APPENDIX 6.2.8-D

Ecotoxicity Study at the Star Diamond Project, Saskatchewan

CanNorth
Canada North Environmental Services
Limited Partnership

ECOTOXICITY STUDY AT THE STAR DIAMOND PROJECT, SASKATCHEWAN

Final Report

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1.0 INTRODUCTION

1.1 Background

Canada North Environmental Services (CanNorth) was retained by Shore Gold Resources Inc. (Shore Gold) to collect and analyze the toxicity of effluent from their Star Diamond underground exploration mine. The primary parameter of concern in the effluent is elevated total dissolved solids (TDS) concentrations. Thus, a further objective of this study was to assess the impact of a range of hypothetical TDS concentrations at set discharge rates in the receiving environment in the Saskatchewan River.

The Shore Gold Star Diamond Project is located approximately two kilometres north of the Saskatchewan River (Figure 1). At this time, mine effluent is contained in unlined ponds and is not discharged. However, the effluent infiltrates into the groundwater which flows south towards the river and a small ravine called West Ravine. The study involved testing samples collected from the end-of-pipe discharge and West Ravine (Figure 2).

1.2 Study Objectives

The objectives of this assessment were to:

- collect water samples from the end-of-pipe discharge (station MWS-01) and West Ravine (station WRS-03) as required for a suite of toxicity tests and chemical analyses;
- conduct two lethal and four sublethal toxicity assays on the samples from stations MWS-01 and WRS-03;
- conduct chemical analyses measuring levels of TDS, major ions, nutrients, total metals, and dissolved metals on the samples from stations MWS-01 and WRS-03;
- assess the impact of a hypothetical discharge of 4.2 m^3/s (250,000 L/min) of existing end-of-pipe water quality to the receiving environment (i.e., the Saskatchewan River) given known river flow;
- estimate the impact of a range of hypothetical effluent TDS concentrations from 500 to 10,000 mg/L on the water quality of the Saskatchewan River to identify upper thresholds of TDS that may not harm the aquatic environment; and,
- provide information on the potential effects that the range of TDS concentrations may have on test fish species and fish species indigenous to the Saskatchewan River.

1.3 Study Area

The Star Diamond Project is located approximately 60 km east of Prince Albert, Saskatchewan (Figure 1). The project is situated in a burnt portion of the Fort à la Corne forest, two kilometres north of the Saskatchewan River.

1.3.1 Ecosystem Description

The Star Diamond Project area occurs in the La Corne Plain Landscape Area within the Boreal Transition Ecoregion of the Boreal Plain Ecozone (Acton et al. 1998, SKCDC 2002). This ecoregion represents a transition between the grasslands to the south and the boreal forest to the north. The La Corne Plain is an undulating fluvial-glaciolacustrine plain that occurs along the Saskatchewan River (Simpson 1997). The project is surrounded by the Fort à la Corne sand hills that cover an area of approximately 1200 km^2 (Wolfe et al. 2006). The underlying bedrock consists of silt and clay shales of the late Cretaceous age. Dominant soil types in the project area are sandy-loam Gray Luvisols; however, Brunisolic soils associated with the sand hills are also prevalent in the region (Fung 1999).

The climate in the study area has been classified as humid continental by the Köppen classification, and dry sub-humid using the Thornthwaite (1948) moisture index (Fung 1999). The climate in this region is typical of the subarctic climate in northern areas and at higher elevations (Acton et al. 1998). Summary climate data for the ecoregion are provided in the following table.

Boreal Transition Ecoregion Climate	
Mean annual precipitation	452 mm
Mean annual snowfall	143 cm
Mean July Temperature	17.4°C
Mean January Temperature	-20.0°C
Mean annual daily temperature	0.4°C
Frost free period	94 days

Source: Acton et al. (1998), SKCDC (2002).

Jack pine (*Pinus banksiana*) and trembling aspen (*Populus tremuloides*) are the two dominant tree species in the project area, and many upland areas are regenerating from a 20-year old burn through the region (CanNorth 2007). Common shrub species in the

project area include saskatoon berry (*Amelanchier alnifolia*), prickly rose (*Rosa acicularis*), common blueberry (*Vaccinium myrtilloides*), green alder (*Alnus crispa*), and bearberry (*Arctostaphylos uva-ursi*) (CanNorth 2007). Elk sign was noted in the West Ravine at the time of the water sampling. More extensive vegetation information for the project area is provided in the draft report "Vegetation and rare plant survey of the Shore Gold Project study area near Prince Albert, Saskatchewan" (CanNorth 2007).

1.3.2 General Hydrology

The dominant hydrological feature in the study area is the Saskatchewan River, which is located approximately two kilometres south of the project. Two ravines on either side of the project lead to the river (Figure 2). The drainage area of West Ravine is estimated to be 1.95 km^2.

The Saskatchewan River Forks is located approximately 45 km upstream (20 km over land) of the Star Diamond Project. The Gardiner and Qu'Appelle dams on the South Saskatchewan River and the Bighorn Dam on the North Saskatchewan River in Alberta regulate streamflow in the Saskatchewan River. The flow regime in the South Saskatchewan River has changed considerably since the completion of the Gardiner Dam in 1968 (Conor Pacific and Clifton 1999). Prior to 1968, peak flows from snowmelt in the foothills and prairie regions occurred in April and May, usually followed by a larger peak flow from mountain snowmelt in June (Richards 1980). From 1968 onward, peak flows tend to occur in the winter months when Lake Diefenbaker is being drawn down to meet power demands, while spring and summer runoff is stored in the reservoir for later use in power generation and irrigation (Conor Pacific and Clifton 1999).

2.0 METHODS

2.1 Sampling and Shipping

Two stations were sampled in the Star Diamond Project area on January 3, 2007; the end-of-pipe discharge station MWS-01 and the West Ravine station WRS-03. Locations of the sampling stations relative to the project area and the Saskatchewan River are presented in Figure 2.

The Stantec Consulting Ltd. laboratory provided detailed sampling and shipping protocols for water samples taken for toxicity assays, as well as supplying sampling containers, coolers, gel packs, and chain of custody forms. All sampling containers (liners, bottles, and polyethylene jugs) and equipment were rinsed thoroughly with site water prior to sampling. Trapped air was expelled from the sampling containers, and no headspace was left in the sample bottles. Containers were sealed tightly. Shipping labels were attached to all containers, and a waterproof copy of the chain of custody form was included in the shipment. Samples remained in the custody of CanNorth personnel until they were shipped.

It is required that water samples be maintained at temperatures above freezing, and the ideal temperature for shipping and storage is 4°C. Initial water temperatures were 1°C at the receiving water station WRS-03, and 9 to 10°C at the end-of-pipe discharge station MWS-01. Effort was made to cool the acute toxicity sample waters at the MWS-01 station by storing the containers temporarily in the snow and shade during sampling. Thereafter, these samples were packed in coolers with gel packs and loose ice in order to keep them cool (between 1°C and 7°C) during storage. A total of 78 L of water was collected from each sampling site.

The water samples were shipped on January 3, 2007 via Purolator Courier to the Stantec Consulting Ltd. toxicity laboratory in Guelph. Overnight delivery ensured that time limitations were met for the toxicity tests; a maximum of three days is allowed between sampling and analysis for sublethal tests. The water samples arrived to the laboratory on January 4, 2007, and water temperatures measured upon arrival were within the required limits.

2.2 Water Quality

Chemical analyses on the water samples from stations MWS-01 and WRS-03 collected January 3, 2007 included TDS, major ions, nutrients, dissolved metals, and total metals. In addition, Shore Gold provided water chemistry data collected in July 2006 from the Saskatchewan River, upstream and downstream of the West Ravine at stations NSRS-01 and NSRS-02. ALS Laboratories in London, Ontario provided water chemistry testing services for this project.

2.2.1 QA/QC

Quality control reports for the analyses are provided with the water quality laboratory results in Appendix A. CanNorth personnel reviewed the results against water quality objectives (CCME 2005, SE 2006) and compared them to previous water quality monitoring results provided by Shore Gold. Through an examination of major ion balance, anomalous values for sodium from Station MWS-01 were identified. As a result, the sample was re-digested and re-analyzed; the revised report is provided in Appendix A.

2.3 Toxicity Tests

The toxicity tests chosen for this effluent study are standard tests required by the Canadian Metal Mining Effluent Regulations (MMER) (EC 2002). It is noted that the Star Diamond Project is not directly regulated by the MMER. However, these six acute and sublethal tests chosen are based on standard methods from Environment Canada (EC 1990a, 1990b, 1992a, 1992b, 1992c, and 1999), and these test methods are the accepted industry standard in Canada for toxicity testing. The following table provides information on the acute and sublethal tests and protocols included in this study.

Acute tests:	**Test Method**	**Length**
LC50 using rainbow trout (*Oncorhynchus mykiss*)	EPS 1/RM/13	96-hour
LC50 using the water flea (*Daphnia magna)*	EPS 1/RM/14	48-hour
Sublethal tests:		
Survival and reproduction of the water flea (*Ceriodaphnia dubia)*	EPS 1/RM/21	7-day
Survival and growth of fathead minnow (*Pimephales promelas*)	EPS 1/RM/22	7-day
Growth inhibition of green algae (*Selenastrum capricornutum)*	EPS 1/RM/25	72-hour
Growth inhibition lesser duckweed (*Lemna minor)*	EPS 1/RM/37	7-day

Toxicity analyses were completed in January 2007 on large-bodied fish, small-bodied fish, plant, and algae species at the Stantec Consulting Ltd. laboratory in Guelph, Ontario. A 96-hour acute lethality test was performed on rainbow trout, and a 48-hour acute lethality test was performed on the crustacean, *D. magna*. The endpoint for the test is an LC50, which is the concentration of sample that is calculated to be lethal to 50% of the test organism over the exposure period. Sublethal tests were completed for *C. dubia*, fathead minnow, *S. capricornutum*, and lesser duckweed. Sublethal test methods calculate the IC25 for each test species in each sample. The IC25 is the "inhibition" concentration of the test substance in water that is estimated to cause 25% reduction in growth or reproduction.

A dilution factor of 0.5 was used for the acute tests, while a dilution factor of 0.3 was used for the sublethal tests. Acute test concentrations were 0% (control), 6.25%, 12.5%, 25%, 50%, and 100%. There were four *D. magna* replicates and ten rainbow trout test organisms. Sublethal test substance concentrations were 0%, 0.81%, 2.7%, 9%, 30%, and 100% in order to be representative of the actual dilution effect of the Saskatchewan River at low to median streamflow on a hypothetical effluent discharge. There were ten test replicates for each concentration for *C. dubia*, and three test replicates for each concentration of fathead minnow, lesser duckweed, and *S. capricornutum*.

Standard laboratory water was used for the dilutions in the toxicity testing[1]. Some of the merits of using laboratory water include: 1) that it provides a measure of the inherent toxicity of the effluents and allows comparison of effluent quality over time, 2) no additional acclimation or screening procedures are necessary, 3) it can be maintained at a consistent quality with less risk of contamination by harmful chemicals or biota, and 4) the volume of sample required for shipping is greatly reduced. The hardness, conductivity, and pH of the laboratory water were similar to background values measured in the Saskatchewan River at the Shore Gold site in July 2006.

[1] Standard laboratory water is used for culturing and testing requirements (including dilutions) at most laboratories in Canada (EC 2002).

2.3.1 QA/QC

Stantec Consulting Ltd. laboratory is certified with the Canadian Association for Environmental Analytical Laboratories (CAEAL) and regularly performs acute and sublethal testing. Quality control for the toxicity tests is required by the MMER regulations, and is provided in detail in the standard test methods (EC 1990a, 1990b, 1992a, 1992b, 1992c, and 1999). All test validity criteria as specified in the test methods were satisfied.

