	<0.05	0.55	<0.05	<0.05	<0.05	<0.05	0.13
Nitrite as N	mg/L	1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	mg/L		0.10	7.23	13.6	129	5.55	6.14	5.81	5.61	8.37
Ammonia as N	mg/L		0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.10	2.34	1.28	0.19	0.70	0.37	0.46	0.65	1.77

	Unit	G / S	M.D.L.	EMW9 500116	EMW10 500117	EMW11 500118	EMW15 500119	EMW17 500120
Electrical Conductivity	uS/cm		2	55	27	72	429	2
Fluoride	mg/L		0.05	<0.05	<0.05	<0.05	0.08	<0.05
Chloride	mg/L	250	0.10	1.23	1.20	1.60	4.73	<0.10
Bromide	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	10	0.05	<0.05	<0.05	<0.05	0.54	<0.05
Nitrite as N	mg/L	1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	mg/L		0.10	9.64	5.79	17.7	131	<0.10
Ammonia as N	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.10	1.25	0.24	0.72	0.25	<0.10

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

Certified By: Jordy Takewell

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Certificate of Analysis

AGAT WORK ORDER: 06T159117
PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

Water Analysis - Inorganics incl.TOC, CN, TSS, pH & Hardness

DATE SAMPLED: February 28 2006 **DATE RECEIVED:** March 03 2006 **DATE REPORTED:** March 14 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW12 500121	EMW16 500122	M.D.L	EMW14 500123
Electrical Conductivity	uS/cm		2	59	60	2	26
Fluoride	mg/L		0.05	<0.05	<0.05	0.05	<0.05
Chloride	mg/L	250	0.10	3.05	3.08	0.10	0.92
Bromide	mg/L		0.05	<0.05	<0.05	0.05	<0.05
Nitrate as N	mg/L	10	0.05	<0.05	<0.05	0.05	<0.05
Nitrite as N	mg/L	1	0.05	<0.05	<0.05	0.05	<0.05
Sulphate	mg/L		0.10	9.18	9.24	0.10	4.93
Ammonia as N	mg/L		0.02	<0.02	<0.02	0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.10	2.64	2.49	0.10	<0.10
Total Phosphorus	mg/L		0.05	45.4	54.4	0.05	0.23
Total Organic Carbon *	mg/L		5	100	113	1	2
Cyanide Free	mg/L		0.002	<0.002	<0.002	0.002	<0.002
pH	N/A		N/A	6.51	6.53	N/A	6.01
Total Hardness	mg/L CaCO3			19.9	20.0		8.74
Total Suspended Solids	mg/L		12	6160	12200	12	55

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

Certified By: Jacky Takeuchi

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.

PROJECT NO: R05-0226

AGAT WORK ORDER:06T159117

ATTENTION TO: DEREK STEWART

Trace Organics Analysis

RPT DATE: March 14 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water															
Benzene (µg/L)	1	500117	< 0.2	< 0.2	0.0%	< 0.2	103%	60%	140%	90%	60%	140%		60%	140%
Toluene (µg/L)	1	500117	< 0.2	< 0.2	0.0%	< 0.2	102%	60%	140%	91%	60%	140%		60%	140%
Ethylbenzene (µg/L)	1	500117	< 0.1	< 0.1	0.0%	< 0.1	99%	60%	140%	88%	60%	140%		60%	140%
Xylenes (Total) (µg/L)	1	500117	< 0.14	< 0.14	0.0%	< 0.14	93%	60%	125%	88%	60%	125%		60%	125%
C6 - C10 (F1) (µg/L)	1	500117	< 100	< 100	0.0%	< 100	76%	70%	130%	95%	90%	110%			
C>10 - C16 (F2) (µg/L)	1					< 100	84%	60%	140%	76%	60%	140%		50%	140%
C>16 - C34 (F3) (µg/L)	1					< 500	88%	60%	130%	92%	60%	130%		60%	130%
C>34 - C50 (µg/L)	1					< 500	86%	60%	130%	105%	60%	130%		60%	130%

Certified By:

AGAT QUALITY ASSURANCE REPORT

5623 McADAM ROAD
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Quality Assurance

CLIENT NAME: ECOPLANS LTD.
PROJECT NO: R05-0226

AGAT WORK ORDER:06T159117
ATTENTION TO: DEREK STEWART

Water Analysis

RPT DATE: March 14 2006

PARAMETER	Batch	Sample Id	DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
			Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals in water															
Aluminum (µg/L)	1	500095	18.0	17.9	0.6%	< 1.00	109%	90%	110%	89%	80%	120%	81%	70%	130%
Antimony (ug/L)	1	500095	< 1.00	< 1.00	0.0%	< 1.00	107%	90%	110%	84%	80%	120%	86%	70%	130%
Arsenic (ug/L)	1	500095	< 0.60	< 0.60	0.0%	< 0.60	99%	90%	110%	94%	90%	110%	103%	70%	130%
Barium (ug/L)	1	500095	21.0	21.2	0.9%	< 0.50	103%	90%	110%	97%	90%	110%	98%	70%	130%
Beryllium (ug/L)	1	500095	< 1.50	< 1.50	0.0%	< 1.50	97%	90%	110%	100%	90%	110%	101%	70%	130%
Bismuth (ug/L)	1	500095	< 0.50	< 0.50	0.0%	< 0.50	103%	90%	110%	101%	90%	110%	86%	70%	130%
Boron (ug/L)	1	500095	11.0	10.3	6.6%	< 10.0	107%	90%	110%	111%	80%	120%	90%	70%	130%
Cadmium (ug/L)	1	500095	< 0.50	< 0.50	0.0%	< 0.50	98%	90%	110%	99%	90%	110%	90%	70%	130%
Chromium (ug/L)	1	500095	3.04	3.02	0.7%	< 1.00	99%	90%	110%	98%	90%	110%	89%	70%	130%
Cobalt (ug/L)	1	500095	< 0.50	< 0.50	0.0%	< 0.50	99%	90%	110%	98%	90%	110%	92%	70%	130%
Copper (ug/L)	1	500095	2.59	2.48	4.3%	< 0.80	98%	90%	110%	99%	90%	110%	83%	70%	130%
Iron (ug/L)	1	500095	16.4	15.2	7.6%	< 2.00	99%	90%	110%	102%	90%	110%		70%	130%
Lead (ug/L)	1	500095	< 0.50	< 0.50	0.0%	< 0.50	105%	90%	110%	97%	90%	110%	87%	70%	130%
Manganese (ug/L)	1	500095	10.1	9.95	1.5%	< 0.60	92%	90%	110%	90%	90%	110%	66%	60%	140%
Molybdenum (ug/L)	1	500095	< 0.50	< 0.50	0.0%	< 0.50	104%	90%	110%	99%	90%	110%	103%	70%	130%
Nickel (ug/L)	1	500095	< 1.00	< 1.00	0.0%	< 1.00	100%	90%	110%	99%	90%	110%	87%	70%	130%
Selenium (ug/L)	1	500095	< 0.80	< 0.80	0.0%	< 0.80	100%	90%	110%	98%	90%	110%	107%	70%	130%
Silver (ug/L)	1	500095	< 0.50	< 0.50	0.0%	< 0.50	100%	90%	110%	90%	90%	110%	77%	70%	130%
Sodium (ug/L)	1	500115	3790	3750	1.1%	< 100	98%	90%	110%	102%	90%	110%	83%	70%	130%
Thallium (ug/L)	1	500095	< 0.30	< 0.30	0.0%	< 0.30	99%	90%	110%	99%	90%	110%	91%	70%	130%
Titanium (ug/L)	1	500095	< 1.00	< 1.00	0.0%	< 1.00	101%	90%	110%	100%	90%	110%	96%	70%	130%
Uranium (ug/L)	1	500095	< 0.20	< 0.20	0.0%	< 0.20	104%	90%	110%	100%	90%	110%	98%	70%	130%
Vanadium (ug/L)	1	500095	< 0.40	< 0.40	0.0%	< 0.40	99%	90%	110%	97%	90%	110%	96%	70%	130%
Zinc (ug/L)	1	500095	6.23	5.96	4.4%	< 1.00	102%	90%	110%	98%	90%	110%	71%	70%	130%
Mercury (ug/L)	75				0.0%	< 0.10	98%	90%	110%	95%	90%	110%	95%	70%	130%
Water Analysis - Inorganics															
Electrical Conductivity (uS/cm)	1	500117	27	28	3.6%	< 2	94%	80%	120%						
Fluoride (mg/L)	1	500079	< 0.05	< 0.05	0.0%	< 0.05	97%	90%	110%	101%	90%	110%	95%	80%	120%
Chloride (mg/L)	1	500079	1.66	1.63	1.8%	< 0.10	95%	90%	110%	93%	90%	110%	93%	80%	120%
Bromide (mg/L)	1	500079	< 0.05	< 0.05	0.0%	< 0.05	98%	90%	110%	97%	90%	110%	98%	80%	120%
Nitrate as N (mg/L)	1	500079	< 0.05	< 0.05	0.0%	< 0.05	94%	90%	110%	98%	90%	110%	95%	80%	120%
Nitrite as N (mg/L)	1	500079	< 0.05	< 0.05	0.0%	< 0.05	NA	90%	110%	96%	90%	110%	94%	80%	120%
Phosphate as P (mg/L)	1	500079	< 0.10	< 0.10	0.0%	< 0.10	99%	90%	110%	105%	90%	110%	107%	80%	120%
Sulphate (mg/L)	1	500079	7.23	7.19	0.6%	< 0.10	95%	90%	110%	96%	90%	110%	95%	80%	120%
Ammonia as N (mg/L)	1	500092	< 0.02	< 0.02	0.0%	< 0.02	98%	80%	120%	96%	90%	110%	81%	80%	120%

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.
PROJECT NO: R05-0226

AGAT WORK ORDER:06T159117
ATTENTION TO: DEREK STEWART

Water Analysis (Continued)

RPT DATE: March 14 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Kjeldahl Nitrogen (mg/L)	1	500082	1.28	1.28	0.0%	< 0.10	95%	90%	110%	98%	90%	110%	103%	80%	120%
Water Analysis - Inorganics incl.TOC, CN, TSS, pH & Hardness															
Total Phosphorus (mg/L)	1		< 0.05	< 0.05	0.0%	< 0.05	100%	90%	110%	96%	90%	110%	84%	80%	120%
Total Organic Carbon * (mg/L)	75	899	2	2	0.0%	< 1	93%	90%	110%	95%	90%	110%	95%	90%	110%
Cyanide Free (mg/L)	1	500122	< 0.002	< 0.002	0.0%	< 0.002	109%	90%	110%	105%	90%	110%	101%	80%	120%
pH (N/A)	1		1.36	1.35	0.7%	N/A	100%	80%	120%						
Total Suspended Solids (mg/L)	1	500123	55	62	12.0%	< 12	92%	80%	120%						
Water Analysis - Inorganics															
Fluoride (mg/L)	1	500120	< 0.05	< 0.05	0.0%	< 0.05		90%	110%		90%	110%		80%	120%
Chloride (mg/L)	1	500120	< 0.10	< 0.10	0.0%	< 0.10		90%	110%		90%	110%		80%	120%
Bromide (mg/L)	1	500120	< 0.05	< 0.05	0.0%	< 0.05		90%	110%		90%	110%		80%	120%
Nitrate as N (mg/L)	1	500120	< 0.05	< 0.05	0.0%	< 0.05		90%	110%		90%	110%		80%	120%
Nitrite as N (mg/L)	1	500120	< 0.05	< 0.05	0.0%	< 0.05		90%	110%		90%	110%		80%	120%
Phosphate as P (mg/L)	1	500120	< 0.10	< 0.10	0.0%	< 0.10		90%	110%		90%	110%		80%	120%
Sulphate (mg/L)	1	500120	< 0.10	< 0.10	0.0%	< 0.10		90%	110%		90%	110%		80%	120%
Metals in water															
Aluminum (µg/L)	1	500122	19.8	19.8	0.0%	< 1.00		90%	110%		90%	110%		70%	130%
Antimony (ug/L)	1	500122	< 1.00	< 1.00	0.0%	< 1.00		90%	110%		90%	110%		70%	130%
Arsenic (ug/L)	1	500122	< 0.60	< 0.60	0.0%	< 0.60		90%	110%		90%	110%		70%	130%
Barium (ug/L)	1	500122	24.8	23.9	3.7%	< 0.50		90%	110%		90%	110%		70%	130%
Beryllium (ug/L)	1	500122	< 1.50	< 1.50	0.0%	< 1.50		90%	110%		90%	110%		70%	130%
Bismuth (ug/L)	1	500122	< 0.50	< 0.50	0.0%	< 0.50		90%	110%		90%	110%		70%	130%
Boron (ug/L)	1	500122	< 10.0	< 10.0	0.0%	< 10.0		90%	110%		90%	110%		60%	140%
Cadmium (ug/L)	1	500122	< 0.50	< 0.50	0.0%	< 0.50		90%	110%		90%	110%		70%	130%
Chromium (ug/L)	1	500122	3.09	3.07	0.6%	< 1.00		90%	110%		90%	110%		70%	130%
Cobalt (ug/L)	1	500122	1.43	1.42	0.7%	< 0.50		90%	110%		90%	110%		70%	130%
Copper (ug/L)	1	500122	3.45	3.29	4.7%	< 0.80		90%	110%		90%	110%		70%	130%
Iron (ug/L)	1	500122	29.9	30.6	2.3%	< 2.00		90%	110%		90%	110%		70%	130%
Lead (ug/L)	1	500122	< 0.50	< 0.50	0.0%	< 0.50		90%	110%		90%	110%		70%	130%
Manganese (ug/L)	1	500122	105	105	0.0%	< 0.60		90%	110%		90%	110%		70%	130%
Molybdenum (ug/L)	1	500122	66.1	64.6	2.3%	< 0.50		90%	110%		90%	110%		70%	130%
Nickel (ug/L)	1	500122	8.13	8.12	0.1%	< 1.00		90%	110%		90%	110%		70%	130%
Selenium (ug/L)	1	500122	< 0.80	< 0.80	0.0%	< 0.80		90%	110%		90%	110%		60%	140%
Silver (ug/L)	1	500122	< 0.50	< 0.50	0.0%	< 0.50		90%	110%		90%	110%		70%	130%
Thallium (ug/L)	1	500122	< 0.30	< 0.30	0.0%	< 0.30		90%	110%		90%	110%		70%	130%