Reference toxicant tests were conducted concurrent with all the test methods to ensure that the test organism sensitivity was within acceptable quality control warning chart limits. A sodium-chloride reference test was conducted for the *D. magna*, *C. dubia*, and *S. capricornutum*, and a potassium-chloride reference test was conducted for rainbow trout, lesser duckweed, and fathead minnow.

2.4 Low Flow Calculation

A characteristic low streamflow value was calculated for the Saskatchewan River in the vicinity of the project area. This was completed to estimate the dilution effect from the river on a hypothetical steady effluent discharge containing a range of TDS concentrations from 500 mg/L to 10,000 mg/L. The 7Q10 is a standard low streamflow criterion above which all pollutant loads should conform to water quality objectives (SE 2006). Streamflow lower than this discharge value would occur infrequently, and under such conditions it would not be expected that all water quality objectives would be met for a given watercourse. The 7Q10 is the streamflow equal to or less than the mean seven-day low flow that would occur (on average) once in ten years (Q = discharge, m^3/s). It is not practical for use on small streams where streamflow may be intermittent (Elshorbagy et al. 2005), but would be applicable for the Saskatchewan River.

In order to provide low streamflow records for the Saskatchewan River, a daily long-term streamflow dataset was compiled from the combined flows of the North and South Saskatchewan Rivers. The Water Survey of Canada (WSC 2006) stations at Saskatoon (05HG001) and Prince Albert (05GG001) were combined. The 7Q10 streamflow was calculated over the period 1975 to 2005 utilizing AQUAPAK™ programming (Gordon et al. 2004).

In the compiled dataset, it was approximated that the streamflow was delayed one day from Prince Albert to the project, and two days from Saskatoon to the project. No adjustment of the dataset was made to account for the increased effective drainage area of the two Saskatchewan rivers, as the increase is only 1.2% between the Saskatoon and St. Louis (05HH001) stations, and may be considered insignificant. In addition, the water balance of the two rivers between Saskatoon, Prince Albert, and the project is not known (e.g., there may be a net loss of streamflow volumes due to domestic water source withdrawal, or gains and/or losses due to natural processes).

3.0 RESULTS

3.1 Water Quality

Water quality results for the end-of-pipe discharge (station MWS-01) and receiving environment (station WRS-03), collected in January 2007 in support of the toxicity analyses, are provided in Tables 1 and 2 and Appendix A. Water chemistry results from the Saskatchewan River upstream and downstream of the West Ravine in July 2006 (stations NSRS-01 and NSRS-02) provide valuable data for the receiving environment and therefore this information has been included in Table 1.

3.1.1 Major Ions

In comparison to the Saskatchewan River, TDS values at the end-of-pipe discharge and receiving environment stations are elevated. In the January 2007 samples, TDS was 4,360 mg/L at station MWS-01 and 1,870 mg/L at station WRS-03. TDS concentrations on the Saskatchewan River at stations NSRS-01 and NSRS-02 were 253 mg/L and 247 mg/L in July 2006, respectively.

Major ion balances were calculated and examined for each water sample as a quality-assurance check of the chemical analyses, and also to determine the dominant major ions. The ion balance was calculated (in meq/L) as the total dissolved-cation concentration minus the total dissolved-anion concentration divided by the total concentration of ions dissolved in solution. Stations MWS-01 and WRS-03 were dominated by sodium-chloride type water, while NSRS-01 and NSRS-02 were dominated by calcium bicarbonate type water (Table 3). Reynoldson (1983) also noted that the major dissolved salt on the North Saskatchewan River was calcium bicarbonate. Calcium and magnesium concentrations were higher at the WRS-03 station compared to MWS-01, which may be inferred from the higher hardness measured at this station.

There are no Saskatchewan Environment (SE 2006) objectives or CCME (2005) guidelines for major ions and TDS for the protection of aquatic life. The aesthetic objective for TDS of 500 mg/L recommended by Health Canada (1991) is also the maximum water quality objective for certain agricultural purposes, including the irrigation of certain crops (SE 2006). This level was exceeded at stations MWS-01 and WRS-03 in the January 2007 samples.

Chloride concentrations measured at MWS-01 and WRS-03 were 2,120 mg/L and 810 mg/L, respectively, while the chloride measured at NSRS-02 downstream of the West Ravine in July 2006 was only 6 mg/L. Although no guidelines or water quality objectives exist for chloride for the Saskatchewan River in the study area, the Prairie Provinces Water Board objective for this river near the Manitoba border is 68 mg/L chloride.

3.1.2 Total and Dissolved Metals

Total metal concentrations allow for the comparison of station water quality information to guidelines. However, dissolved metals represent the portion of total metal concentrations that are more biologically available. In general, total metal concentrations were highest at station MWS-01, followed by WRS-01, and were lowest at the Saskatchewan River stations NSRS-01 and NSRS-02 (Tables 1 and 2). Notable exceptions were that total concentrations of barium, iron, and manganese were higher at WRS-01 than at MWS-01. Dissolved metals were generally lower at the WRS-01 station as well.

Water sampling results from the stations MWS-01 and WRS-03 (collected in January 2007) and NSRS-01 and NSRS-02 (collected in July 2006) were compared with water quality objectives (SE 2006) for the protection of aquatic life (Table 1). Several parameters slightly exceeded water quality objectives from the MWS-01 station, including aluminium, ammonia-N, cadmium, chromium, and selenium. In the WRS-03 water sample, cadmium, iron and selenium values met or exceeded the objectives. It is noted that the dissolved selenium value was 150% greater than the total selenium value, which is anomalous. Aluminium in samples collected from stations NSRS-01 and NSRS-02 in July 2006 exceeded SE (2006) guidelines in the Saskatchewan River; total iron was equivalent to the water quality objective at NSRS-02.

Based on water quality data provided by Shore Gold from July 2006, there were no measured changes in TDS, major ions, and metal concentrations from upstream of the project on the Saskatchewan River versus downstream of the project. The impact of this project on the water quality of the river was negligible at that time.

3.2 Toxicity Tests

3.2.1 Acute

The end-of-pipe discharge (MWS-01) and the West Ravine station (WRS-03) samples tested were found to be non-acutely toxic to rainbow trout and *D. magna*. Acute toxicity test results are provided in Appendix B. The LC50 refers to the concentration of effluent in water that is estimated to cause death of 50% of the test organisms within a fixed period of time. There was no mortality in both the WRS-03 sample and the MWS-01 sample at 100% effluent concentrations. This is in compliance with Canadian MMER (Canada 2002), as well as Saskatchewan Environment (SE 2006) monitoring requirements for acute toxicity.

3.2.2 Sublethal

The water sample from the West Ravine (WRS-03) did not cause significant sublethal toxic effects (Appendix C). There were no significant adverse effects in terms of fathead minnow growth (IC25 > 100%), *C. dubia* reproduction (IC25 > 100%), lesser duckweed growth (IC25's for weight and frond production > 100%), or *S. capricornutum* growth (IC25 > 100%). In addition, there was no significant mortality of larval fathead minnows (≤ 6.7% mortality) or *C. dubia* (≤ 10% mortality) at any concentration tested. No aberrant behaviour or swimming impairment was observed in the test organisms.

The end-of-pipe discharge test sample (MWS-01) did not adversely affect fathead minnow survival (LC50 > 100%) or growth (IC25 > 100%). Similarly, the sample tested had no adverse effect on *S. capricornutum* growth (IC25 > 100%) (Appendix C).

Lesser duckweed growth results in the MWS-01 sample were mixed. Based on weight, there was no significant adverse effect (IC25 > 97%), which is the highest concentration that can be tested due to addition of growth media to the sample. However, based on frond production, there was a noticeable effect (IC25 = 53.7%). Generally, weight is the more reliable estimate of growth impacts, so this would suggest relatively little to no effect (Stantec, Pers. Comm.).

The MWS-01 sample tested clearly exhibited lethal and sublethal toxicity to *C. dubia* in the test results. There was evidence of reduced survival with an LC50 of 16.4%, and reduced reproduction with an IC25 of 4.1%. This means that at a MWS-01 test sample concentration of 4.1%, there was a 25% reduction in *C. dubia* reproduction.

In order to monitor water quality during the toxicity testing, hardness, pH, dissolved oxygen, specific conductance, and water temperature were measured prior to and/or during the various toxicity analyses, depending on the relevance of these results to the analyses (Table 4). It is required by the toxicity test methods that these parameters remain static for the duration of the assays. The similarity of the hardness and pH results to background levels measured in the Saskatchewan River supports the use of laboratory water for dilution water in this study.

3.3 Hypothetical TDS concentrations

The seven-day low flow (7Q10) for the Saskatchewan River was calculated to be 163 m^3/s from the combined daily records of the North and South Saskatchewan rivers. Results are provided in Table 5. The hypothetical effluent discharge of 4.2 m^3/s assumed for the purposes of this study makes up 2.5% of the 7Q10 streamflow criteria for the Saskatchewan River on a volume basis, and approximately 1% of the estimated mean annual daily flow of 417 m^3/s. Assumptions included that there was no additional surface runoff into the Saskatchewan River from the West Ravine, apart from the effluent discharge of 4.2 m^3/s. In addition, it was assumed that there was no change in water quality from the end-of-pipe discharge (i.e., station MWS-01) to the Saskatchewan River.

The hypothetical loading rates of TDS into the Saskatchewan River (and its concentrations) were calculated making the assumption of the direct input of effluent containing concentrations of TDS ranging from 500 mg/L to 10,000 mg/L at a rate of 4.2 m^3/s (363,000 m^3/day). Based on these calculations, TDS concentrations ranging from marginally over background levels of 250 mg/L up to 495 mg/L were estimated for the Saskatchewan River downstream of the project (Table 6). The loading rate was calculated by multiplying the concentration and the discharge. Utilizing the measured TDS level from station MWS-01 and the 7Q10 low streamflow, the loading rate would be 5.8×10^4 g/m^3/day TDS. Daily loading rates based on the range of hypothetical TDS concentrations, including the actual TDS concentration in the end-of-pipe discharge are also included in Table 6.

3.4 Potential Impacts to Fish

There may be potential impacts to the indigenous fish population of the Saskatchewan River from elevated TDS levels. A total of 32 fish species have been recorded in the

Saskatchewan River in this province (Table 7). However, the worst-case scenario TDS concentration calculated in the hypothetical scenario discussed above was less than 500 mg/L, and this is not likely to cause acute lethality effects on resident fish species. Besides elevated TDS, there are other constituents in the MWS-01 effluent that may harm fish, however; these were generally below (SE 2006) water quality objectives at station WRS-03 and stations NSRS-01 and NSRS-02 in the river. As this study is focusing on elevated TDS as the primary parameter of concern, the sensitivity of test and indigenous fish species to elevated TDS and chloride (particularly sodium chloride) will be compared in a general manner[2]. Standard laboratory toxicity results were not available for the majority of the resident fish species listed in Table 7.

Several studies have examined the salinity tolerance of resident fish species at different life stages, end points, and salinity types. Walleye (*Stizostedion vitreum*) fry displayed more sensitivity to sodium chloride than lake whitefish fry (*Coregonus clupeaformis*), however; the effects (e.g., immobilization of fry) occurred at extremely high concentrations of 3,000 mg/L and 16,000 mg/L (Evans and Frick 2001). Northern pike (*Esox lucius*) fry displayed an upper tolerance limit between 1,000 and 3,000 mg/L TDS (Peterka and Hendrickson 1990, TAEM 1994). The reproduction of white sucker (*Catostomus commersoni*) were impaired at 3,000 mg/L TDS in sodium carbonate and sodium sulphate type water from a Saskatchewan lake (Schryer 1993).

Fathead minnows, brook stickleback (*Culaea inconstans*), ninespine stickleback (*Pungitius pungitius*), Iowa darter (*Etheostoma exile*), and perch (*Perca spp*.) are among the fish species resident to Saskatchewan that are more tolerant to elevated TDS (TAEM 1994, Goodfellow et al. 2000, Evans and Frick 2001, CanNorth 2004a). Mean 96-hour LC50 for fathead minnow was found to be 6,390 mg/L sodium chloride at temperatures of 25°C in a study by Mount et al. (1997), and 10,800 mg/L in a study by Birge et al. (1985) (USEPA 1988). In comparison to fathead minnow results, the mean 96-hour LC50 value for rainbow trout indicated a lower tolerance to chloride salinity; the LC50 concentration determined in the potassium chloride reference toxicant tests by Stantec was 3,815 mg/L. Other studies estimated the LC50 of rainbow trout to be 2,500 mg/L (Beak 1999, CEPA 2001).

[2] It is noted that quantitative comparisons can only be made within individual studies, due to differences in test methods, including water temperature, hardness, exposure time, species, life stage, and salinity type.

Elevated salinity levels may produce chronic effects in fish related to growth and reproduction due to the energy-taxing requirements of osmoregulation (Goodfellow et al. 2000). Through the testing of reference toxicants consisting of potassium chloride, the toxicity laboratory determined that the mean survival IC25 value for fathead minnow was 690 mg/L. In comparison, adverse chronic effects from chloride occurred in nine freshwater species in concentrations ranging from 735 mg/L to 4,681 mg/L in British Columbia (Nagpal et al. 2003). In comparison, the concentration of chloride measured in water from station WRS-03 exceeded 800 mg/L. Fathead minnows experienced chronic effects from a chloride concentration of 433 mg/L (Birge et al. 1985, USEPA 1988); however, the test water hardness was lower than that measured in this study at the sampling stations and also in the river. There was no observed effect during a 33-day early life stage test on fathead minnows at a chloride concentration of 252 mg/L (Evans and Frick, CEPA 2001). It is noted that the tolerance of aquatic organisms to chloride can be increased gradually through acclimation, allowing them to develop mechanisms for dealing with osmotic shock and other physiological stresses (Evans and Frick 2001).

4.0 SUMMARY AND CONCLUSIONS

The Saskatchewan Surface Water Quality Objectives effluent release guidelines state that effluent releases should avoid causing acute lethality or harm to aquatic organisms (SE 2006). Toxicity testing illustrated that the MWS-01 effluent at 100% concentration was not acutely toxic to the test species, including rainbow trout and *D. magna*. However, chronic effects occurred for 25% of the *C. dubia* population tested (IC25) in the MWS-01 concentration of 4.1%. In addition, there was some impediment of lesser duckweed frond production but no significant effect by weight.

The high TDS of 4,360 mg/L in test sample MWS-01 could have accounted for the effects on survival and reproduction observed. The EPA noted that if the TDS is greater than approximately 1,340 mg/L, toxicity due to ion imbalance is likely (Specht 2005). In-house reference toxicant testing using sodium chloride (completed by the toxicity laboratory) has previously shown similar effects on survival and reproduction of *C. dubia* (Stantec, Pers. Comm.). However, it is noteworthy that no acute or chronic effects occurred on any test species in the West Ravine sample, which had a TDS concentration of 1,870 mg/L. The higher hardness at WRS-03 may be one factor contributing to the lack of chronic effects in this test sample. Lasier et al. (2006) speculated that this would be a function of the role of calcium and magnesium in mitigating ionic imbalances. TDS alone may not be the cause of the toxicity effects on test species, as there were other constituents in MWS-01 that were equal to or above CCME (2005) guidelines including aluminium, ammonia-N, cadmium, chromium, and selenium. Further toxicity testing may be required to identify contaminants of concern to aquatic life other than elevated TDS.

The indigenous fish population of the Saskatchewan River is not likely to be affected by effluent currently released to the environment from the Star Diamond Project. This is supported by the lack of adverse acute and sublethal toxicity effects at station WRS-03. No chronic effects occurred to fathead minnow in this study; however, this species may be considered to be relatively tolerant of elevated salinity (TAEM 1994, Goodfellow et al. 2000, Evans and Frick 2001, CanNorth 2004a). Water quality from MWS-01 was characterized by high TDS, and dominated by chloride and sodium ions. The concentrations of TDS and other potentially harmful constituents in the effluent were much lower at station WRS-03, compared to station MWS-01. In addition, there was no increase in these constituents from station NSRS-01, located on the Saskatchewan River

upstream of the project, to station NSRS-02, located on the Saskatchewan River downstream of WRS-03. Finally, the Saskatchewan River has sufficient assimilation capacity, even at the estimated 7Q10 low streamflow criteria.

The elevated TDS in the Star Diamond Project effluent was the focus of this study. The hypothetical loading to the river of a range of effluent TDS concentrations was calculated to assist in evaluating potential effects to aquatic life. It was determined that under the specified worst-case scenario conditions, TDS would not be elevated above 500 mg/L downstream of the project in the Saskatchewan River. At TDS concentrations near 500 mg/L, it is possible that there would be chronic effects to aquatic life, as previous studies have shown (Evans and Frick 2001, CEPA 2001, Nagpal et al. 2003).

It is not recommended that the project release effluent that would significantly increase the TDS concentration in the Saskatchewan River. As sodium and chloride are the primary constituents of TDS at the stations assessed, it is recommended that water quality objectives set for the Saskatchewan River at the mouth of the Carrot River, farther downstream (PPWB 2003) for dissolved sodium (100 mg/L) and dissolved chloride (68 mg/L), also be met downstream of this project.

The Saskatchewan River is a multiple use watershed and the Shore Gold effluent is not the only potential source of contamination. Cumulative effects on river water quality may result from other major effluent releases into the Saskatchewan River upstream of this project. The pulp and paper mill at Prince Albert released effluent into the North Saskatchewan River upstream of the project until its recent closure. However, this plant may be reopened again in the future. Major cities on the rivers in Saskatchewan that release domestic wastewater include Saskatoon, North Battleford, and Prince Albert. In addition, Edmonton releases wastewater on the North Saskatchewan River. Cumulative effects on water quality should be taken into account before any changes are made to the Shore Gold effluent composition or discharge.

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TABLES

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TABLE 1

Water chemistry results from stations MWS-01 and WRS-03 collected in January 2007 at the Star Diamond Project, Saskatchewan, and stations NSRS-01 and NSRS-02 on the Saskatchewan River, compared to Saskatchewan Environment (2006) water quality objectives.

Total Metals and Anions	Units	SE (2006)	WRS-03 Jan-07	MWS-01 Jan-07	NSRS-01 July 2006	NSRS-02 July 2007
Aluminium [1]	mg/L	0.1	0.04	2.91	0.14	0.14
Ammonia - N [2]	mg/L	2.33, 0.232	<0.05	1.6	0.05	0.03
Antimony	mg/L	-	<0.005	n/c	<0.0002	<0.0002
Arsenic	mg/L	0.005	0.002	0.003	0.0009	0.0009
Barium	mg/L	-	0.34	0.03	0.084	0.083
Beryllium	mg/L	-	<0.001	<0.001	<0.0001	<0.0001
Bicarbonate	mg/L	-	248	237	188	188
Bismuth	mg/L	-	<0.001	<0.001	-	-
Boron	mg/L	-	0.67	2.28	0.02	0.02
Bromide	mg/L	-	0.5	1.4	-	-
Cadmium [3]	mg/L	0.0001	0.0001	0.0004	<0.0001	<0.0001
Calcium	mg/L	-	114	23.9	47	49
Carbonate	mg/L	-	<10	13	5	5
Chloride	mg/L	-	810	2120	7	6
Chromium	mg/L	0.001	<0.001	0.012	<0.0005	<0.0005
Cobalt	mg/L	-	<0.0005	0.0006	0.0003	0.0003
Copper [3]	mg/L	0.003	0.001	0.002	0.0009	0.0009
Fluoride	mg/L	-	<0.1	0.6	0.1	0.13
Hydroxide	mg/L	-	<5.0	<5.0	<1	<1
Iron	mg/L	0.3	0.73	<0.05	0.28	0.3
Lead [3]	mg/L	0.004	<0.001	<0.001	0.0002	0.0002
Magnesium	mg/L	-	21	77.4	17	17
Manganese	mg/L	-	0.294	0.002	0.021	0.021
Molybdenum	mg/L	-	0.002	0.012	0.0011	0.0011
Nickel [3]	mg/L	0.110	0.005	0.029	0.0013	0.0013
Nitrate	mg/L	-	0.1	1.6	0.04	<0.04
Nitrite	mg/L	-	<0.5	<0.5	-	-
Organic carbon, dissolved	mg/L	-	5	2	4.9	4.7
pH	pH units	-	7.93	8.76	8.45	8.45
Phosphate-P (ortho)	mg/L	-	<0.3	n/c	-	-
Potassium	mg/L	-	3	32	2.6	2.7
Selenium	mg/L	0.001	0.006	0.012	0.0004	0.0004
Silicon	mg/L	-	5.7	22.6	-	-
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	mg/L	-	500	1587	18	17
Specific Conductivity	µS/cm	-	3345	7788	443	436
Strontium	mg/L	-	0.249	0.538	0.38	0.38
Sulphate	mg/L	-	168	442	64	65
Thallium	mg/L	-	<0.0003	<0.0003	<0.0002	<0.0002
Tin	mg/L	-	<0.001	<0.001	<0.0001	<0.0001
Titanium	mg/L	-	0.005	0.391	0.0032	0.0032
Tungsten	mg/L	-	<0.01	<0.01	-	-
Total alkalinity	mg/L	-	250	250	162	162

TABLE 1

Water chemistry results from stations MWS-01 and WRS-03 collected in January 2007 at the Star Diamond Project, Saskatchewan, and stations NSRS-01 and NSRS-02 on the Saskatchewan River, compared to Saskatchewan Environment (2006) water quality objectives.

Total Metals and Anions	Units	SE (2006)	WRS-03 Jan-07	MWS-01 Jan-07	NSRS-01 July 2006	NSRS-02 July 2007
Total dissolved solids	mg/L	-	1870	4360	253	247
Total hardness	mg/L	-	420	160	187	192
Total Kjeldahl nitrogen	mg/L	-	0.3	n/c	0.73	2.1
Turbidity	NTU	-	2.7	2.9	16	18
Uranium	mg/L	0.015	<0.005	<0.005	0.0011	0.0010
Vanadium	mg/L	-	<0.001	0.016	0.0009	0.001
Zinc	mg/L	0.03	<0.003	<0.003	0.0009	0.0014
Zirconium	mg/L	-	<0.004	<0.004	-	-

n/c = not completed.

Note 1: Only those SE (2006) water quality objectives for the protection of aquatic life are included.

[1] The water quality objective for aluminium was determined from the pH, Calcium concentration, and DOC of each sample as described in SE (2006).

[2] The water quality objective for ammonia-N was determined to be 2.33 mg/L for WRS-03 and 0.232 mg/L for MWS-01 from the pH and field temperature of each sample, using Table 4.1.1 of SE (2006).

[3] The water quality objective for cadmium, copper, lead, and nickel were determined from the hardness of each sample as described in SE (2006). The lower water quality objectives are provided; these were all based on the hardness value of 160 mg/L from the MWS-01 station.