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.
PROJECT NO: R05-0226

AGAT WORK ORDER:06T159117
ATTENTION TO: DEREK STEWART

Water Analysis (Continued)

RPT DATE: March 14 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Titanium (ug/L)	1	500122	< 1.00	< 1.00	0.0%	< 1.00		90%	110%		90%	110%		70%	130%
Uranium (ug/L)	1	500122	< 0.20	< 0.20	0.0%	< 0.20		80%	120%		90%	110%		70%	130%
Vanadium (ug/L)	1	500122	< 0.40	< 0.40	0.0%	< 0.40		90%	110%		90%	110%		70%	130%
Zinc (ug/L)	1	500122	7.68	7.96	3.6%	< 1.00		90%	110%		90%	110%		70%	130%

Certified By: Jacky Takeuchi

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Method Summary

CLIENT NAME: ECOPLANS LTD.

PROJECT NO: R05-0226

AGAT WORK ORDER:06T159117

ATTENTION TO: DEREK STEWART

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Parameters			
Benzene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Toluene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Ethylbenzene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Xylenes (Total)	VOL 5007	EPA SW-846 5030B & 8015	GC/FID (P & T)
C6 - C10 (F1)	VOL - 5010	MOE E3421	P & T GC/MS
C6 - C10 (F1 minus BTEX)	VOL - 5010	MOE E3421	P & T GC/MS
C>10 - C16 (F2)	VOL - 5010	MOE E3421	GC / FID
C6 - C16 (F1 + F2)	VOL - 5010	MOE E3421	P & T GC/MS / GC/FID
C>16 - C34 (F3)	VOL - 5010	MOE E3421	GC / FID
C>34 - C50	VOL - 5010	MOE E3421	GC / FID
C>16 - C50 (F3 + F4)	VOL - 5010	MOE E3421	GC / FID
Gravimetric Heavy Hydrocarbons	VOL - 5010	MOE E3421	GRAVIMETRIC ANALYSIS
Benzene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Toluene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Ethylbenzene	VOL 5001	EPA SW-846 5230B & 8260	P & T GC/MS
Xylenes (Total)	VOL 5007	EPA SW-846 5030B & 8015	GC/FID (P & T)
C6 - C10 (F1)	VOL - 5010	MOE E3421	P & T GC/MS
C6 - C10 (F1 minus BTEX)	VOL - 5010	MOE E3421	P & T GC/MS

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Method Summary

CLIENT NAME: ECOPLANS LTD.

PROJECT NO: R05-0226

AGAT WORK ORDER:06T159117

ATTENTION TO: DEREK STEWART

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Parameters			
Aluminum	MET 1003	EPA 200.8 & SM 3125 B	ICP/MS
Antimony	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Arsenic	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Barium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Beryllium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Bismuth	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Boron	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Cadmium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Chromium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Cobalt	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Copper	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Iron	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Lead	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Manganese	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Molybdenum	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Nickel	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Selenium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Silver	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Sodium	MET 1002	EPA 6010 B & 3120 B	ICP-OES
Thallium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Titanium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Uranium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Vanadium	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Zinc	MET 1002	EPA 200.8 & SM 3125 B	ICP/MS
Mercury	MET 1000	EPA 245.5 & SM 3112 B	CVAA
Electrical Conductivity	INOR 1016	SM 2510 B	EC Meter
Fluoride	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Phosphate as P	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR 1002	SM 4500 NH3-F	AQ-2 AUTOANALYSER
Total Kjeldahl Nitrogen	INOR 1048	QUICKCHEM, Method 10-107-06-2-I & SM 4500-N B	LACHAT
Electrical Conductivity	INOR 1016	SM 2510 B	EC Meter
Fluoride	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR 1002	SM 4500 NH3-F	AQ-2 AUTOANALYSER
Total Kjeldahl Nitrogen	INOR 1048	QUICKCHEM, Method 10-107-06-2-I & SM 4500-N B	LACHAT
Total Phosphorus	INOR 1022	SM 4500 P E	SPECTROPHOTOMETER
Total Organic Carbon *	INS 0500	SM 5310 B	COMBUSTION INFRARED
Cyanide Free	INOR 1035	SM 4500 CN E	SPECTROPHOTOMETER

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Method Summary

CLIENT NAME: ECOPLANS LTD.

AGAT WORK ORDER:06T159117

PROJECT NO: R05-0226

ATTENTION TO: DEREK STEWART

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
pH	INOR 1020	SM 4500 H+ B	pH METER
Total Hardness		SM 2340 B	CALCULATION
Total Suspended Solids	INOR 1028	SM 2540 D	GRAVIMETRIC ANALYSIS

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CLIENT: **ECOPLANS LTD.**
2655 North Sheridan Way
Mississauga, ON L5K2P8

ATTENTION: **Joyce Lastiwka**

CLIENT PROJECT # / NAME: **R05-0226**

AGAT WORK ORDER: **06T154730**

SOIL ANALYSIS REVIEWED BY: **Jacky Takeuchi, BSc.H(Chem. Eng), BSc (Biology), C. Chem**

TRACE ORGANICS REVIEWED BY: **Irina Romanova, Irina Romanova, BSc.**

DATE REPORTED: **February 08, 2006**

PAGES (INCLUDING COVER): **7**

Should you require any information regarding this analysis please contact your client services representative at (905) 501 9998 or by email at env@agatlabs.com

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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AGAT WORK ORDER: 06T154730

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: Joyce Lastiwka

O. Reg. 153 Metals & pH, EC, SAR (Soil) - Table 1

DATE SAMPLED: January 24 2006 **DATE RECEIVED:** February 01 2006 **DATE REPORTED:** February 08 2006 **SAMPLE TYPE:** Soil

	Unit	G / S	M.D.L.	BH1-1 494616	BH1-2 494617
Antimony	µg/g	1.0	0.8	<0.8	<0.8
Arsenic	µg/g	17	0.3	<0.3	0.6
Barium	µg/g	210	0.2	8.2	86.3
Beryllium	µg/g	1.2	0.2	<0.2	0.2
Cadmium	µg/g	1.0	0.2	<0.2	<0.2
Chromium	µg/g	71	0.3	1.9	9.6
Cobalt	µg/g	21	0.2	1.8	6.5
Copper	µg/g	85	0.2	5.3	27.5
Lead	µg/g	120	0.3	0.6	2.1
Molybdenum	µg/g	2.5	0.3	<0.3	0.4
Nickel	µg/g	43	0.3	3.8	17.0
Selenium	µg/g	1.9	0.4	<0.4	<0.4
Silver	µg/g	0.42	0.2	<0.2	<0.2
Thallium	µg/g	2.5	0.2	<0.2	<0.2
Vanadium	µg/g	91	0.2	7.0	24.2
Zinc	µg/g	160	0.2	7.3	45.1
Electrical Conductivity (2:1)	mS/cm	0.57	0.002	0.052	0.220
Sodium Adsorption Ratio	N/A	2.4	N/A	0.081	0.170
pH 2:1 Water:Soil Extraction	N/A		N/A	7.47	7.46

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T1(All)

Certified By: Joshy Takeuchi

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AGAT WORK ORDER: 06T154730

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: Joyce Lastiwka

(P & T) BTEX - Soil

DATE SAMPLED: January 24 2006 **DATE RECEIVED:** February 01 2006 **DATE REPORTED:** February 08 2006 **SAMPLE TYPE:** Soil

	Unit	G / S	M.D.L.	BH1-1 494616	BH1-2 494617
Benzene	µg/g	0.002	0.001	<0.001	<0.001
Toluene	µg/g	0.002	0.002	<0.002	<0.002
Ethylbenzene	µg/g	0.002	0.002	<0.002	<0.002
m & p - Xylene	µg/g		0.002	<0.002	<0.002
o - Xylene	µg/g		0.002	<0.002	<0.002
Xylenes (Total)	µg/g	0.002	0.002	<0.002	<0.002

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T1(All)

Certified By:

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AGAT WORK ORDER: 06T154730

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: Joyce Lastiwka

O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil

DATE SAMPLED: January 24 2006 **DATE RECEIVED:** February 01 2006 **DATE REPORTED:** February 08 2006 **SAMPLE TYPE:** Soil

	Unit	G / S	M.D.L.	BH1-1 494616	BH1-2 494617
C6 - C10 (F1)	µg/g		5	<5	<5
C6 - C10 (F1 minus BTEX)	µg/g		5	<5	<5
C>10 - C16 (F2)	µg/g		10	<10	<10
C>16 - C34 (F3)	µg/g		50	<50	<50
C>34 - C50 (F4)	µg/g		50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA
Moisture Content	%		1	18.9	24.7

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard

Certified By:

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.
ATTENTION TO: Joyce Lastiwka

AGAT WORK ORDER:06T154730
PROJECT NO: R05-0226

Soil Analysis

RPT DATE: February 08 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153 Metals & pH, EC, SAR (Soil) - Table 1																
Antimony (µg/g)	1		< 0.8	< 0.8	0.0%	< 0.8	101%	90%	110%	87%	80%	120%	90%	70%	130%
Arsenic (µg/g)	1		3.87	4.99	25.3	< 0.3	108%	90%	110%	99%	90%	110%	92%	70%	130%
Barium (µg/g)	1		86.5	86.6	0.1%	< 0.2	102%	90%	110%	97%	90%	110%	94%	70%	130%
Beryllium (µg/g)	1		0.8	0.8	0.0%	< 0.2	92%	90%	110%	104%	90%	110%	93%	70%	130%
Cadmium (µg/g)	1		0.23	0.25	8.3%	< 0.2	101%	90%	110%	99%	90%	110%	99%	70%	130%
Chromium (µg/g)	1		24.5	24.3	0.8%	< 0.3	97%	90%	110%	98%	90%	110%	88%	70%	130%
Cobalt (µg/g)	1		12.1	12.4	2.4%	< 0.2	110%	90%	110%	97%	90%	110%	92%	70%	130%
Copper (µg/g)	1		19.7	18.9	4.1%	< 0.2	92%	90%	110%	100%	90%	110%	92%	70%	130%
Lead (µg/g)	1		22.6	26.0	14.0	< 0.3	94%	90%	110%	88%	80%	120%	85%	70%	130%
Molybdenum (µg/g)	1		0.4	0.4	0.0%	< 0.3	101%	90%	110%	107%	90%	110%	100%	70%	130%
Nickel (µg/g)	1		23.0	23.4	1.7%	< 0.3	103%	90%	110%	100%	90%	110%	93%	70%	130%
Selenium (µg/g)	1		< 0.4	< 0.4	0.0%	< 0.4	90%	90%	110%	108%	90%	110%	96%	70%	130%
Silver (µg/g)	1		< 0.2	< 0.2	0.0%	< 0.2	94%	90%	110%	79%	70%	130%	78%	70%	130%
Thallium (µg/g)	1		< 0.2	< 0.2	0.0%	< 0.2	101%	90%	110%	99%	90%	110%	97%	70%	130%
Vanadium (µg/g)	1		33.6	33.8	0.6%	< 0.2	101%	90%	110%	100%	90%	110%	87%	70%	130%
Zinc (µg/g)	1		116	123	5.9%	< 0.2	101%	90%	110%	106%	90%	110%	97%	70%	130%
Electrical Conductivity (2:1) (mS/cm)	1		0.493	0.490	0.6%	< 0.002	99%	90%	110%						
Sodium Adsorption Ratio (N/A)	1	494617	0.170	0.167	1.8%	N/A									
pH 2:1 Water:Soil Extraction (N/A)	1		9.68	9.45	2.4%	N/A	100%	90%	110%						

Certified By: Joby Takeuchi

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: Joyce Lastiwka

AGAT WORK ORDER:06T154730

PROJECT NO: R05-0226

Trace Organics Analysis

RPT DATE: February 08 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil															
C6 - C10 (F1) (µg/g)	1	494617	< 5	< 5	0.0%	< 5	73%	60%	140%	81%	60%	140%		60%	140%
C>10 - C16 (F2) (µg/g)	1	494263	< 10	< 10	0.0%	< 10	93%	60%	140%	105%	60%	140%	103%	50%	140%
C>16 - C34 (F3) (µg/g)	1	494263	< 50	< 50	0.0%	< 50	91%	60%	140%	128%	60%	140%	123%	60%	140%
C>34 - C50 (F4) (µg/g)	1	494263	< 50	< 50	0.0%	< 50	96%	60%	140%	105%	60%	140%	73%	60%	140%
(P & T) BTEX - Soil															
Benzene (µg/g)	1	494617	< 0.001	< 0.001	0.0%	< 0.001	104%	60%	140%	93%	60%	140%	99%	60%	140%
Toluene (µg/g)	1	494617	< 0.002	< 0.002	0.0%	< 0.002	108%	60%	140%	94%	60%	140%	108%	60%	140%
Ethylbenzene (µg/g)	1	494617	< 0.002	< 0.002	0.0%	< 0.002	108%	60%	140%	93%	60%	140%	101%	60%	140%
m & p - Xylene (µg/g)	1	494617	< 0.002	< 0.002	0.0%	< 0.002	108%	60%	140%	92%	60%	140%	115%	60%	140%
o - Xylene (µg/g)	1	494617	< 0.002	< 0.002	0.0%	< 0.002	107%	60%	140%	93%	60%	140%	115%	60%	140%

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Method Summary

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: Joyce Lastiwka

AGAT WORK ORDER:06T154730

PROJECT NO: R05-0226

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Parameters			
Antimony	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Arsenic	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Barium	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Beryllium	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Cadmium	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Chromium	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Cobalt	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Copper	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Lead	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Molybdenum	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Nickel	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Selenium	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Silver	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Thallium	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Vanadium	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Zinc	MET 1003	EPA SW 846 3050B & 6020	ICP-MS
Electrical Conductivity (2:1)	INOR 1036	McKeague 3.12, SM 2510 B	EC Meter
Sodium Adsorption Ratio	INOR 1007	EPA SW 846 6010 C, McKeague 3.26	ICP-OES
pH 2:1 Water:Soil Extraction	INOR 1031	McKeague 3.13, SM4500 H+	pH METER
Trace Organics Parameters			
Benzene	VOL 5008	EPA SW-846 5030B & 8015	GC / FID (P & T)
Toluene	VOL 5008	EPA SW-846 5030B & 8015	GC/FID (P & T)
Ethylbenzene	VOL 5008	EPA SW-846 5030B & 8015	GC/FID (P & T)
m & p - Xylene	VOL - 5008	EPA SW - 846 5030B/8015	GC / FID (P & T)
o - Xylene	VOL - 5008	EPA SW - 846 5030B/8015	GC / FID (P & T)
Xylenes (Total)	VOL 5008	EPA SW-846 5030B & 8015	GC/FID (P & T)
C6 - C10 (F1)	VOL - 5009	CCME Tier 1 Method	GC / FID
C6 - C10 (F1 minus BTEX)	VOL - 5009	CCME Tier 1 Method	GC / FID
C>10 - C16 (F2)	VOL - 5009	CCME Tier 1 Method	GC / FID
C>16 - C34 (F3)	VOL - 5009	CCME Tier 1 Method	GC / FID
C>34 - C50 (F4)	VOL - 5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL - 5009	CCME Tier 1 Method	GRAVIMETRIC ANALYSIS
Moisture Content			

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CLIENT: **ECOPLANS LTD.**
2655 North Sheridan Way
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ATTENTION: **DEREK STEWART**

CLIENT PROJECT # / NAME: **R05-0226**

AGAT WORK ORDER: **06T159347**

SOIL ANALYSIS REVIEWED BY: **Elizabeth Polakowska, Analyst**

TRACE ORGANICS REVIEWED BY: **Irina Romanova, Irina Romanova, BSc.**

DATE REPORTED: **March 10, 2006**

PAGES (INCLUDING COVER): **9**

Should you require any information regarding this analysis please contact your client services representative at (905) 501 9998 or by email at env@agatlabs.com

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 06T159347
PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg. 153 Metals & Inorganics in Soil

DATE SAMPLED: February 27 2006 **DATE RECEIVED:** March 06 2006 **DATE REPORTED:** March 10 2006 **SAMPLE TYPE:** Soil

	Unit	G / S	M.D.L.	EBH12-02 500453	EBH12-04 500454	EBH13-03 500456	EBH13-05 500458	EBH14-07 500459	EBH18-07 500460	EBH14-05 500461
Antimony	µg/g	40	1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Arsenic	µg/g	40	0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Barium	µg/g	1500	0.3	31.0	61.2	46.3	130	9.7	11.0	8.7
Beryllium	µg/g	1.2	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Cadmium	µg/g	12	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	µg/g	750	0.6	7.8	6.1	9.4	11.4	6.0	2.8	3.1
Cobalt	µg/g	80	0.3	2.6	3.0	4.9	7.9	1.4	1.3	1.4
Copper	µg/g	225	0.3	14.9	8.4	19.1	26.1	4.9	3.8	4.4
Lead	µg/g	1000	0.5	1.2	1.1	1.8	1.4	0.5	0.5	0.6
Molybdenum	µg/g	40	0.5	<0.5	<0.5	0.9	0.9	1.1	<0.5	<0.5
Nickel	µg/g	150	0.6	8.0	6.8	12.4	20.4	3.9	3.3	3.2
Selenium	µg/g	10	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Silver	µg/g	40	0.4	<0.4	<0.4	0.9	<0.4	<0.4	<0.4	<0.4
Thallium	µg/g	32	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vanadium	µg/g	200	0.4	19.9	15.9	22.7	30.5	8.6	8.3	8.1
Zinc	µg/g	600	0.4	13.5	13.6	25.0	50.5	6.6	6.4	7.0
Electrical Conductivity (2:1)	mS/cm	1.4	0.002	0.022	0.022	0.048	0.089	0.071	0.015	0.021
Sodium Adsorption Ratio	N/A	12	N/A	0.153	0.280	0.316	0.308	0.135	0.115	0.059
pH 2:1 Water:Soil Extraction	N/A		N/A	5.33	5.56	5.58	6.90	7.09	6.37	6.38

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(ICC)

Certified By: Elizabeth Rolakowska

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AGAT WORK ORDER: 06T159347
PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil

DATE SAMPLED: February 27 2006 **DATE RECEIVED:** March 06 2006 **DATE REPORTED:** March 10 2006 **SAMPLE TYPE:** Soil

	Unit	G / S	M.D.L.	EBH12-02 500453	EBH12-04 500454	EBH13-03 500456	EBH16-03 500457	EBH13-05 500458	EBH14-07 500459	EBH14-05 500461
Benzene	µg/g	0.24	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	µg/g	2.1	0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g	0.28	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes (Total)	µg/g	25	0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
C6 - C10 (F1)	µg/g		5	<5	<5	<5	<5	<5	<5	<5
C6 - C10 (F1 minus BTEX)	µg/g	230	5	<5	<5	<5	<5	<5	<5	<5
C>10 - C16 (F2)	µg/g	150	10	<10	<10	<10	<10	<10	<10	<10
C>16 - C34 (F3)	µg/g	1700	50	<50	<50	<50	<50	<50	<50	<50
C>34 - C50 (F4)	µg/g	3300	50	<50	<50	<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		1	17.6	17.1	5.3	12.5	1.9	14.6	9.4

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 06T159347
PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil

DATE SAMPLED: February 27 2006 **DATE RECEIVED:** March 06 2006 **DATE REPORTED:** March 10 2006 **SAMPLE TYPE:** Soil

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(ICC)

500453
Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

500454
Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

500456
Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

500457
Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.

Certified By:

O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil

DATE SAMPLED: February 27 2006 | DATE RECEIVED: March 06 2006 | DATE REPORTED: March 10 2006 | SAMPLE TYPE: Soil

Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

500458

Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

500459

Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

500461

Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.

Certified By:

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AGAT WORK ORDER: 06T159347
PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil

DATE SAMPLED: February 27 2006 **DATE RECEIVED:** March 06 2006 **DATE REPORTED:** March 10 2006 **SAMPLE TYPE:** Soil

Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By:

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.

PROJECT NO: R05-0226

AGAT WORK ORDER:06T159347

ATTENTION TO: DEREK STEWART

Soil Analysis

RPT DATE: March 10 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153 Metals & Inorganics in Soil															
Antimony (µg/g)	1	500458	< 1.6	< 1.6	0.0%	< 1.6	106%	90%	110%	88%	80%	120%	94%	70%	130%
Arsenic (µg/g)	1	500458	< 0.6	< 0.6	0.0%	< 0.6	100%	90%	110%	102%	80%	120%	96%	70%	130%
Barium (µg/g)	1	500458	130	126	3.1%	< 0.3	96%	80%	120%	98%	80%	120%	98%	70%	130%
Beryllium (µg/g)	1	500458	< 0.4	< 0.4	0.0%	< 0.4	96%	90%	110%	105%	80%	120%	106%	70%	130%
Cadmium (µg/g)	1	500458	< 0.4	< 0.4	0.0%	< 0.4	93%	90%	110%	103%	80%	120%	98%	70%	130%
Chromium (µg/g)	1	500458	11.4	11.0	3.6%	< 0.6	101%	90%	110%	100%	80%	120%	92%	70%	130%
Cobalt (µg/g)	1	500458	7.9	7.4	6.5%	< 0.3	110%	90%	110%	100%	80%	120%	94%	70%	130%
Copper (µg/g)	1	500458	26.1	26.0	0.4%	< 0.3	101%	90%	110%	99%	80%	120%	90%	70%	130%
Lead (µg/g)	1	500458	1.4	1.4	0.0%	< 0.5	106%	90%	110%	89%	80%	120%	87%	70%	130%
Molybdenum (µg/g)	1	500458	0.9	0.8	11.8%	< 0.5	101%	90%	110%	100%	80%	120%	104%	70%	130%
Nickel (µg/g)	1	500458	20.4	19.1	6.6%	< 0.6	105%	90%	110%	100%	80%	120%	94%	70%	130%
Selenium (µg/g)	1	500458	< 0.8	< 0.8	0.0%	< 0.8	102%	90%	110%	108%	80%	120%	99%	70%	130%
Silver (µg/g)	1	500458	< 0.4	< 0.4	0.0%	< 0.4	96%	90%	110%	98%	80%	120%	99%	70%	130%
Thallium (µg/g)	1	500458	< 0.4	< 0.4	0.0%	< 0.4	104%	90%	110%	97%	80%	120%	97%	70%	130%
Vanadium (µg/g)	1	500458	30.5	29.2	4.4%	< 0.4	98%	90%	110%	102%	80%	120%	97%	70%	130%
Zinc (µg/g)	1	500458	50.5	46.5	8.2%	< 0.4	108%	90%	110%	109%	80%	120%	107%	70%	130%
Electrical Conductivity (2:1) (mS/cm)	1	500454	0.022	0.022	0.0%	< 0.002	97%	90%	110%						
Sodium Adsorption Ratio (N/A)	1	500454	0.280	0.278	0.7%	N/A									
pH 2:1 Water:Soil Extraction (N/A)	1	500454	5.56	5.56	0.0%	N/A	100%	90%	110%						

Certified By: Elizabeth Rolokowska

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Quality Assurance

CLIENT NAME: ECOPLANS LTD.