TABLE 2

Total and dissolved metal concentrations from stations MWS-01 and WRS-03 at the Star Diamond Project, Saskatchewan, collected in January 2007.

Parameter	Units	Detection Limit	WRS-03		MWS-01	
			Total	Dissolved	Total	Dissolved
Aluminium	mg/L	0.01	0.04	<0.01	2.91	0.01
Antimony	mg/L	0.005	<0.005	<0.005	n/c	n/c
Arsenic	mg/L	0.001	0.002	0.001	0.003	0.003
Barium	mg/L	0.01	0.34	0.33	0.03	0.03
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.05	0.67	0.70	2.28	2.78
Cadmium	mg/L	0.0001	0.0001	<0.0001	0.0004	0.0004
Calcium	mg/L	0.5	114	116	23.9	12.4
Chromium	mg/L	0.001	<0.001	<0.001	0.012	0.012
Cobalt	mg/L	0.0005	<0.0005	<0.0005	0.0006	0.0006
Copper	mg/L	0.001	0.001	0.001	0.002	0.002
Iron	mg/L	0.05	0.73	<0.05	<0.05	<0.05
Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Magnesium	mg/L	0.5	21	21.3	77.4	21.6
Manganese	mg/L	0.001	0.294	0.259	0.002	0.002
Molybdenum	mg/L	0.001	0.002	0.002	0.012	0.012
Nickel	mg/L	0.002	0.005	0.005	0.029	0.029
Phosphorus	mg/L	0.05	<0.05	<0.05	0.39	<0.05
Potassium	mg/L	1	3	3	32	33
Selenium	mg/L	0.005	0.006	0.015	0.012	0.012
Silicon	mg/L	0.1	5.7	7.6	22.6	3.8
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	mg/L	0.5	500	500	1587	1587
Strontium	mg/L	0.001	0.249	0.243	0.538	0.538
Thallium	mg/L	0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Titanium	mg/L	0.002	0.005	<0.002	0.391	0.007
Tungsten	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
Uranium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Vanadium	mg/L	0.001	<0.001	<0.001	0.016	0.003
Zinc	mg/L	0.003	<0.003	<0.003	<0.003	<0.003
Zirconium	mg/L	0.004	<0.004	<0.004	<0.004	<0.004

n/c = analysis not completed.

TABLE 3

Major ion balances for water samples from stations WRS-03 and MWS-01 collected in January 2007, and stations NSRS-01 and NSRS-02 collected in July 2006 at the Star Diamond Project, Saskatchewan.

Station	Cations					Anions				
	Calcium (Ca^{2+})	Magnesium (Mg^{2+})	Sodium (Na^{+})	Potassium (K^{+})	SUM	Chloride (Cl^{-})	Carbonate (CO_3^{2-})	Bicarbonate (HCO_3^{-})	Sulphate (SO_4^{2-})	SUM
Concentration (Mg/L)										
MWS-01	12.4	21.6	1575	33.0		2120	13	237	442	
WRS-03	116	21.3	500	3.0		810	10	248	168	
NSRS-01	47	17	18	2.6		7	5	188	64	
NSRS-02	49	17	17	2.7		6	5	188	65	
Milliequivalent wt.	20.0	12.2	23.0	39.1	-	35.5	30.0	61.0	48.0	-
Milliequivalents per litre (Meq/L)										
MWS-01	0.62	1.8	68.5	0.84	**72**	59.8	0.4	3.9	9.2	**73**
WRS-03	5.8	1.8	21.7	0.077	**29**	22.8	0.3	4.1	3.5	**31**
NSRS-01	2.3	1.4	0.78	0.066	**4.6**	0.2	0.2	3.1	1.3	**4.8**
NSRS-02	2.4	1.4	0.74	0.069	**4.7**	0.2	0.2	3.1	1.4	**4.8**
Percent of major ions (%)										
MWS-01	0.9	2.5	95.5	1.2	100	81.5	0.6	5.4	12.8	100
WRS-03	19.7	6.0	74.1	0.3	100	74.3	1.1	13.8	11.9	100
NSRS-01	51.1	30.4	17.0	1.4	100	4.1	3.6	67.1	29.0	100
NSRS-02	52.6	30.1	15.9	1.5	100	3.5	3.6	66.3	29.1	100

Note 1: The sum of cations and anions in Meq/L should be approximately equal (within approximately 5%).

TABLE 4

Water chemistry parameters measured in association with toxicity analyses from stations WRS-03 and MWS-01 at the Star Diamond Project, Saskatchewan.

Station	Toxicity Test	Species	Hardness (mg/L as $CaC0_3$)	pH	D.O. (mg/L)	Cond. (µS /cm)	Temp. (°C)	O_2 Saturation (%)
WRS-03	EPS 1/RM/14	Water flea: *D. magna*	420	7.8	10.7	3270	19.0	121
	EPS 1/RM/13	Rainbow trout	-	7.9	10.0	3428	14.0	100
	EPS 1/RM/21	Water flea: *C. dubia*	420	7.7	8.9	3340	25.0	113
	EPS 1/RM/22	Fathead minnow	420	7.7	8.9	3340	25.0	113
	EPS 1/RM/25	Green algae	-	7.8	-	-	24.9	-
	EPS 1/RM/37	Lesser duckweed	-	7.8	-	-	25.0	-
MWS-01	EPS 1/RM/14	Water flea: *D. magna*	160	9.0	9.8	7580	19.5	113
	EPS 1/RM/13	Rainbow trout	-	8.9	9.7	8010	14.0	100
	EPS 1/RM/21	Water flea: *C. dubia*	160	8.7	7.9	7780	25.0	100
	EPS 1/RM/22	Fathead minnow	160	8.7	7.9	7780	25.0	100
	EPS 1/RM/25	Green algae	-	8.8	-	-	24.9	-
	EPS 1/RM/37	Lesser duckweed	-	8.8	-	-	25.0	-

Note 1: The specific conductivity measured in the Saskatchewan River in July 2006 was 440 µS/cm, which is similar to the mean conductivity of the laboratory test dilution water of 560 µS/cm.

TABLE 5

Frequency of annual 7-day minimum streamflow[1] (1975 to 2005) for the Saskatchewan River near the Star Diamond Project, Saskatchewan.

Average return interval (years)	Combined flow from 05GG001 and 05HG001 near the study area.	
	7-day low flow (m^3/s)	7-day average low flow (m^3/s)
2	1475	211
5	1262	180
10	**1144**	**163** [2]
20	1042	149
30	988	141
50	925	132
75	878	125
100	846	121

[1] Extreme Value Type III distribution fitted by probability-weighted moments to the 7-day annual minimum streamflows using Aquapak software (Gordon et al. 2004).

[2] This is the daily average flow representing the 7Q10 streamflow criteria.

TABLE 6

Hypothetical concentrations of TDS calculated with the 7Q10 streamflow criteria for the receiving environment - the Saskatchewan River near the Star Diamond Project, Saskatchewan.

Wastewater TDS (mg/L)	**Downstream TDS at 7Q10 (mg/L)**	**Downstream TDS at mean streamflow (mg/L)**	**Daily TDS load at 7Q10 ($g/m^3/day$)**
10000	495	347	8.1×10^4
7500	432	322	7.0×10^4
5000	369	297	6.0×10^4
4360	**353**	**291**	**5.8×10^4**
3000	319	277	5.2×10^4
1000	269	257	4.4×10^4
500	256	252	4.2×10^4

Note 1: The actual TDS measured at station MWS-01 in January 2007, and predicted for the receiving environment is in bold print.

Note 2: Baseline TDS in the Saskatchewan River upstream and downstream of the project was measured in July 2006 to be 250 mg/L at stations NSRS-01 and NSRS-02.

TABLE 7

List of fish species known to occur in the Saskatchewan River in Saskatchewan.

Family	Scientific Name	Common Name
Acipenseridae	*Acipenser fulvescens*	Lake sturgeon
Salmonidae	*Oncorhynchus mykiss*	Rainbow trout [1]
	Salvelinus fontinalis	Brook trout
	Coregonus artedii	Cisco
	Coregonus clupeaformis	Lake whitefish
Hiodontidae	*Hoidon alosoides*	Goldeye
	Hiodon tergisus	Mooneye
Esocidae	*Esox lucius*	Northern pike
Cyprinidae	*Couesius plumbeus*	Lake chub
	Notropis atherinoides	Emerald shiner
	Notropis blennius	River shiner
	Notropis hudsonius	Spottail shiner
	Pimephales promelas	Fathead minnow [1]
	Hybopsis gracilis	Flathead chub
	Rhinichthys cataractae	Longnose dace
	Chrosomus eos	Northern redbelly dace
	Semotilus margarita	Pearl dace
Catostomidae	*Carpiodes cyprinus*	Quillback
	Catostomus catostomus	Longnose sucker
	Catostomus commersoni	White sucker
	Catostomus platyrhynchus	Mountain sucker
	Moxostoma anisurum	Silver redhorse
	Moxostoma macrolepidotum	Shorthead redhorse
Gadidae	*Lota lota*	Burbot
Gasterosteidae	*Culaea inconstans*	Brook stickleback
Percopsidae	*Percopsis omiscomaycus*	Trout-perch
Percidae	*Perca flavescens*	Yellow perch
	Stizostedion canadense	Sauger
	Sander vitreus	Walleye
	Etheostoma exile	Iowa darter
Cottidae	*Cottus ricei*	Spoonhead sculpin
Umbridae	*Umbra limi*	Central mudminnow

Sources: (Reed 1962, Atton and Merkowsky 1983, Merkowsky 1988, Miles and Sawchyn 1988, SPRR 1991, Scott and Crossman 1998, Conor Pacific and Clifton 1999, Conor Pacific 1999, and CanNorth 2004b).

[1] Toxicity analyses were completed for these species.

FIGURES

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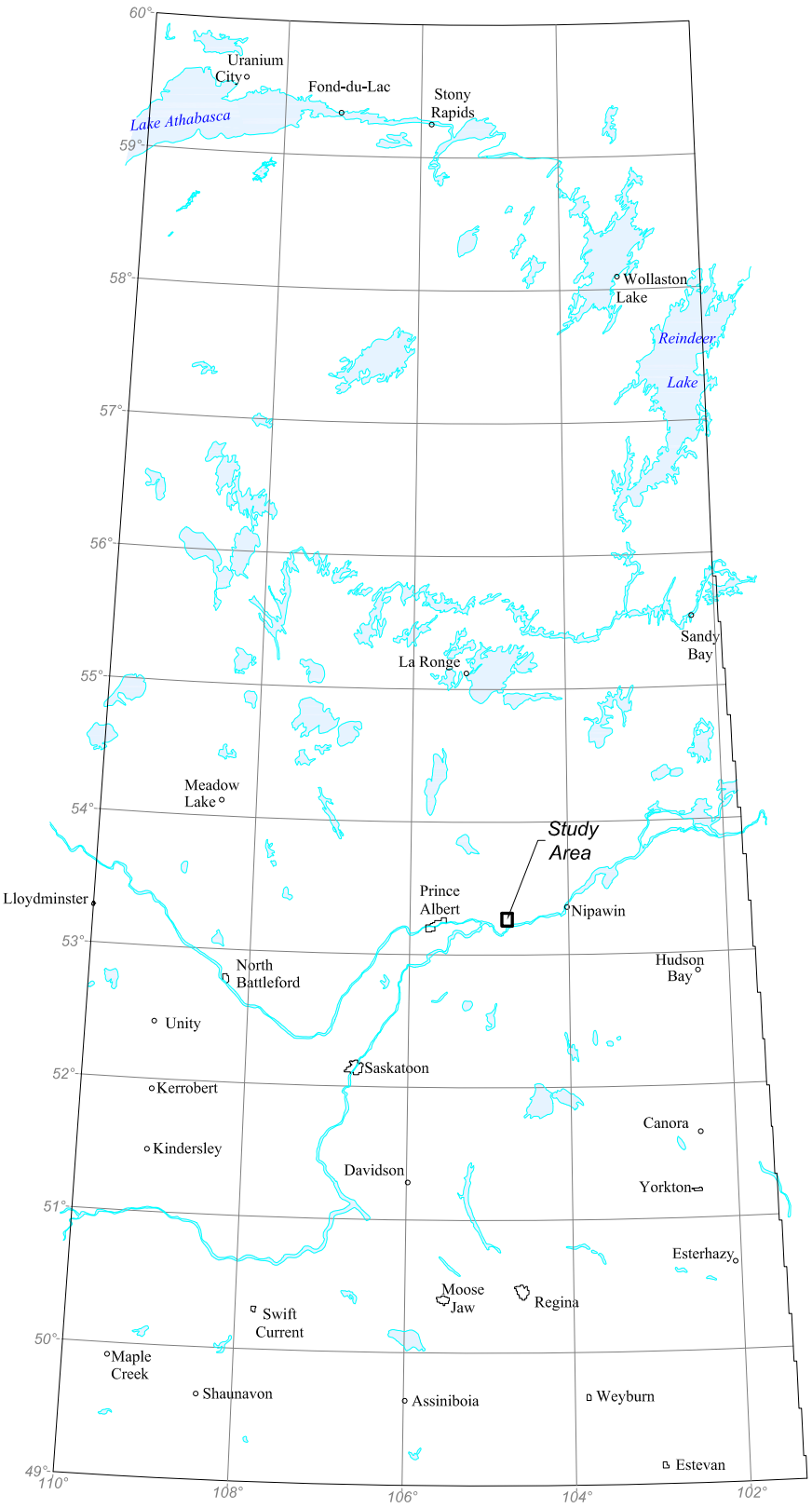

Figure 1 Study location.

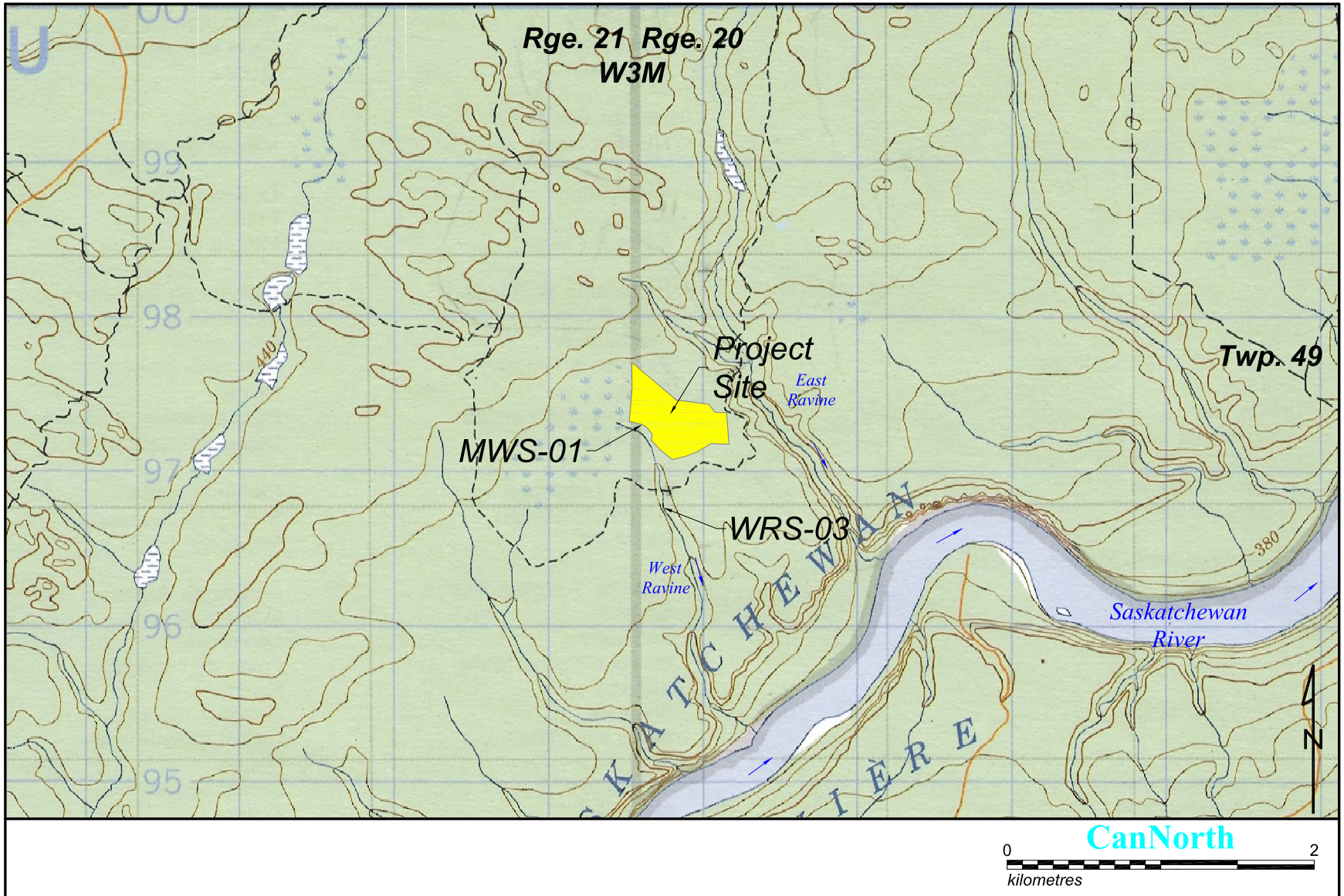

Figure 2
The location of the MWS-01 and WRS-03 water sampling stations at the Star Diamond Project, Saskatchewan.

APPENDICES

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APPENDIX A

WATER QUALITY TEST RESULTS FROM STATIONS MWS-01 AND WRS-03, JANUARY 2007

APPENDIX A

STATION MWS-01

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

ANALYTICAL REPORT

STANTEC CONSULTING LTD
ATTN: KEITH HOLTZE/MARTINA RENDAS
11B NICHOLAS BEAVER PARK ROAD
GUELPH ON N1H 6H9

Reported On: 27-FEB-07 10:36 AM
Revision: 2

Lab Work Order #: L467510 MW5-01 Date Received: 04-JAN-07

Project P.O. #: 162704383
Job Reference: 162704383
Legal Site Desc:
CofC Numbers:

Other Information:

Comments: Feb.8/07 : a revised report was issued to show the re-analysis value for Na : 1587 mg/L. The original value reported was: 67.5 mg/L. A recheck (RC11575 was completed and a Corrective Action Report has been initiated)
DHS

<original signed by>

APPROVED BY: _____
DARLENE HODGENES-STASTNY
Project Manager

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A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By.	Batch
L467510-1 17673								
Sampled By: Stantec on 04-JAN-07 @ 13:00								
Matrix: WATER								
Ammonia as N	1.60		0.05	mg/L	05-JAN-07	05-JAN-07	AF	R481313
Anion Scan (IC)								
Chloride	2120		2	mg/L	08-JAN-07	08-JAN-07	KA	R481990
Bromide	1.4		0.1	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Fluoride	0.6		0.1	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Nitrite-N	<0.5		0.5	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Nitrate-N	1.6		0.1	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Sulphate	442		2	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Dissolved Organic Carbon	2		1	mg/L	05-JAN-07	05-JAN-07	SARA	R481663
Hydroxide (OH)	<5		5	mg/L	08-JAN-07	08-JAN-07	JIC	R482060
Metal Scan-Dissolved								
Aluminum (Al)-Dissolved	0.01		0.01	mg/L		11-JAN-07	JS	R482884
Arsenic (As)-Dissolved	0.003		0.001	mg/L		11-JAN-07	JS	R482884
Barium (Ba)-Dissolved	0.03		0.01	mg/L		11-JAN-07	JS	R482884
Beryllium (Be)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Bismuth (Bi)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Boron (B)-Dissolved	2.78		0.05	mg/L		11-JAN-07	JS	R482884
Cadmium (Cd)-Dissolved	0.0004		0.0001	mg/L		11-JAN-07	JS	R482884
Calcium (Ca)-Dissolved	12.4		0.5	mg/L		11-JAN-07	JS	R482884
Chromium (Cr)-Dissolved	0.012		0.001	mg/L		11-JAN-07	JS	R482884
Cobalt (Co)-Dissolved	0.0006		0.0005	mg/L		11-JAN-07	JS	R482884
Copper (Cu)-Dissolved	0.002		0.001	mg/L		11-JAN-07	JS	R482884
Iron (Fe)-Dissolved	<0.05		0.05	mg/L		11-JAN-07	JS	R482884
Lead (Pb)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Magnesium (Mg)-Dissolved	21.6		0.5	mg/L		11-JAN-07	JS	R482884
Manganese (Mn)-Dissolved	0.002		0.001	mg/L		11-JAN-07	JS	R482884
Molybdenum (Mo)-Dissolved	0.012		0.001	mg/L		11-JAN-07	JS	R482884
Nickel (Ni)-Dissolved	0.029		0.002	mg/L		11-JAN-07	JS	R482884
Phosphorus (P)-Dissolved	<0.05		0.05	mg/L		11-JAN-07	JS	R482884
Potassium (K)-Dissolved	33		1	mg/L		11-JAN-07	JS	R482884
Selenium (se)-Dissolved	0.012		0.005	mg/L		11-JAN-07	JS	R482884
Silicon (Si)-Dissolved	3.8		0.1	mg/L		11-JAN-07	JS	R482884
Silver (Ag)-Dissolved	<0.0001		0.0001	mg/L		11-JAN-07	JS	R482884
Sodium (Na)-Dissolved	60.7		0.5	mg/L		11-JAN-07	JS	R482884
Strontium (Sr)-Dissolved	0.538		0.001	mg/L		11-JAN-07	JS	R482884
Thallium (Tl)-Dissolved	<0.0003		0.0003	mg/L		11-JAN-07	JS	R482884
Tin (Sn)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Titanium (Ti)-Dissolved	0.007		0.002	mg/L		11-JAN-07	JS	R482884
Tungsten (W)-Dissolved	<0.01		0.01	mg/L		11-JAN-07	JS	R482884
Uranium (U)-Dissolved	<0.005		0.005	mg/L		11-JAN-07	JS	R482884
Vanadium (V)-Dissolved	0.003		0.001	mg/L		11-JAN-07	JS	R482884
Zinc (Zn)-Dissolved	<0.003		0.003	mg/L		11-JAN-07	JS	R482884
Zirconium (Zr)-Dissolved	<0.004		0.004	mg/L		11-JAN-07	JS	R482884
Metal Scan-Total								
Aluminum (Al)-Total	2.91		0.01	mg/L		11-JAN-07	JS	R482884
Antimony (Sb)-Total	0.005		0.005	mg/L		11-JAN-07	JS	R482884
Arsenic (As)-Total	0.003		0.001	mg/L		11-JAN-07	JS	R482884
Barium (Ba)-Total	0.03		0.01	mg/L		11-JAN-07	JS	R482884
Beryllium (Be)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Bismuth (Bi)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Boron (B)-Total	2.28		0.05	mg/L		11-JAN-07	JS	R482884