AGAT WORK ORDER:06T159347

PROJECT NO: R05-0226

ATTENTION TO: DEREK STEWART

Trace Organics Analysis

RPT DATE: March 10 2006			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup. #1	Dup. #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil															
C>10 - C16 (F2) (µg/g)	1	500021	26	33	23.7%	< 10	105%	60%	140%	99%	60%	140%	95%	50%	140%
C>16 - C34 (F3) (µg/g)	1	500021	220	260	16.7%	< 50	102%	60%	140%	101%	60%	140%	114%	60%	140%
C>34 - C50 (F4) (µg/g)	1	500021	51	50	2.0%	< 50	107%	60%	140%	104%	60%	140%	111%	60%	140%
O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil															
Benzene (µg/g)	1	500454	< 0.10	< 0.10	0.0%	< 0.10	100%	60%	140%	97%	60%	140%	108%	60%	140%
Toluene (µg/g)	1	500454	< 0.08	< 0.08	0.0%	< 0.08	103%	60%	140%	104%	60%	140%	128%	60%	140%
Ethylbenzene (µg/g)	1	500454	< 0.05	< 0.05	0.0%	< 0.05	104%	60%	140%	102%	60%	140%	128%	60%	140%
Xylenes (Total) (µg/g)	1	500454	< 0.07	< 0.07	0.0%	< 0.07	105%	60%	140%	103%	60%	140%	116%	60%	140%
C6 - C10 (F1) (µg/g)	1	500454	< 5	< 5	0.0%	< 5	73%	60%	140%	73%	60%	140%	87%	60%	140%

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Method Summary

CLIENT NAME: ECOPLANS LTD.

AGAT WORK ORDER:06T159347

PROJECT NO: R05-0226

ATTENTION TO: DEREK STEWART

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Parameters			
Antimony	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Arsenic	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Barium	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Beryllium	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Cadmium	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Chromium	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Cobalt	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Copper	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Lead	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Molybdenum	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Nickel	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Selenium	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Silver	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Thallium	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Vanadium	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Zinc	MET 1003	EPA SW 846 3050B & 6020	ICP/MS
Electrical Conductivity (2:1)	INOR 1036	McKeague 3.12, SM 2510 B	EC Meter
Sodium Adsorption Ratio	INOR 1007	McKeague 3.26, EPA SW 846 & 6010 C	CALCULATION
pH 2:1 Water:Soil Extraction	INOR 1031	McKeague 3.13, SM 4500 H+	pH METER
Trace Organics Parameters			
Benzene	VOL 5002	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL 5002	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL 5002	EPA SW-846 5035 & 8260	P & T GC/MS
Xylenes (Total)	VOL 5008	EPA SW-846 5030B & 8015	GC/FID (P & T)
C6 - C10 (F1)	VOL - 5009	CCME Tier 1 Method	GC / FID
C6 - C10 (F1 minus BTEX)	VOL - 5009	CCME Tier 1 Method	GC / FID
C>10 - C16 (F2)	VOL - 5009	CCME Tier 1 Method	GC / FID
C>16 - C34 (F3)	VOL - 5009	CCME Tier 1 Method	GC / FID
C>34 - C50 (F4)	VOL - 5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL - 5009	CCME Tier 1 Method	GRAVIMETRIC ANALYSIS
Moisture Content			

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AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW1 521134	EMW2 521135	EMW3 521144	EMW4 521153	EMW5 521162	EMW6 521171	EMW7 521180	EMW8 521189
Benzene	µg/L	5.0	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	µg/L	24	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	µg/L	2.4	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	µg/L	300	0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
C6 - C10 (F1)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
C6 - C10 (F1 minus BTEX)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
C>10 - C16 (F2)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
C6 - C16 (F1 + F2)	µg/L	1000	100	<100	<100	<100	<100	<100	<100	<100	<100
C>16 - C34 (F3)	µg/L		500	<500	<500	<500	<500	<500	<500	<500	<500
C>34 - C50	µg/L		500	<500	<500	<500	<500	<500	<500	<500	<500
C>16 - C50 (F3 + F4)	µg/L	1000	500	<500	<500	<500	<500	<500	<500	<500	<500
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA	NA	NA	NA	NA	NA

	Unit	G / S	M.D.L.	EMW9 521198	EMW10 521207	EMW11 521216	EMW12 521225	EBW12 521233	EBW13 521244	EMW14 521255	EBW14 521266
Benzene	µg/L	5.0	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	µg/L	24	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	µg/L	2.4	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	µg/L	300	0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
C6 - C10 (F1)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
C6 - C10 (F1 minus BTEX)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
C>10 - C16 (F2)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
C6 - C16 (F1 + F2)	µg/L	1000	100	<100	<100	<100	<100	<100	<100	<100	<100
C>16 - C34 (F3)	µg/L		500	<500	<500	<500	<500	<500	<500	<500	<500
C>34 - C50	µg/L		500	<500	<500	<500	<500	<500	<500	<500	<500
C>16 - C50 (F3 + F4)	µg/L	1000	500	<500	<500	<500	<500	<500	<500	<500	<500
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA	NA	NA	NA	NA	NA

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW15 521278	EMW16 521288	EMW17 521299
Benzene	µg/L	5.0	0.2	<0.2	<0.2	<0.2
Toluene	µg/L	24	0.2	<0.2	<0.2	<0.2
Ethylbenzene	µg/L	2.4	0.1	<0.1	<0.1	<0.1
Xylenes (Total)	µg/L	300	0.14	<0.14	<0.14	<0.14
C6 - C10 (F1)	µg/L		100	<100	<100	<100
C6 - C10 (F1 minus BTEX)	µg/L		100	<100	<100	<100
C>10 - C16 (F2)	µg/L		100	<100	<100	<100
C6 - C16 (F1 + F2)	µg/L	1000	100	<100	<100	<100
C>16 - C34 (F3)	µg/L		500	<500	<500	<500
C>34 - C50	µg/L		500	<500	<500	<500
C>16 - C50 (F3 + F4)	µg/L	1000	500	<500	<500	<500
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

521134
Result for F1(C6-C10) were revised on May 30, 2006.
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Note: F1(C6-C10) value is not due to gasoline. Unknown peaks contributed to this value.
The result for F1(C6-C10) was revised on May 25, 2006.

521135
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521144
Result for F1(C6-C10) were revised on May 25, 2006.
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Note: F1(C6-C10) value is not due to gasoline. Unknown peaks contributed to this value.
The result for F1(C6-C10) was revised on May 25, 2006.

521153
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.

Certified By:

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521162 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521171 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521180 Result for F1(C6-C10) were revised on May 30, 2006.
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Note: F1(C6-C10) value is not due to gasoline. Unknown peaks contributed to this value.
The result for F1(C6-C10) was revised on May 25, 2006.

521189 Result for F1(C6-C10) were revised on May 25, 2006.
The C6-C10 fraction is calculated using Toluene response factor.

Certified By:

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Note: F1(C6-C10) value is not due to gasoline. Unknown peaks contributed to this value.

521198 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521207 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521216 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

521225
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521233
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521244
Result for F1(C6-C10) were revised on May 25, 2006.
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Note: F1(C6-C10) value is not due to gasoline. Unknown peaks contributed to this value.

521255
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By:

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521266

The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521278

Result for F1(C6-C10) were revised on May 25, 2006.
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521288

The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

521299

The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By:

AGAT® Laboratories

Certificate of Analysis

AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:

AGAT® Laboratories

Certificate of Analysis

AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

Metals in water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW1 521134	EMW2 521135	EMW3 521144	EMW4 521153	EMW5 521162	EMW6 521171	EMW7 521180	EMW8 521189
Aluminum	µg/L		1.00	133	75.0	25.2	14.5	28.4	65.2	24.3	99.9
Antimony	ug/L	6.0	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	ug/L	25	0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Barium	ug/L	1000	0.50	18.2	22.3	24.1	7.14	19.9	15.8	5.90	15.6
Beryllium	ug/L	4.0	1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	ug/L		0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	ug/L	5000	10.0	<10.0	<10.0	14.5	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium	ug/L	5.0	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	ug/L	50	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Cobalt	ug/L	100	0.50	12.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.96
Copper	ug/L	23	0.80	5.80	5.96	5.31	5.72	6.28	6.25	6.03	7.62
Iron	ug/L		2.00	10600	34.9	60.4	8.88	12.2	23.2	20.5	22.7
Lead	ug/L	10	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese	ug/L		0.60	387	6.07	70.0	2.91	9.25	10.7	4.76	13.0
Molybdenum	ug/L	7300	0.50	<0.50	<0.50	15.8	<0.50	<0.50	<0.50	<0.50	<0.50
Nickel	ug/L	100	1.00	<1.00	1.00	7.35	<1.00	<1.00	<1.00	<1.00	1.17
Selenium	ug/L	10	0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Silver	ug/L	1.2	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium	ug/L	200000	100	1720	982	49500	1460	1330	1430	1240	1120
Thallium	ug/L	2.0	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	ug/L		1.00	1.48	<1.00	1.91	<1.00	<1.00	<1.00	<1.00	<1.00
Uranium	ug/L		0.20	<0.20	<0.20	0.36	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	ug/L	200	0.40	0.69	<0.40	2.68	<0.40	<0.40	<0.40	<0.40	<0.40
Zinc	ug/L	1100	1.00	11.6	9.99	8.04	10.6	14.1	15.2	12.5	20.9

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AGAT® Laboratories

Certificate of Analysis

AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

Metals in water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW9 521198	EMW10 521207	EMW11 521216	EMW12 521225	EBW12 521233	EBW13 521244	EMW14 521255	EBW14 521266
Aluminum	µg/L		1.00	105	16.5	17.1	26.1	34.9	3.41	22.8	9.65
Antimony	ug/L	6.0	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic	ug/L	25	0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Barium	ug/L	1000	0.50	5.12	8.38	9.44	25.3	7.10	89.0	13.1	131
Beryllium	ug/L	4.0	1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
Bismuth	ug/L		0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	ug/L	5000	10.0	<10.0	<10.0	<10.0	<10.0	207	152	10.6	51.6
Cadmium	ug/L	5.0	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	ug/L	50	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Cobalt	ug/L	100	0.50	<0.50	<0.50	1.38	1.15	<0.50	<0.50	<0.50	<0.50
Copper	ug/L	23	0.80	6.99	5.86	6.36	2.36	0.96	1.39	5.76	1.05
Iron	ug/L		2.00	50.1	14.6	21.9	21.7	32.1	45.6	20.1	45.5
Lead	ug/L	10	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese	ug/L		0.60	9.16	18.5	30.6	45.8	4.56	41.6	26.9	13.9
Molybdenum	ug/L	7300	0.50	0.81	<0.50	<0.50	12.9	183	8.65	<0.50	4.13
Nickel	ug/L	100	1.00	<1.00	<1.00	1.13	4.77	1.13	<1.00	<1.00	<1.00
Selenium	ug/L	10	0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Silver	ug/L	1.2	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium	ug/L	200000	100	6120	1150	1500	9100	49200	24500	1150	14900
Thallium	ug/L	2.0	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	ug/L		1.00	1.53	<1.00	<1.00	<1.00	1.27	<1.00	<1.00	<1.00
Uranium	ug/L		0.20	<0.20	<0.20	<0.20	<0.20	0.53	0.22	<0.20	<0.20
Vanadium	ug/L	200	0.40	<0.40	<0.40	<0.40	<0.40	2.02	0.64	<0.40	<0.40
Zinc	ug/L	1100	1.00	11.9	15.6	12.8	7.38	1.87	1.66	15.0	3.24