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L467510-1 17673								
Sampled By: Stantec on 04-JAN-07 @ 13:00								
Matrix: WATER								
Metal Scan-Total								
Cadmium (Cd)-Total	0.0004		0.0001	mg/L		11-JAN-07	JS	R482884
Calcium (Ca)-Total	23.9		0.5	mg/L		11-JAN-07	JS	R482884
Chromium (Cr)-Total	0.012		0.001	mg/L		11-JAN-07	JS	R482884
Cobalt (Co)-Total	0.0006		0.0005	mg/L		11-JAN-07	JS	R482884
Copper (Cu)-Total	0.002		0.001	mg/L		11-JAN-07	JS	R482884
Iron (Fe)-Total	<0.05		0.05	mg/L		11-JAN-07	JS	R482884
Lead (Pb)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Magnesium (Mg)-Total	77.4		0.5	mg/L		11-JAN-07	JS	R482884
Manganese (Mn)-Total	0.002		0.001	mg/L		11-JAN-07	JS	R482884
Molybdenum (Mo)-Total	0.012		0.001	mg/L		11-JAN-07	JS	R482884
Nickel (Ni)-Total	0.029		0.002	mg/L		11-JAN-07	JS	R482884
Phosphorus (P)-Total	0.39		0.05	mg/L		11-JAN-07	JS	R482884
Potassium (K)-Total	32		1	mg/L		11-JAN-07	JS	R482884
Selenium (Se)-Total	0.012		0.005	mg/L		11-JAN-07	JS	R482884
Silicon (Si)-Total	22.6		0.1	mg/L		11-JAN-07	JS	R482884
Silver (Ag)-Total	<0.0001		0.0001	mg/L		11-JAN-07	JS	R482884
Sodium (Na)-Total	1600		0.5	mg/L		11-JAN-07	JS	R482884
Strontium (Sr)-Total	0.538		0.001	mg/L		11-JAN-07	JS	R482884
Thallium (Tl)-Total	<0.0003		0.0003	mg/L		11-JAN-07	JS	R482884
Tin (Sn)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Titanium (Ti)-Total	0.391		0.002	mg/L		11-JAN-07	JS	R482884
Tungsten (W)-Total	<0.01		0.01	mg/L		11-JAN-07	JS	R482884
Uranium (U)-Total	<0.005		0.005	mg/L		11-JAN-07	JS	R482884
Vanadium (V)-Total	0.016		0.001	mg/L		11-JAN-07	JS	R482884
Zinc (Zn)-Total	<0.003		0.003	mg/L		11-JAN-07	JS	R482884
Zirconium (Zr)-Total	<0.004		0.004	mg/L		11-JAN-07	JS	R482884
Speciated Alkalinity								
Alkalinity, Total (as CaCO3)	250		10	mg/L	10-JAN-07	10-JAN-07	AF	R482382
Alkalinity, Bicarbonate (as CaCO3)	237		10	mg/L	10-JAN-07	10-JAN-07	AF	R482382
Alkalinity, Carbonate (as CaCO3)	13		10	mg/L	10-JAN-07	10-JAN-07	AF	R482382
Total Dissolved Solids	4360		20	mg/L	08-JAN-07	09-JAN-07	SARA	R482098
Turbidity	2.9		0.1	NTU	06-JAN-07	06-JAN-07	BZ	R481527
pH	8.76		0.01	pH units	09-JAN-07	09-JAN-07	BZ	R482207

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

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
ALK-SPEC-WT	Water	Speciated Alkalinity		APHA 2320B
ANIONS-WT	Water	Anion Scan (IC)		EPA 300.0 (IC)
C-DIS-ORG-WT	Water	Dissolved Organic Carbon		APHA 5310 B-Instrumental
MET-DIS-WT	Water	Metal Scan-Dissolved		EPA 200.8
MET-TOT-WT	Water	Metal Scan-Total		EPA 200.8
NH3-WT	Water	Ammonia as N		APHA 4500-NH3
OH-TB	Water	Hydroxide		APHA 2320 B-Potentiometric Titration
PH-WT	Water	pH		APHA 4500 H-Electrode
SOLIDS-TDS-WT	Water	Total Dissolved Solids		APHA 2540C
TKN-WT	Water	Total Kjeldahl Nitrogen		APHA 4500-N
TURBIDITY-WT	Water	Turbidity		APHA 2130 B

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

Chain of Custody numbers:

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

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
TB	ALS LABORATORY GROUP - THUNDER BAY, ONTARIO, CANADA	WT	ALS LABORATORY GROUP - WATERLOO (SENTINEL), ONTARIO, CAN

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

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

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

ALS Laboratory Group Quality Control Report

Workorder: L467510 Report Date: 27-FEB-07

Client: STANTEC CONSULTING LTD
11B NICHOLAS BEAVER PARK ROAD
GUELPH ON N1H 6H9

Contact: KEITH HOLTZE/MARTINA RENDAS

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-SPEC-WT	**Water**							
Batch R482382								
WG545388-2 CVS								
Alkalinity, Total (as CaCO3)			97		%		80-120	10-JAN-07
WG545388-3 DUP		L467441-1						
Alkalinity, Bicarbonate (as CaCO3)		185	176		mg/L	5.4	25	10-JAN-07
Alkalinity, Carbonate (as CaCO3)		<10	<10	RPD-NA	mg/L	N/A	25	10-JAN-07
Alkalinity, Total (as CaCO3)		190	180		mg/L	5.4	25	10-JAN-07
WG545388-1 MB								
Alkalinity, Bicarbonate (as CaCO3)			<10		mg/L		10	10-JAN-07
Alkalinity, Carbonate (as CaCO3)			<10		mg/L		10	10-JAN-07
Alkalinity, Total (as CaCO3)			<10		mg/L		10	10-JAN-07
ANIONS-WT	**Water**							
Batch R481872								
WG544507-9 DUP		WG544507-4						
Bromide		1.0	1.0		mg/L	2.0	25	05-JAN-07
Chloride		20	20	J	mg/L	0	8	05-JAN-07
Fluoride		1.0	1.0	J	mg/L	0.0	0.4	05-JAN-07
Nitrate-N		0.9	0.9	J	mg/L	0.0	0.4	05-JAN-07
Nitrite-N		0.9	0.9	J	mg/L	0.0	0.4	05-JAN-07
Phosphate-P (ortho)		0.9	0.9	J	mg/L	0.0	1.2	05-JAN-07
Sulphate		20	20	J	mg/L	0	8	05-JAN-07
WG544507-3 LCS								
Bromide			102		%		80-120	05-JAN-07
Chloride			96		%		80-120	05-JAN-07
Fluoride			97		%		75-125	05-JAN-07
Nitrate-N			100		%		80-120	05-JAN-07
Nitrite-N			99		%		80-120	05-JAN-07
Phosphate-P (ortho)			91		%		63-138	05-JAN-07
Sulphate			97		%		80-120	05-JAN-07
WG544507-1 MB								
Bromide			<0.1		mg/L		0.1	05-JAN-07
Chloride			<2		mg/L		2	05-JAN-07
Fluoride			<0.1		mg/L		0.1	05-JAN-07
Nitrate-N			<0.1		mg/L		0.1	05-JAN-07
Nitrite-N			<0.1		mg/L		0.1	05-JAN-07
Phosphate-P (ortho)			<0.3		mg/L		0.3	05-JAN-07

ALS Laboratory Group Quality Control Report

Workorder: L467510 Report Date: 27-FEB-07

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ANIONS-WT	Water							
Batch R481872								
WG544507-1 MB								
Sulphate			<2		mg/L		2	05-JAN-07
Batch R481990								
WG545110-6 DUP		WG545110-4						
Bromide		1.0	1.0	J	mg/L	0.0	0.4	08-JAN-07
Chloride		19	19	J	mg/L	0	8	08-JAN-07
Fluoride		1.0	1.0		mg/L	0.0	20	08-JAN-07
Nitrate-N		0.9	0.9	J	mg/L	0.0	0.4	08-JAN-07
Nitrite-N		0.9	0.9	J	mg/L	0.0	0.4	08-JAN-07
Sulphate		20	20	J	mg/L	0	8	08-JAN-07
WG545110-3 LCS								
Bromide			100		%		80-120	08-JAN-07
Chloride			95		%		80-120	08-JAN-07
Fluoride			97		%		75-125	08-JAN-07
Nitrate-N			98		%		80-120	08-JAN-07
Nitrite-N			100		%		80-120	08-JAN-07
Sulphate			95		%		80-120	08-JAN-07
WG545110-1 MB								
Bromide			<0.1		mg/L		0.1	08-JAN-07
Chloride			<2		mg/L		2	08-JAN-07
Fluoride			<0.1		mg/L		0.1	08-JAN-07
Nitrate-N			<0.1		mg/L		0.1	08-JAN-07
Nitrite-N			<0.1		mg/L		0.1	08-JAN-07
Sulphate			<2		mg/L		2	08-JAN-07
C-DIS-ORG-WT	Water							
Batch R481663								
WG544294-2 DUP		L467086-1						
Dissolved Organic Carbon		2	3	J	mg/L	0	4	05-JAN-07
WG544294-3 LCS								
Dissolved Organic Carbon			98		%		77-120	05-JAN-07
WG544294-1 MB								
Dissolved Organic Carbon			<1		mg/L		1	05-JAN-07
WG544294-4 MS		L467086-2						
Dissolved Organic Carbon			103		%		60-140	05-JAN-07
WG544294-5 MSD		WG544294-4						

ALS Laboratory Group Quality Control Report

Workorder: L467510 Report Date: 27-FEB-07

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DIS-ORG-WT	Water							
Batch R481663								
WG544294-5 MSD		WG544294-4						
Dissolved Organic Carbon		103	98		%	4.4	26	05-JAN-07
MET-DIS-WT	Water							
Batch R482884								
WG546250-1 CVS								
Aluminum (Al)-Dissolved			102		%		78-129	11-JAN-07
Antimony (Sb)-Dissolved			107		%		72-130	11-JAN-07
Arsenic (As)-Dissolved			105		%		89-123	11-JAN-07
Barium (Ba)-Dissolved			104		%		82-124	11-JAN-07
Beryllium (Be)-Dissolved			97		%		84-125	11-JAN-07
Bismuth (Bi)-Dissolved			109		%		77-115	11-JAN-07
Boron (B)-Dissolved			104		%		69-129	11-JAN-07
Cadmium (Cd)-Dissolved			106		%		83-124	11-JAN-07
Calcium (Ca)-Dissolved			97		%		84-121	11-JAN-07
Chromium (Cr)-Dissolved			109		%		88-121	11-JAN-07
Cobalt (Co)-Dissolved			112		%		87-118	11-JAN-07
Copper (Cu)-Dissolved			109		%		82-124	11-JAN-07
Iron (Fe)-Dissolved			112		%		88-134	11-JAN-07
Lead (Pb)-Dissolved			111		%		80-128	11-JAN-07
Magnesium (Mg)-Dissolved			94		%		80-125	11-JAN-07
Manganese (Mn)-Dissolved			106		%		84-122	11-JAN-07
Molybdenum (Mo)-Dissolved			111		%		79-122	11-JAN-07
Nickel (Ni)-Dissolved			110		%		88-120	11-JAN-07
Phosphorus (P)-Dissolved			105		%		76-127	11-JAN-07
Potassium (K)-Dissolved			100		%		74-143	11-JAN-07
Selenium (se)-Dissolved			99		%		83-129	11-JAN-07
Silver (Ag)-Dissolved			109		%		81-121	11-JAN-07
Sodium (Na)-Dissolved			97		%		86-123	11-JAN-07
Strontium (Sr)-Dissolved			98		%		89-117	11-JAN-07
Thallium (Tl)-Dissolved			108		%		78-128	11-JAN-07
Uranium (U)-Dissolved			106		%		82-123	11-JAN-07
Vanadium (V)-Dissolved			103		%		77-123	11-JAN-07
Zinc (Zn)-Dissolved			91		%		86-126	11-JAN-07

ALS Laboratory Group Quality Control Report

Workorder: L467510 Report Date: 27-FEB-07

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-WT	Water							
Batch R482884								
WG546250-2 CVS								
Silicon (Si)-Dissolved			120		%		61-151	11-JAN-07
Tin (Sn)-Dissolved			104		%		91-139	11-JAN-07
Titanium (Ti)-Dissolved			110		%		87-120	11-JAN-07
Tungsten (W)-Dissolved			110		%		74-132	11-JAN-07
Zirconium (Zr)-Dissolved			105		%		77-128	11-JAN-07
WG546250-5 DUP		WG546250-4						
Aluminum (Al)-Dissolved		<0.01	<0.01	RPD-NA	mg/L	N/A	20	11-JAN-07
Antimony (Sb)-Dissolved		<0.005	<0.005	RPD-NA	mg/L	N/A	20	11-JAN-07
Arsenic (As)-Dissolved		0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Barium (Ba)-Dissolved		0.06	0.06	J	mg/L	0.00	0.04	11-JAN-07
Beryllium (Be)-Dissolved		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Bismuth (Bi)-Dissolved		<0.001	<0.001	RPD-NA	mg/L	N/A	26	11-JAN-07
Boron (B)-Dissolved		0.07	0.07	J	mg/L	0.00	0.2	11-JAN-07
Cadmium (Cd)-Dissolved		0.0006	0.0005	J	mg/L	0.0000	0.0004	11-JAN-07
Calcium (Ca)-Dissolved		84.5	84.1		mg/L	0.41	20	11-JAN-07
Chromium (Cr)-Dissolved		0.002	0.002	J	mg/L	0.000	0.004	11-JAN-07
Cobalt (Co)-Dissolved		0.0010	0.0010	J	mg/L	0.0000	0.002	11-JAN-07
Copper (Cu)-Dissolved		0.001	0.001	J	mg/L	0.000	0.004	11-JAN-07
Iron (Fe)-Dissolved		<0.05	<0.05	RPD-NA	mg/L	N/A	20	11-JAN-07
Lead (Pb)-Dissolved		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Magnesium (Mg)-Dissolved		30.0	29.9		mg/L	0.30	20	11-JAN-07
Manganese (Mn)-Dissolved		0.128	0.128		mg/L	0.089	20	11-JAN-07
Molybdenum (Mo)-Dissolved		0.012	0.013		mg/L	5.8	20	11-JAN-07
Nickel (Ni)-Dissolved		0.004	0.004	J	mg/L	0.000	0.008	11-JAN-07
Phosphorus (P)-Dissolved		<0.05	<0.05	RPD-NA	mg/L	N/A	20	11-JAN-07
Potassium (K)-Dissolved		3	3	J	mg/L	0	4	11-JAN-07
Selenium (se)-Dissolved		0.017	0.017	J	mg/L	0.000	0.02	11-JAN-07
Silicon (Si)-Dissolved		7.6	7.5		mg/L	0.99	20	11-JAN-07
Silver (Ag)-Dissolved		<0.0001	<0.0001	RPD-NA	mg/L	N/A	33	11-JAN-07
Sodium (Na)-Dissolved		<0.5	<0.5	RPD-NA	mg/L	N/A	20	11-JAN-07
Strontium (Sr)-Dissolved		0.225	0.229		mg/L	1.9	20	11-JAN-07
Thallium (Tl)-Dissolved		<0.0003	<0.0003	RPD-NA	mg/L	N/A	20	11-JAN-07
Tin (Sn)-Dissolved		<0.001	<0.001	RPD-NA	mg/L	N/A	26	11-JAN-07

ALS Laboratory Group Quality Control Report

Workorder: L467510 Report Date: 27-FEB-07

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-WT	**Water**							
Batch R482884								
WG546250-5 DUP		WG546250-4						
Titanium (Ti)-Dissolved		<0.002	<0.002	RPD-NA	mg/L	N/A	20	11-JAN-07
Tungsten (W)-Dissolved		<0.01	<0.01	RPD-NA	mg/L	N/A	20	11-JAN-07
Uranium (U)-Dissolved		<0.005	<0.005	RPD-NA	mg/L	N/A	20	11-JAN-07
Vanadium (V)-Dissolved		0.003	0.003	J	mg/L	0.000	0.004	11-JAN-07
Zinc (Zn)-Dissolved		0.016	0.016	J	mg/L	0.000	0.012	11-JAN-07
Zirconium (Zr)-Dissolved		<0.004	<0.004	RPD-NA	mg/L	N/A	20	11-JAN-07
WG546250-3 MB								
Aluminum (Al)-Dissolved			<0.01		mg/L		0.01	11-JAN-07
Antimony (Sb)-Dissolved			<0.005		mg/L		0.005	11-JAN-07
Arsenic (As)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Barium (Ba)-Dissolved			<0.01		mg/L		0.01	11-JAN-07
Beryllium (Be)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Bismuth (Bi)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Boron (B)-Dissolved			<0.05		mg/L		0.05	11-JAN-07
Calcium (Ca)-Dissolved			<0.5		mg/L		0.5	11-JAN-07
Chromium (Cr)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Cobalt (Co)-Dissolved			<0.0005		mg/L		0.0005	11-JAN-07
Copper (Cu)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Iron (Fe)-Dissolved			<0.05		mg/L		0.05	11-JAN-07
Lead (Pb)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Magnesium (Mg)-Dissolved			<0.5		mg/L		0.5	11-JAN-07
Manganese (Mn)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Molybdenum (Mo)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Nickel (Ni)-Dissolved			<0.002		mg/L		0.002	11-JAN-07
Phosphorus (P)-Dissolved			<0.05		mg/L		0.05	11-JAN-07
Potassium (K)-Dissolved			<1		mg/L		1	11-JAN-07
Selenium (se)-Dissolved			<0.005		mg/L		0.005	11-JAN-07
Silicon (Si)-Dissolved			<0.1		mg/L		0.1	11-JAN-07
Silver (Ag)-Dissolved			<0.0001		mg/L		0.0001	11-JAN-07
Sodium (Na)-Dissolved			<0.5		mg/L		0.5	11-JAN-07
Strontium (Sr)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Thallium (Tl)-Dissolved			<0.0003		mg/L		0.0003	11-JAN-07
Tin (Sn)-Dissolved			<0.001		mg/L		0.001	11-JAN-07

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-WT	Water							
Batch R482884								
WG546250-3 MB								
Titanium (Ti)-Dissolved			<0.002		mg/L		0.002	11-JAN-07
Tungsten (W)-Dissolved			<0.01		mg/L		0.01	11-JAN-07
Uranium (U)-Dissolved			<0.005		mg/L		0.005	11-JAN-07
Vanadium (V)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Zinc (Zn)-Dissolved			<0.003		mg/L		0.003	11-JAN-07
Zirconium (Zr)-Dissolved			<0.004		mg/L		0.004	11-JAN-07
Cadmium (Cd)-Dissolved			<0.0001		mg/L		0.0001	11-JAN-07
MET-TOT-WT	Water							
Batch R482884								
WG546250-1 CVS								
Aluminum (Al)-Total			102		%		77-128	11-JAN-07
Antimony (Sb)-Total			107		%		73-134	11-JAN-07
Arsenic (As)-Total			105		%		93-122	11-JAN-07
Barium (Ba)-Total			104		%		86-120	11-JAN-07
Beryllium (Be)-Total			97		%		85-124	11-JAN-07
Bismuth (Bi)-Total			109		%		76-114	11-JAN-07
Boron (B)-Total			104		%		67-131	11-JAN-07
Cadmium (Cd)-Total			106		%		83-122	11-JAN-07
Calcium (Ca)-Total			97		%		86-121	11-JAN-07
Chromium (Cr)-Total			109		%		89-121	11-JAN-07
Cobalt (Co)-Total			112		%		86-122	11-JAN-07
Copper (Cu)-Total			109		%		83-124	11-JAN-07
Iron (Fe)-Total			112		%		88-134	11-JAN-07
Lead (Pb)-Total			111		%		80-128	11-JAN-07
Magnesium (Mg)-Total			94		%		78-124	11-JAN-07
Manganese (Mn)-Total			106		%		76-124	11-JAN-07
Molybdenum (Mo)-Total			111		%		80-122	11-JAN-07
Nickel (Ni)-Total			110		%		90-121	11-JAN-07
Phosphorus (P)-Total			105		%		71-132	11-JAN-07
Potassium (K)-Total			100		%		70-146	11-JAN-07
Selenium (Se)-Total			99		%		79-132	11-JAN-07
Silver (Ag)-Total			109		%		80-120	11-JAN-07
Sodium (Na)-Total			97		%		79-123	11-JAN-07

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-WT	Water							
Batch R482884								
WG546250-1 CVS								
Strontium (Sr)-Total			98		%		82-118	11-JAN-07
Thallium (Tl)-Total			108		%		73-133	11-JAN-07
Uranium (U)-Total			106		%		79-123	11-JAN-07
Vanadium (V)-Total			103		%		75-123	11-JAN-07
Zinc (Zn)-Total			91		%		76-130	11-JAN-07
WG546250-2 CVS								
Silicon (Si)-Total			120		%		71-151	11-JAN-07
Tin (Sn)-Total			104		%		91-139	11-JAN-07
Titanium (Ti)-Total			110		%		81-125	11-JAN-07
Tungsten (W)-Total			110		%		71-131	11-JAN-07
Zirconium (Zr)-Total			105		%		74-130	11-JAN-07
WG546250-5 DUP		WG546250-4						
Aluminum (Al)-Total		<0.01	<0.01	RPD-NA	mg/L	N/A	20	11-JAN-07
Antimony (Sb)-Total		<0.005	<0.005	RPD-NA	mg/L	N/A	20	11-JAN-07
Arsenic (As)-Total		0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Barium (Ba)-Total		0.06	0.06	J	mg/L	0.00	0.04	11-JAN-07
Beryllium (Be)-Total		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Bismuth (Bi)-Total		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Boron (B)-Total		0.07	0.07	J	mg/L	0.00	0.2	11-JAN-07
Cadmium (Cd)-Total		0.0006	0.0005	J	mg/L	0.0000	0.0004	11-JAN-07
Calcium (Ca)-Total		84.5	84.1		mg/L	0.41	20	11-JAN-07
Chromium (Cr)-Total		0.002	0.002	J	mg/L	0.000	0.004	11-JAN-07
Cobalt (Co)-Total		0.0010	0.0010	J	mg/L	0.0000	0.002	11-JAN-07
Copper (Cu)-Total		0.001	0.001	J	mg/L	0.000	0.004	11-JAN-07
Iron (Fe)-Total		<0.05	<0.05	RPD-NA	mg/L	N/A	20	11-JAN-07
Lead (Pb)-Total		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Magnesium (Mg)-Total		30.0	29.9		mg/L	0.30	20	11-JAN-07
Manganese (Mn)-Total		0.128	0.128		mg/L	0.089	20	11-JAN-07
Molybdenum (Mo)-Total		0.012	0.013		mg/L	5.8	20	11-JAN-07
Nickel (Ni)-Total		0.004	0.004	J	mg/L	0.000	0.008	11-JAN-07
Phosphorus (P)-Total		<0.05	<0.05	RPD-NA	mg/L	N/A	20	11-JAN-07
Potassium (K)-Total		3	3	J	mg/L	0	4	11-JAN-07
Selenium (Se)-Total		0.017	0.017	J	mg/L	0.000	0.02	11-JAN-07