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

Metals in water

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW15 521278	EMW16 521288	EMW17 521299
Aluminum	µg/L		1.00	7.11	28.0	7.49
Antimony	ug/L	6.0	1.00	<1.00	<1.00	<1.00
Arsenic	ug/L	25	0.60	<0.60	<0.60	<0.60
Barium	ug/L	1000	0.50	23.2	25.8	<0.50
Beryllium	ug/L	4.0	1.50	<1.50	<1.50	<1.50
Bismuth	ug/L		0.50	<0.50	<0.50	<0.50
Boron	ug/L	5000	10.0	17.5	<10.0	<10.0
Cadmium	ug/L	5.0	0.50	<0.50	<0.50	<0.50
Chromium	ug/L	50	1.00	<1.00	<1.00	<1.00
Cobalt	ug/L	100	0.50	<0.50	1.15	<0.50
Copper	ug/L	23	0.80	1.60	3.86	<0.80
Iron	ug/L		2.00	46.8	22.0	2.85
Lead	ug/L	10	0.50	<0.50	<0.50	<0.50
Manganese	ug/L		0.60	71.8	46.8	<0.60
Molybdenum	ug/L	7300	0.50	16.0	12.9	<0.50
Nickel	ug/L	100	1.00	6.53	4.81	<1.00
Selenium	ug/L	10	0.80	<0.80	<0.80	<0.80
Silver	ug/L	1.2	0.50	<0.50	<0.50	<0.50
Sodium	ug/L	200000	100	50200	9070	157
Thallium	ug/L	2.0	0.30	<0.30	<0.30	<0.30
Titanium	ug/L		1.00	1.30	<1.00	<1.00
Uranium	ug/L		0.20	0.89	<0.20	<0.20
Vanadium	ug/L	200	0.40	2.60	<0.40	<0.40
Zinc	ug/L	1100	1.00	3.01	18.2	<1.00

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

Certified By:

AGAT® Laboratories

Certificate of Analysis

AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

Water Analysis - Inorganics

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW1 521134	EMW2 521135	EMW3 521144	EMW4 521153	EMW5 521162	EMW6 521171	EMW7 521180	EMW8 521189
Electrical Conductivity	uS/cm		2	42	32	351	23	32	27	22	24
Fluoride	mg/L		0.05	<0.05	<0.05	0.20	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	mg/L	250	0.10	1.45	0.87	3.72	1.44	1.34	1.28	1.05	1.01
Bromide	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	10	0.05	<0.05	0.07	0.36	0.06	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L	1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	mg/L		0.10	6.04	8.18	105	4.04	6.59	5.53	5.20	5.40
Ammonia as N	mg/L		0.02	0.14	<0.02	0.06	0.02	0.03	<0.02	0.02	0.02
Total Kjeldahl Nitrogen	mg/L		0.10	0.59	1.93	0.18	0.69	0.31	0.29	0.36	1.88

	Unit	G / S	M.D.L.	EMW9 521198	EMW10 521207	EMW11 521216	EMW15 521278	EMW17 521299
Electrical Conductivity	uS/cm		2	46	26	41	368	<2
Fluoride	mg/L		0.05	<0.05	<0.05	<0.05	0.20	<0.05
Chloride	mg/L	250	0.10	1.16	0.93	1.38	3.91	<0.10
Bromide	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	10	0.05	<0.05	0.23	<0.05	0.29	<0.05
Nitrite as N	mg/L	1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	mg/L		0.10	10.4	6.03	6.81	107	<0.10
Ammonia as N	mg/L		0.02	0.04	<0.02	<0.02	0.14	<0.02
Total Kjeldahl Nitrogen	mg/L		0.10	0.60	0.15	0.30	0.19	<0.10

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 06T168812

PROJECT NO: R05-0226

CLIENT NAME: ECOPLANS LTD.

ATTENTION TO: DEREK STEWART

Water Analysis - Inorganics incl.TOC, CN, TSS, pH & Hardness

DATE SAMPLED: May 09 2006 **DATE RECEIVED:** May 11 2006 **DATE REPORTED:** May 30 2006 **SAMPLE TYPE:** Water

	Unit	G / S	M.D.L.	EMW12 521225	EBW12 521233	EBW13 521244	EMW14 521255	EBW14 521266	EMW16 521288
Fluoride	mg/L		0.05	<0.05	0.50	0.44	<0.05	0.13	<0.05
Chloride	mg/L	250	0.10	1.85	2.28	6.92	0.82	1.03	1.84
Bromide	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	10	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L	1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	mg/L		0.10	20.6	14.5	11.0	5.62	19.4	20.4
Ammonia as N	mg/L		0.02	0.07	0.04	0.02	<0.02	0.07	0.02
Total Kjeldahl Nitrogen	mg/L		0.10	0.94	0.13	0.11	0.14	0.17	1.14
Total Phosphorus	mg/L		0.05	4.70	<0.05	<0.05	0.20	<0.05	4.76
Total Organic Carbon *	mg/L		1	29	1	<1	6	<1	43
Cyanide Free	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
pH	N/A		N/A	7.51	8.93	8.08	6.78	8.26	7.22
Total Hardness	mg/L CaCO3			17.3	21.2	55.5	8.9	50.6	18.0
Total Suspended Solids	mg/L		12	5640	22	<12	174	<12	12400

Comments: M.D.L. - Method Detection Limit; G / S - Guideline / Standard: Refers to T2(PGW)

Certified By:

APPENDIX E

LABORATORY GRAIN SIZE AND MOISTURE CONTENT ANALYSIS

Laboratory Test Results for Project # R050226

Hydrometer Analysis:

Particle Size (mm)	EBW13-2	Particle Size (mm)	EBW12-2	Particle Size (mm)	EMW12-2	Particle Size (mm)	EMW12-3
12.5	100	**12.5**	100	**12.5**	100	**12.5**	100
9.5	98.0	**9.5**	100	**9.5**	100	**9.5**	100
4.75	96.6	**4.75**	100	**4.75**	99.9	**4.75**	100
2.0	93.4	**2.0**	99.8	**2.0**	99.6	**2.0**	100
0.85	90.2	**0.85**	98.7	**0.85**	99.0	**0.85**	99.8
0.425	87.8	**0.425**	98.2	**0.425**	98.8	**0.425**	99.7
0.25	86.4	**0.25**	97.9	**0.25**	98.5	**0.25**	99.6
0.15	84.4	**0.15**	97.3	**0.15**	95.7	**0.15**	99.3
0.075	69.3	**0.075**	86.3	**0.075**	81.3	**0.075**	92.8
0.0422	42.5	**0.0417**	52.6	**0.0397**	54.4	**0.041**	57.0
0.0324	30.3	**0.0322**	37.4	**0.0306**	41.9	**0.0317**	41.3
0.0222	16.3	**0.0221**	20.1	**0.0213**	25.0	**0.022**	21.4
0.0133	8.8	**0.0133**	11.1	**0.0131**	12.6	**0.0133**	10.8
0.0095	7.0	**0.0095**	8.4	**0.0094**	8.8	**0.0095**	7.2
0.0067	5.9	**0.0067**	7.0	**0.0067**	7.6	**0.0068**	5.1
0.0048	4.7	**0.0048**	5.6	**0.0048**	6.3	**0.0048**	4.4
0.0034	3.6	**0.0034**	4.2	**0.0034**	5.1	**0.0034**	3.6
0.0024	3.0	**0.0024**	3.5	**0.0024**	3.8	**0.0024**	2.9
0.0014	2.4	**0.0014**	2.9	**0.0014**	2.6	**0.0014**	2.9

Sieve Analysis Results:

Particle Sizes (mm)	EWM 14-3	EBW 14-6	EBW 14-2	EBW 13-5	EMW 13-5
37.5	100	100	100	100	100
26.5	100	100	100	92.8	89.4
19.0	100	100	100	78.6	77.8
13.2	100	100	100	69.0	68.6
9.5	100	100	99.0	62.0	63.5
4.75	100	100	98.8	53.8	54.4
2.36	99.9	99.4	98.4	47.2	48.5
1.18	99.7	98.1	97.8	41.5	43.7
0.600	97.5	87.8	95.8	33.8	35.0
0.300	81.0	59.9	81.6	23.5	22.3
0.150	25.4	16.4	37.5	13.3	11.3
0.075	4.3	1.1	9.0	7.2	5.8

Moisture Content Results:

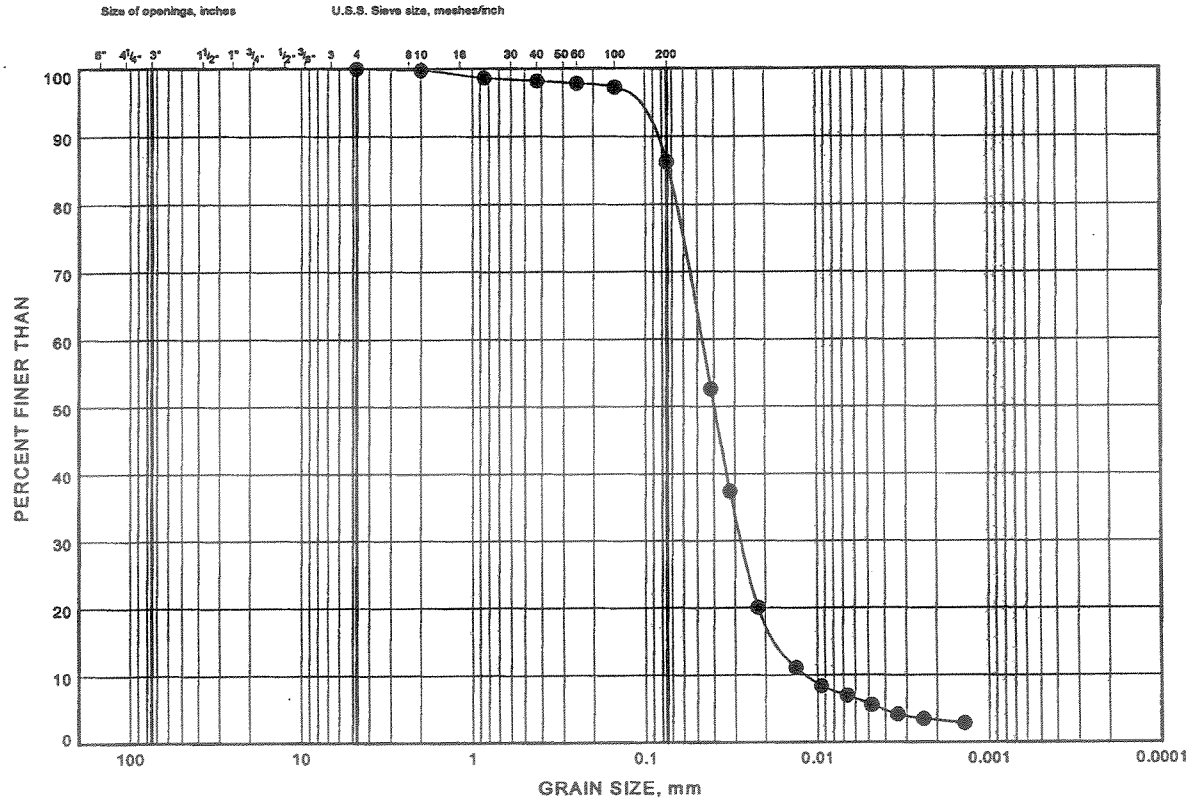
Location	% Moisture Content	Location	% Moisture Content
EMW 14-3	25.97	EBW 13-2	21.48
EBW 14-6	19.68	EBW 12-2	19.47
EBW 14-2	21.19	EMW 12-2	24.35
EBW 13-5	2.21	EMW 12-3	24.10
EMW 13-5	6.01		

Laboratory Testing for Project # R050226

GRAIN SIZE DISTRIBUTION

FIGURE 1

SILT, some sand, trace clay



COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
	GRAVEL		SAND			FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EBW12-2	4.57~5.18	

Date March 2006

Project 19-4378-1

THURBER

Prep'd EA

Chkd. WM

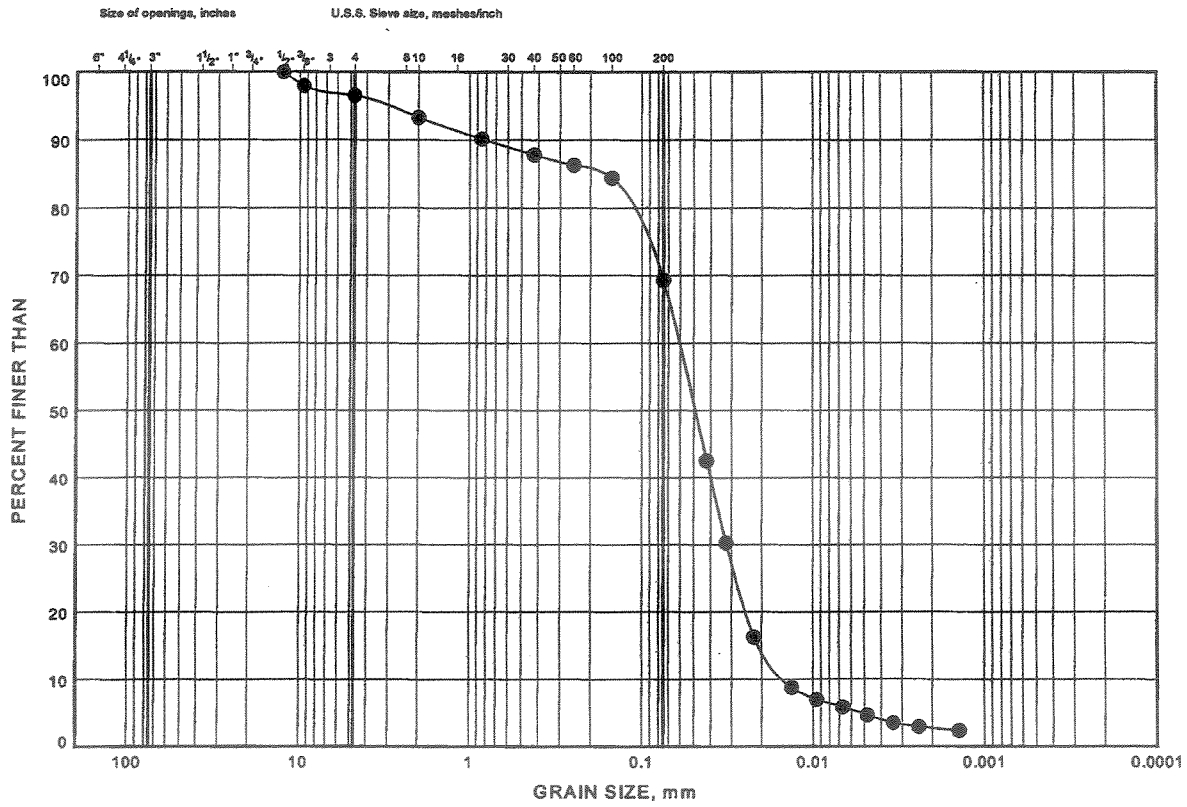
THURBGSD 3781.GPJ 30/03/06

Laboratory Testing for Project # R050226

GRAIN SIZE DISTRIBUTION

FIGURE 2

Sandy SILT, trace gravel, trace clay



COBBLE SIZE	GRAVEL		SAND			SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EBW13-2	0.76~1.37	

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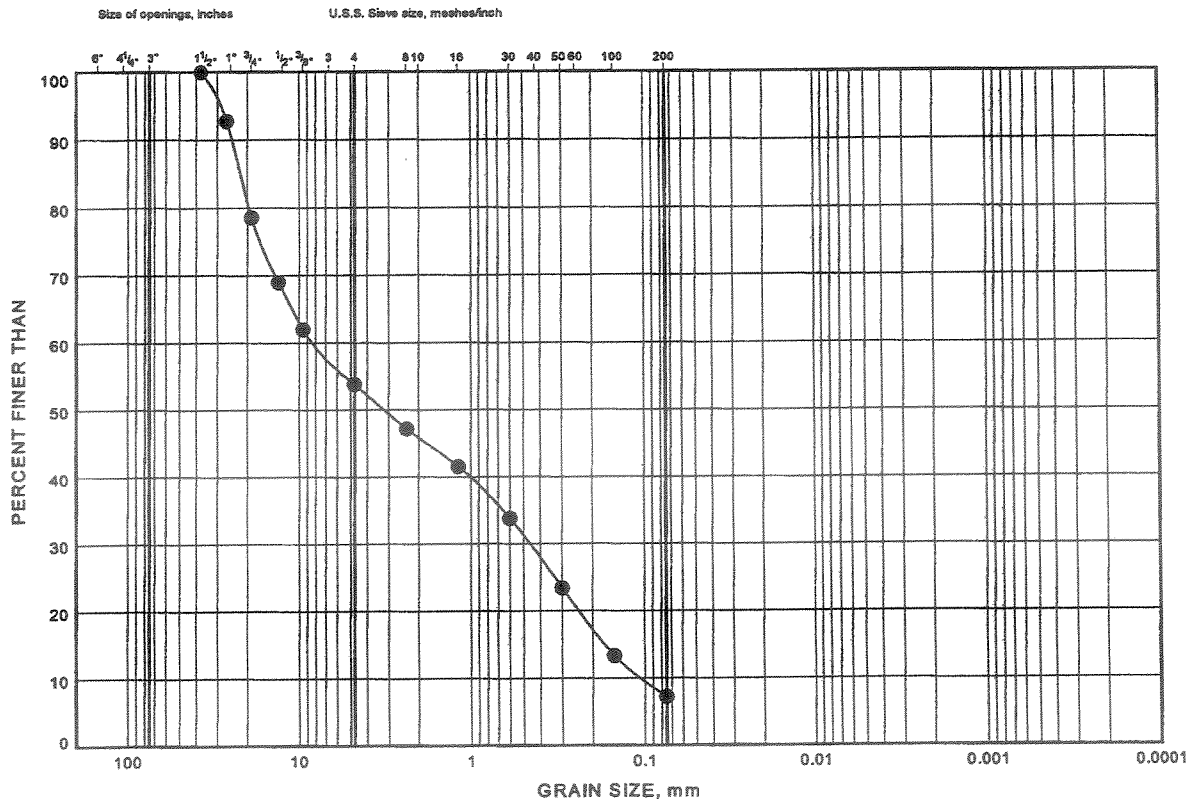
GRAIN SIZE DISTRIBUTION

FIGURE 3

SAND and GRAVEL, trace silt



COBBLE SIZE	GRAVEL		SAND			SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EBW13-5	2.29~2.90	

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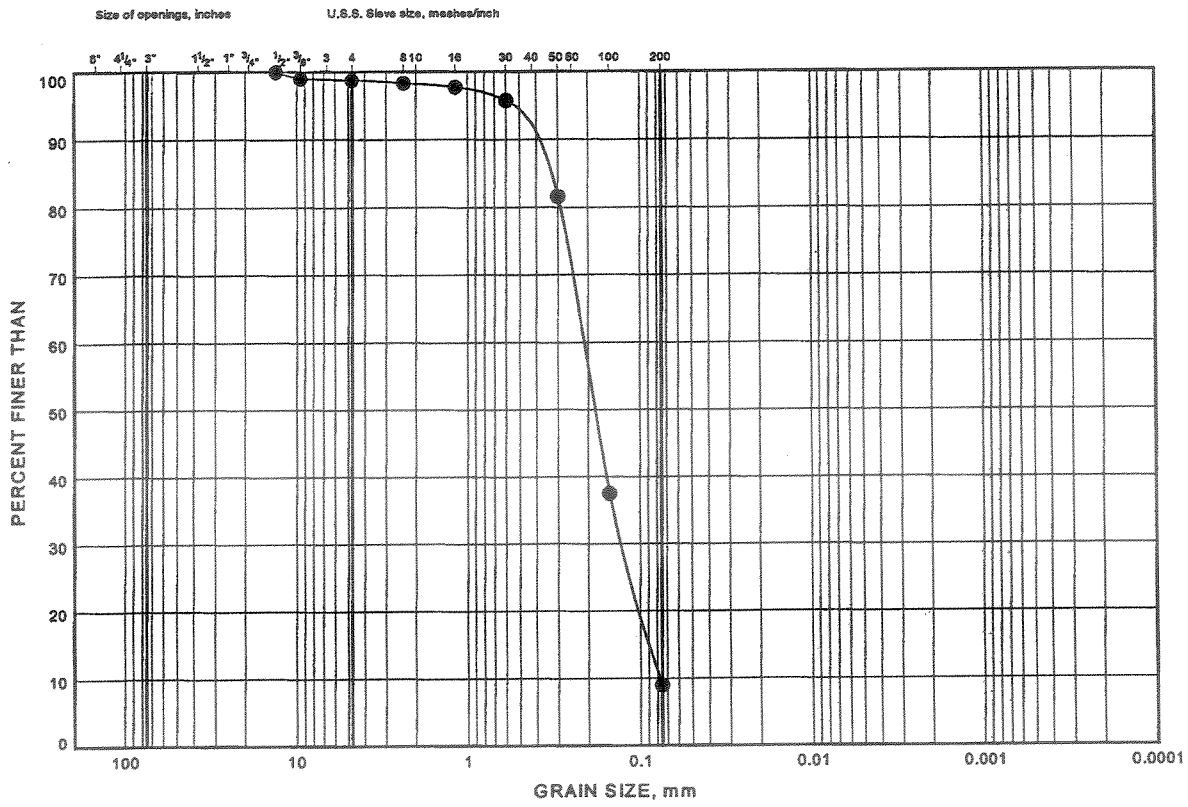
GRAIN SIZE DISTRIBUTION

FIGURE 4

SAND, trace gravel, trace silt



COBBLE SIZE	GRAVEL		SAND			SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EBW14-2	0.76~1.37	

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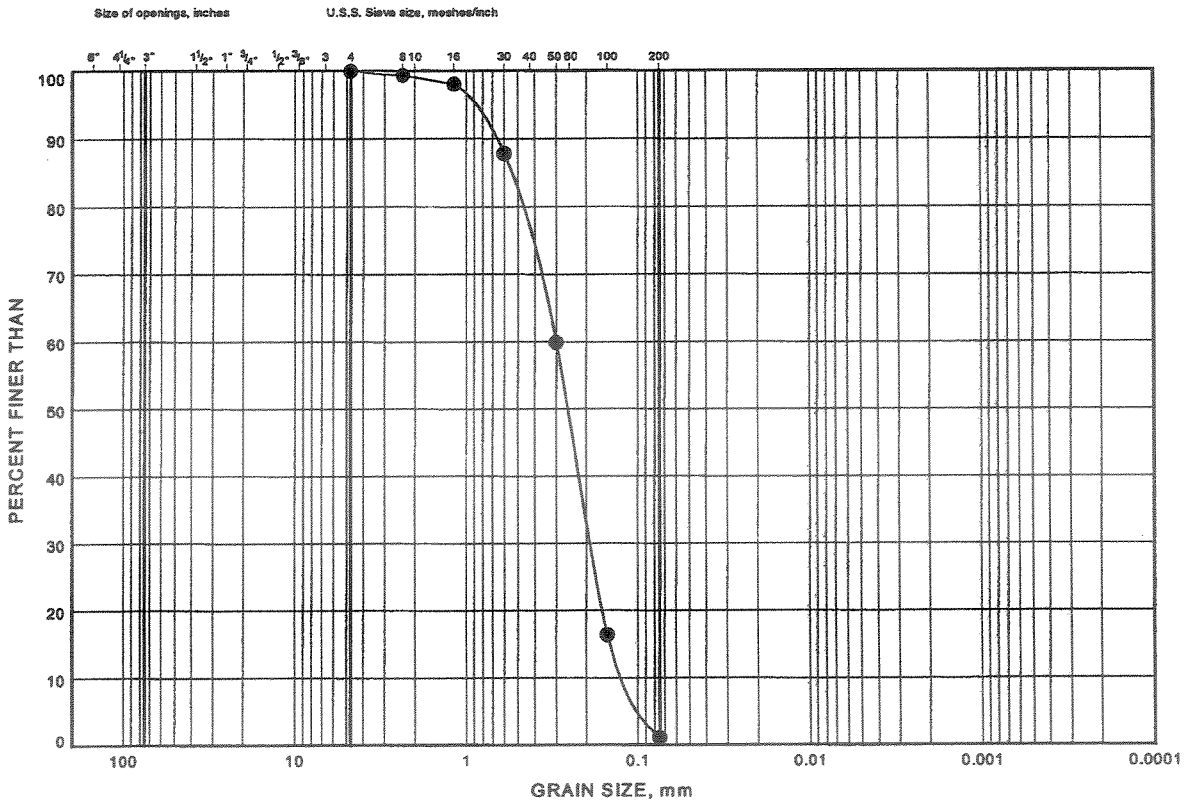
GRAIN SIZE DISTRIBUTION

FIGURE 5

SAND, trace silt



COBBLE SIZE	GRAVEL		SAND			SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EBW14-6	4.57~5.18	

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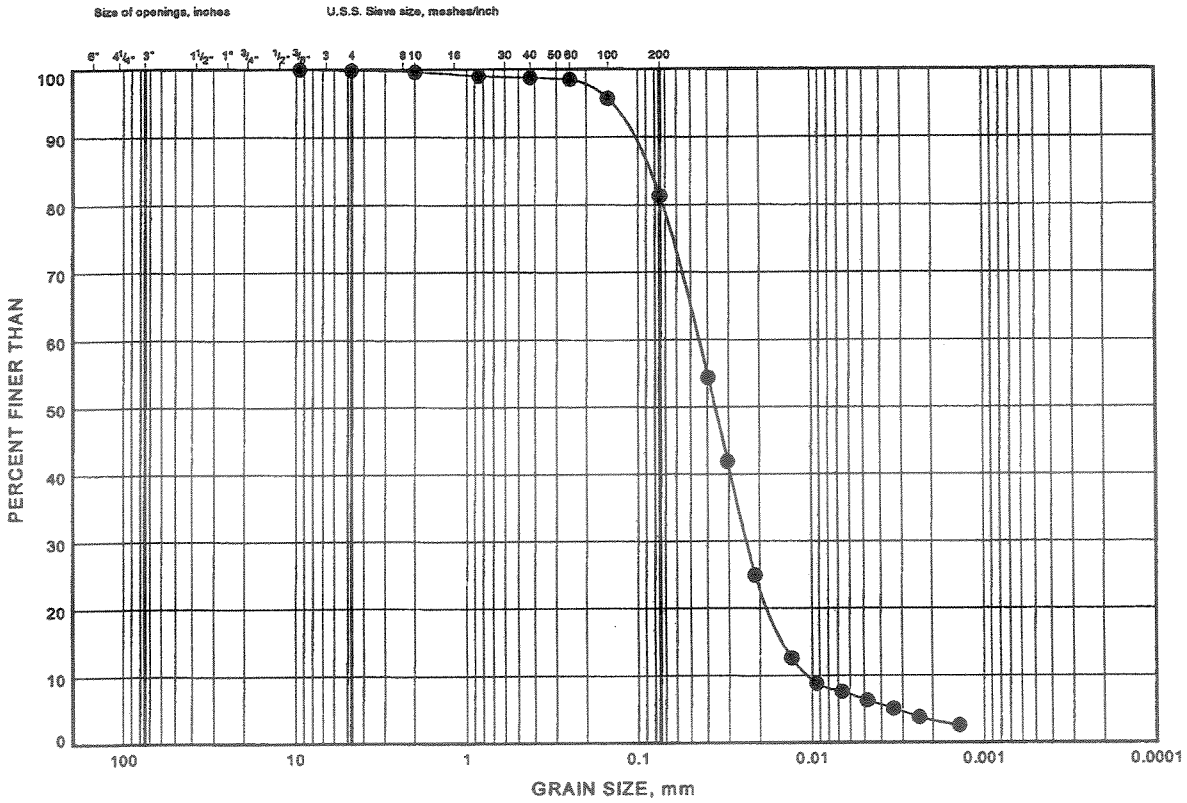
GRAIN SIZE DISTRIBUTION

FIGURE 6

SILT, some sand, trace clay



COBBLE SIZE	GRAVEL		SAND			SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EMW12-2	0.76~1.37	

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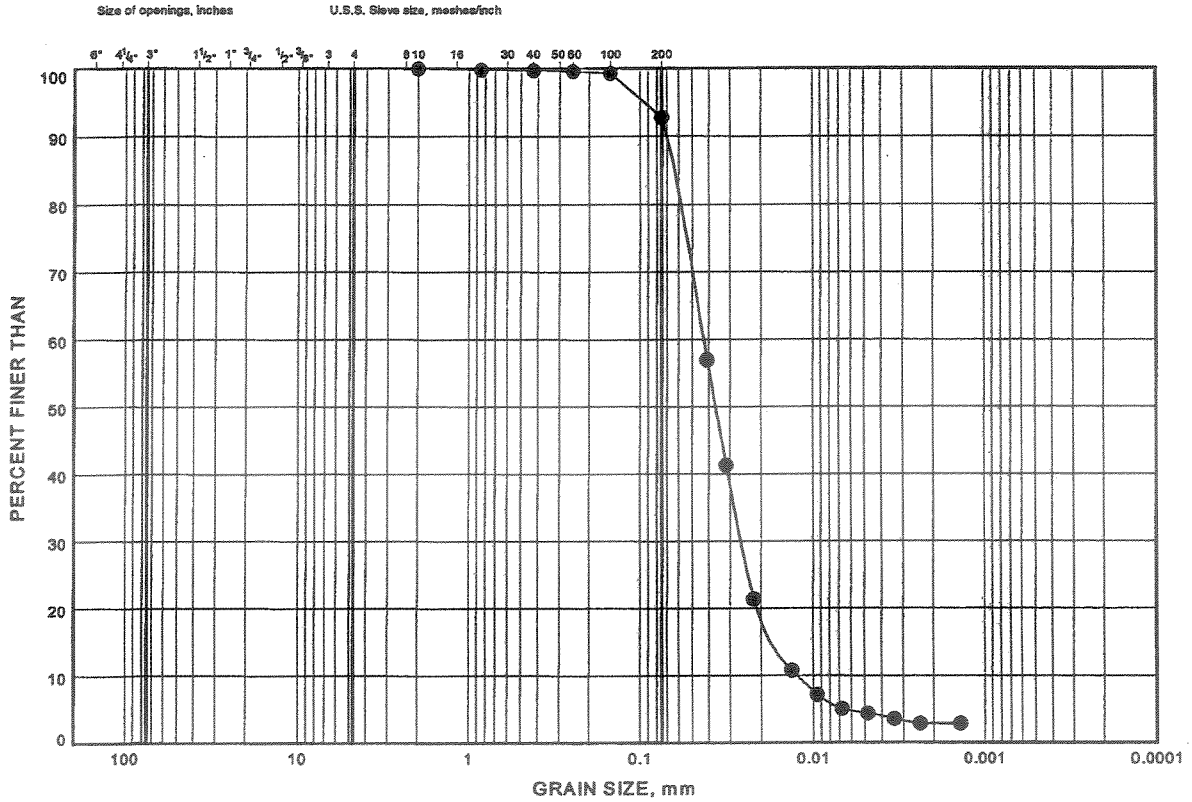
GRAIN SIZE DISTRIBUTION

FIGURE 7

SILT, trace sand, trace clay



COBBLE SIZE	GRAVEL		SAND			SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EMW12-3	1.52~2.13	

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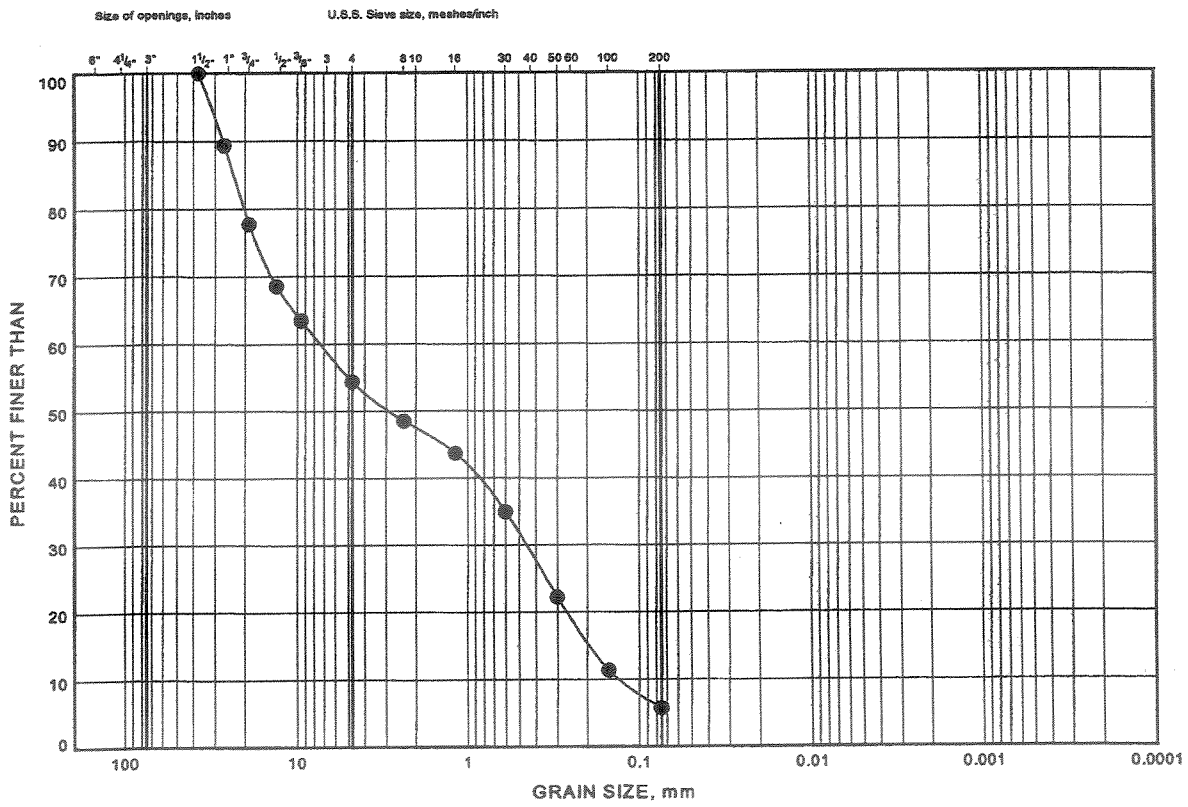
GRAIN SIZE DISTRIBUTION

FIGURE 8

SAND and GRAVEL, trace silt



COBBLE SIZE	GRAVEL		SAND			SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EMW13-5	3.05~3.66	

Date March 2006

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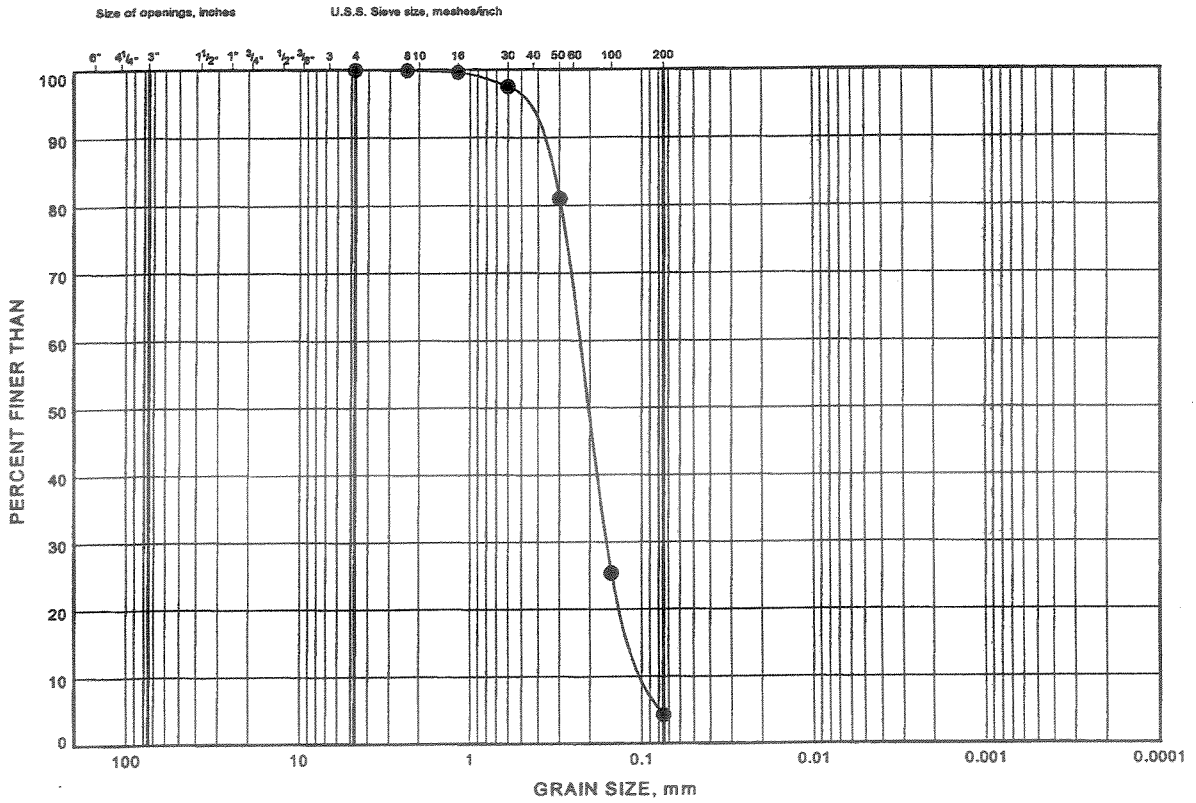
GRAIN SIZE DISTRIBUTION

FIGURE 9

SAND, trace silt



COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
	GRAVEL		SAND			FINE GRAINED

SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	EMW14-3	1.52~2.13	

Date March 2006

Project 19-4378-1

THURBER

Prep'd EA

Chkd. WM

THURBGSD 3781.GPJ 30/03/06

APPENDIX F

TABLE 10 – SITE MITIGATION DESIGN ALTERNATIVES PROPOSED GRAVENHURST PATROL YARD

Table 10
Site Mitigation Design Alternatives - Proposed Gravenhurst Patrol Yard

Design Alternative	Mitigation Measures in Operations Area		Advantages	Disadvantages	Risks	Approximate Relative Installation Costs
	Stormwater	Washwater				
1. Traditional Patrol Yard - operations area asphalted, outdoor storage area gravel, earth or sod - no outside catch-basins - catch-basins inside wash or service bays	- no on-site containment or treatment – direct discharge to ditches through overland flow	- into oil/water separator with effluent discharge into ditches	- relatively cheap to construct - minimal design requirements and engineering measures	- no containment and minimal treatment of stormwater and washwater - will likely significantly impact groundwater - Certificate of Approval (C of A) required for oil/water separator - MOE Generator Registration Number required to dispose of separator sludge	- significant environmental risk to wetland	Base line cost (for a typical patrol yard)
2. Traditional Patrol Yard - operations area asphalted - catch-basins outside and inside wash or service bays - stormwater and washwater conveyed to lined retention pond	- into lined retention pond with outfall into wetland (no primary treatment)	- into lined retention pond with outfall into wetland (no primary treatment)	- significant containment of stormwater and washwater - achieves an appreciable level of treatment prior to release into the environment	- expensive to construct and maintain - C of A required for the retention pond - MOE Generator Registration Number required to dispose of detention pond sludge - could require significant land area to construct - requires a relatively high level of design and engineering - potential for wetland impacts from outlet water - liner could fail resulting in environmental impacts	- potential environmental risk to wetland - liner could fail resulting in significant environmental impacts	Base line cost + - lined retention pond ($200,000) - catch basins and laterals under asphalt ($100,000 per hectare)
	- through oil/water separator and into lined retention pond with outfall into wetland	- through oil/water separator and into lined retention pond with outfall into wetland	- significant containment of stormwater and washwater - achieves a relatively high level of treatment prior to release into the environment	- expensive to construct and maintain detention pond - C of A required for the retention pond and oil/water separator - MOE Generator Registration Number required to dispose of detention pond and separator sludge - could require significant land area to construct retention pond - requires a relatively high level of design and engineering for both the oil/water separator and retention pond - potential for wetland impacts from outlet water - liner could fail resulting in environmental impacts - oil/water separator could leak resulting in environmental impacts	- potential environmental risk to wetland - liner could fail resulting in significant environmental impacts - oil/water separator could leak resulting in environmental impacts	Base line cost + - lined retention pond ($200,000) - catch basins and laterals under asphalt ($100,000 per hectare) - 2 oil/water separators ($15,000 each)
	- through a filter system and into lined retention pond with outfall into wetland	- through a filter and into lined retention pond with outfall into wetland	- significant containment of stormwater and washwater - achieves a high level of treatment prior to release into the environment	- treatment technology for filter system is relatively new and could be subject to long-term limitations - filter system requires a high level of maintenance - expensive to construct and maintain detention pond - C of A required for the retention pond and filter system (?) - MOE Generator Registration Number required to dispose of detention pond and filters and accumulated sludge - could require significant land area to construct retention pond - requires a relatively high level of design and engineering for retention pond - potential for wetland impacts from outlet water - pond liner could fail resulting in environmental impacts	- potential environmental risk to wetland - liner could fail resulting in significant environmental impacts	Base line cost + - lined retention pond ($200,000) - catch basins and laterals under asphalt ($100,000 per hectare) - filter system ($25,000)
3. Lined Patrol Yard - operations area asphalted - catch-basins outside and inside wash or service bays	- into lined retention pond with outfall into wetland (no primary treatment)	- into lined retention pond with outfall into wetland (no primary treatment)	- complete containment of any spills in operation area - significant containment of stormwater and washwater in detention pond	- very expensive to construct site liner - expensive to construct and maintain detention pond - C of A required for the retention pond - MOE Generator Registration Number required to	- potential environmental risk to wetland - pond liner could fail resulting in significant	Base line cost + - lined retention pond ($200,000) - lined site similar to a landfill ($500,000)

Table 10
Site Mitigation Design Alternatives - Proposed Gravenhurst Patrol Yard

Design Alternative	Mitigation Measures in Operations Area		Advantages	Disadvantages	Risks	Approximate Relative Installation Costs
	Stormwater	Washwater				
- operations area underlined with a impermeable geo-membrane to completely contain stormwater and washwater, and convey to lined retention pond			- achieves an appreciable level of treatment prior to release into the environment	dispose of detention pond sludge - could require significant land area to construct - requires a relatively high level of design and engineering - potential for wetland impacts from outlet water - pond liner could fail resulting in environmental impacts	environmental impacts	- catch basins and laterals under asphalt ($100,000 per hectare)
	- through oil/water separator and into lined retention pond with outfall into wetland	- through oil/water separator and into lined retention pond with outfall into wetland	- complete containment of any spills in operation area - significant containment of stormwater and washwater in detention pond - achieves a relatively high level of treatment prior to release into the environment	- very expensive to construct site liner expensive to construct and maintain detention pond - C of A required for the retention pond and oil/water separator - MOE Generator Registration Number required to dispose of detention pond and separator sludge - could require significant land area to construct retention pond - requires a relatively high level of design and engineering for both the oil/water separator and retention pond - potential for wetland impacts from outlet water - pond liner could fail resulting in environmental impacts - oil/water separator could leak resulting in environmental impacts	- potential environmental risk to wetland - pond liner could fail resulting in significant environmental impacts - oil/water separator could leak resulting in environmental impacts	Base line cost + - lined retention pond ($200,000) - lined site similar to a landfill ($500,000) - catch basins and laterals under asphalt ($100,000 per hectare) - 2 oil/water separators ($15,000 each)
	- through a filter system and into lined retention pond with outfall into wetland	- through a filter and into lined retention pond with outfall into wetland	- complete containment of any spills in operation area - significant containment of stormwater and washwater in detention pond - achieves a high level of treatment prior to release into the environment	- very expensive to construct site liner - treatment technology for filter system is relatively new and could be subject to long-term limitations - filter system likely requires a high level of maintenance - expensive to construct and maintain detention pond - C of A required for the retention pond and filter system (?) - MOE Generator Registration Number required to dispose of detention pond and filters and accumulated sludge - could require significant land area to construct retention pond - requires a relatively high level of design and engineering for retention pond - potential for wetland impacts from outlet water - pond liner could fail resulting in environmental impacts	- potential environmental risk to wetland - pond liner could fail resulting in significant environmental impacts	Base line cost + - lined retention pond ($200,000) - lined site similar to a landfill ($500,000) - catch basins and laterals under asphalt ($100,000 per hectare) - filter system ($25,000)
4. Lined Patrol Yard with Large Salt Storage Facility and Wash Bay - operations area asphalted - no outside catch-basins – overland flow to perimeter drainage ditches - large salt storage facility of sufficient size to accommodate indoor salt handling and salt storage	- overland flow to perimeter drainage ditches upgradient of wetland or into the new highway interchange drainage system	- through oil/water separator and into collection tank(s)	- since stormwater will contain relatively low levels of road salt and all salt handling and storage is contained inside the large lined storage facility, there is no need to treat the stormwater prior to release into the environment via an exfiltration trench or into the new highway interchange drainage system. - since all washwater is collected in tanks with no discharge into detention ponds, there is no potential environmental risk to the wetland.	- C of A required for oil/water separator - MOE Generator Registration Number required to dispose of wastewater and separator sludge - high maintenance costs – frequent pump-outs by a MOE licensed liquid waste hauler - potential for wetland impacts from perimeter drainage ditches - oil/water separator could leak resulting in environmental impacts - any significant salt releases (spills) outside in the	- potential environmental risk to wetland - oil/water separator could leak resulting in environmental impacts - any significant salt releases (spills) outside in the operations area could impact the environment	Baseline cost + - additional building volume and area for vehicle unloading, loading and maneuvering (25%-50% additional cost for structures) - lined building footprint ($150,000) - oil/water separator ($15,000) - holding tanks (depending on

Table 10
Site Mitigation Design Alternatives - Proposed Gravenhurst Patrol Yard

Design Alternative	Mitigation Measures in Operations Area		Advantages	Disadvantages	Risks	Approximate Relative Installation Costs
	Stormwater	Washwater				
adjoining enclosed wash bay - geo-membrane lining beneath building footprint to contain and collect washwater into inside catch-basins and collection tank(s)			- relatively cheap to construct oil/water separator, lined drainage ditch and exfiltration trench - does not require a high level of design and engineering for the oil/water separator, lined drainage ditch and exfiltration trench	operations area could impact the environment		size - between $15,000 and $25,000)
	- overland flow to perimeter drainage ditches upgradient of wetland or into the new highway interchange drainage system	- through a filter system with effluent discharge into holding tank(s) to either be disposed of off-site or re-used as salt brine	- since stormwater will contain relatively low levels of road salt and all salt handling and storage is contained inside the large lined storage facility, there is no need to treat the stormwater prior to release into the environment via an exfiltration trench or into the new highway interchange drainage system. - since all washwater is collected in tanks with no discharge into detention ponds, there is no potential environmental risk to the wetland. - recycling the washwater reduces winter road maintenance costs	- treatment technology for filter system is relatively new and could be subject to long-term limitations - filter system requires a high level of maintenance - C of A required for filter system (?) - MOE Generator Registration Number required to dispose of wastewater and separator sludge - if not recycling washwater, high maintenance costs – frequent pump-outs by a MOE licensed liquid waste hauler - potential for wetland impacts from perimeter drainage ditches - any significant salt releases (spills) outside in the operations area could impact the environment	- potential environmental risk to wetland - any significant salt releases (spills) outside in the operations area could impact the environment	Baseline cost + - additional building volume and area for vehicle unloading, loading and maneuvering (25%-50% additional cost for structures) - lined building footprint ($150,000) - holding tanks (depending on size - between $15,000 and $25,000) - filter system ($25,000)

APPENDIX G

GOLDER'S PEER REVIEW COVER LETTER

Golder Associates Ltd.

2390 Argentia Road
Mississauga, Ontario, Canada L5N 5Z7
Telephone 905-567-4444
Fax 905-567-6561

March 29, 2007

05-1111-029

McCormick Rankin Corporation
300-1145 Hunt Club Road
Ottawa, Ontario
K1V 0Y3

Attention: Mr. Manny Goetz, P.Eng.

RE: INTERIM INTERNAL AUDIT
HYDROGEOLOGICAL INVESTIGATION AND DESIGN – FINAL REPORT
HIGHWAY 11, GRAVENHURST PATROL YARD
DISTRICT 52, HUNTSVILLE
G.W.P. 5420-02-00

Dear Mr. Goetz:

Based on an e-mail sent to us from Ecoplans Limited on March 21, 2007, we understand that MTO Foundations have reviewed the revised draft hydrogeological investigation and design report for the Highway 11 Gravenhurst Patrol Yard (dated January 2007) and have no comments. The final hydrogeological report (dated March 2007) was sent to us by Ecoplans in an e-mail on March 22, 2007. We have reviewed the final report and have no further comments. Please do not hesitate to contact our office if you have any questions or require further information.

GOLDER ASSOCIATES LTD.

Kevin J. Bentley, P.Eng.
Project Manager

Robert D. Blair
RAQS Registered Hydrogeological Specialist

Fintan J. Heffernan, P.Eng.
MTO Designated Contact

KJB/RDB/FJH/wlm

N:\ACTIVE\2005\1111\05-1111-029 mrc patrol yard gravenhurst\8 - hydrogeology\correspondence\final report\05-1111-029 qcletterfinalhydrogeology 07march29.doc