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-WT	Water							
Batch R482884								
WG546250-5 DUP		WG546250-4						
Silicon (Si)-Total		7.6	7.5		mg/L	0.99	20	11-JAN-07
Silver (Ag)-Total		<0.0001	<0.0001	RPD-NA	mg/L	N/A	20	11-JAN-07
Sodium (Na)-Total		<0.5	<0.5	RPD-NA	mg/L	N/A	20	11-JAN-07
Strontium (Sr)-Total		0.225	0.229		mg/L	1.9	20	11-JAN-07
Thallium (Tl)-Total		<0.0003	<0.0003	RPD-NA	mg/L	N/A	20	11-JAN-07
Tin (Sn)-Total		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Titanium (Ti)-Total		<0.002	<0.002	RPD-NA	mg/L	N/A	20	11-JAN-07
Tungsten (W)-Total		<0.01	<0.01	RPD-NA	mg/L	N/A	20	11-JAN-07
Uranium (U)-Total		<0.005	<0.005	RPD-NA	mg/L	N/A	20	11-JAN-07
Vanadium (V)-Total		0.003	0.003	J	mg/L	0.000	0.004	11-JAN-07
Zinc (Zn)-Total		0.016	0.016	J	mg/L	0.000	0.012	11-JAN-07
Zirconium (Zr)-Total		<0.004	<0.004	RPD-NA	mg/L	N/A	20	11-JAN-07
WG546250-3 MB								
Aluminum (Al)-Total			<0.01		mg/L		0.01	11-JAN-07
Antimony (Sb)-Total			<0.005		mg/L		0.005	11-JAN-07
Arsenic (As)-Total			<0.001		mg/L		0.001	11-JAN-07
Barium (Ba)-Total			<0.01		mg/L		0.01	11-JAN-07
Beryllium (Be)-Total			<0.001		mg/L		0.001	11-JAN-07
Bismuth (Bi)-Total			<0.001		mg/L		0.001	11-JAN-07
Boron (B)-Total			<0.05		mg/L		0.05	11-JAN-07
Calcium (Ca)-Total			<0.5		mg/L		0.5	11-JAN-07
Chromium (Cr)-Total			<0.001		mg/L		0.001	11-JAN-07
Cobalt (Co)-Total			<0.0005		mg/L		0.0005	11-JAN-07
Copper (Cu)-Total			<0.001		mg/L		0.001	11-JAN-07
Iron (Fe)-Total			<0.05		mg/L		0.05	11-JAN-07
Lead (Pb)-Total			<0.001		mg/L		0.001	11-JAN-07
Magnesium (Mg)-Total			<0.5		mg/L		0.5	11-JAN-07
Manganese (Mn)-Total			<0.001		mg/L		0.001	11-JAN-07
Molybdenum (Mo)-Total			<0.001		mg/L		0.001	11-JAN-07
Nickel (Ni)-Total			<0.002		mg/L		0.002	11-JAN-07
Phosphorus (P)-Total			<0.05		mg/L		0.05	11-JAN-07
Potassium (K)-Total			<1		mg/L		1	11-JAN-07
Selenium (Se)-Total			<0.005		mg/L		0.005	11-JAN-07

ALS Laboratory Group Quality Control Report

Workorder: L467510 Report Date: 27-FEB-07

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-WT	Water							
Batch R482884								
WG546250-3 MB								
Silicon (Si)-Total			<0.1		mg/L		0.1	11-JAN-07
Silver (Ag)-Total			<0.0001		mg/L		0.0001	11-JAN-07
Sodium (Na)-Total			<0.5		mg/L		0.5	11-JAN-07
Strontium (Sr)-Total			<0.001		mg/L		0.001	11-JAN-07
Thallium (Tl)-Total			<0.0003		mg/L		0.0003	11-JAN-07
Tin (Sn)-Total			<0.001		mg/L		0.001	11-JAN-07
Titanium (Ti)-Total			<0.002		mg/L		0.002	11-JAN-07
Tungsten (W)-Total			<0.01		mg/L		0.01	11-JAN-07
Uranium (U)-Total			<0.005		mg/L		0.005	11-JAN-07
Vanadium (V)-Total			<0.001		mg/L		0.001	11-JAN-07
Zinc (Zn)-Total			<0.003		mg/L		0.003	11-JAN-07
Zirconium (Zr)-Total			<0.004		mg/L		0.004	11-JAN-07
Cadmium (Cd)-Total			<0.0001		mg/L		0.0001	11-JAN-07
NH3-WT	Water							
Batch R481313								
WG544489-2 CVS								
Ammonia as N			101		%		85-115	05-JAN-07
WG544489-3 DUP		L467401-4						
Ammonia as N		<0.05	<0.05	RPD-NA	mg/L	N/A	20	05-JAN-07
WG544489-4 DUP		L467526-2						
Ammonia as N		0.05	0.06	J	mg/L	0.01	0.2	05-JAN-07
WG544489-1 MB								
Ammonia as N			<0.05		mg/L		0.05	05-JAN-07
PH-WT	Water							
Batch R482207								
WG545650-1 CVS								
pH			100		%		90-110	09-JAN-07
WG545650-3 DUP		L468000-1						
pH		7.88	7.88		pH units	0.0	20	09-JAN-07
WG545650-4 DUP		L468263-1						
pH		7.27	7.28		pH units	0.14	20	09-JAN-07
SOLIDS-TDS-WT	Water							

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-WT	**Water**							
Batch R482098								
WG545008-2 DUP		L467510-1						
Total Dissolved Solids		4360	4380		mg/L	0.55	30	09-JAN-07
WG545008-3 LCS								
Total Dissolved Solids			94		%		70-130	09-JAN-07
WG545008-1 MB								
Total Dissolved Solids			<20		mg/L		20	09-JAN-07
TURBIDITY-WT	**Water**							
Batch R481527								
WG544772-1 CVS								
Turbidity			95		%		78-116	06-JAN-07
WG544772-3 DUP		L467510-1						
Turbidity		2.9	3.0		NTU	3.4	20	06-JAN-07
WG544772-2 MB								
Turbidity			<0.1		NTU		0.1	06-JAN-07

ALS Laboratory Group Quality Control Report

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B	Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
E	Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F	Silver recovery low, likely due to elevated chloride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
J	Duplicate results and limit(s) are expressed in terms of absolute difference.
K	The sample referenced above is of a non-standard matrix type; standard QC acceptance criteria may not be achievable.
L	Low matrix spike recovery due to instability of spiked analyte in the sample matrix.

ALS Laboratory Group/ETL
29-309 Exeter Road
London ON N6L 1C1
519-652-6044

ETL

CANADA TOLL FREE: 1-800-668-9878

CHAIN OF CUSTODY / ANALYTICAL SERVICES REQUEST FORM

C of C # 30956
PAGE 1 OF 1

Service Requested:		Regular (default)
Date Required:		Priority (50% surcharge)
		Emergency (100% surcharge)

COMPANY NAME: Stantec
PROJECT MANAGER: RENDAS / Holtze
PROJECT #: 162704383
PHONE: 519 763-4412
FAX: 519 763-4419
QUOTATION #: Q14212 PO#:

CRITERIA: Criteria on report (y/n) ___
Reg 153/04
Table ___
TCLP ___ MISA ___ PWQO ___
OTHER ___

REPORT DISTRIBUTION: ALL FINAL RESULTS WILL BE MAILED
EMAIL ✓ FAX ___
EMAIL1 mrendas@stantec.com
EMAIL2 kholtze@stantec.com
SELECT: pdf ___ digital ___ both ___

SAMPLING INFORMATION

Sample Date/Time		TYPE		MATRIX				NUMBER OF CONTAINERS	ANALYSIS REQUEST										INDICATE BOTTLES FIELD FILTERED/ PRESERVED (F/P)		
Date (yy/mm/dd)	Time (24 hr)	COMP	GRAB	WATER	SOIL	OTHER	SAMPLE DESCRIPTION TO APPEAR ON REPORT		Metals Total	Metals Dissolved	TDS / Fluoride / Hydroxide	Ammonia Nitrate Nitrite Nitrogen	Bicarbonate / Carbonate	Organic Carbon	Sulphate	Total N	total Kjeldahl N	turbidity		COMMENTS	LAB ID
2007-01-04	13:00			✓			17673	6	X	X	X	X	X	X	X	X	X	X			-1
							X Do not combine CofC's														

SPECIAL INSTRUCTIONS/COMMENTS

SAMPLE CONDITION

	MEAN TEMP
FROZEN	
COLD	
AMBIENT	7°
CONDITION ACCEPTABLE UPON RECEIPT (Y/N) ___	INIT

SAMPLED BY:	DATE & TIME	RECEIVED BY:	DATE & TIME
JP	2007-01-04		
RELINQUISHED BY:	DATE & TIME	RECEIVED AT LAB BY:	DATE & TIME
		[illegible]	4-1-06 15:00

NOTES AND CONDITIONS:
1. Quote number must be provided to ensure proper pricing.
2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs.
3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section.

White - report copy YELLOW - File copy PINK - Customer Copy

APPENDIX A

STATION WRS-03

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

ANALYTICAL REPORT

STANTEC CONSULTING LTD
ATTN: KEITH HOLTZE/MARTINA RENDAS
Reported On: 16-JAN-07 03:44 PM

11B NICHOLAS BEAVER PARK ROAD

GUELPH ON N1H 6H9

Lab Work Order #: L467515 WRS-03 Date Received: 04-JAN-07

Project P.O. #: 162704383
Job Reference: 162704383
Legal Site Desc:
CofC Numbers:

Other Information:

Comments:

<original signed by>

APPROVED BY:

DARLENE HOOGENES-STASTNY
Project Manager

ETL Chemspec Analytical Ltd.
Part of the ALS Laboratory Group
309 Exeter Road Unit #29, London, ON N6L 1C1
Phone: +1 519 652 6044 Fax: +1 519 652 0671 www.alsglobal.com
A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	By	Batch
L467515-1 17672								
Sampled By: JP on 04-JAN-07 @ 15:00								
Matrix: WATER								
Ammonia as N	<0.05		0.05	mg/L	05-JAN-07	05-JAN-07	AF	R481313
Anion Scan (IC)								
Chloride	810		2	mg/L	08-JAN-07	08-JAN-07	KA	R481990
Bromide	0.5		0.1	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Fluoride	<0.1		0.1	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Nitrite-N	<0.5		0.5	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Nitrate-N	0.1		0.1	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Phosphate-P (ortho)	<0.3		0.3	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Sulphate	168		2	mg/L	05-JAN-07	05-JAN-07	KA	R481872
Dissolved Organic Carbon	5		1	mg/L	05-JAN-07	05-JAN-07	SARA	R481663
Hydroxide (OH)	<5		5	mg/L	08-JAN-07	08-JAN-07	JIC	R482060
Metal Scan-Dissolved								
Aluminum (Al)-Dissolved	<0.01		0.01	mg/L		11-JAN-07	JS	R482884
Antimony (Sb)-Dissolved	<0.005		0.005	mg/L		11-JAN-07	JS	R482884
Arsenic (As)-Dissolved	0.001		0.001	mg/L		11-JAN-07	JS	R482884
Barium (Ba)-Dissolved	0.33		0.01	mg/L		11-JAN-07	JS	R482884
Beryllium (Be)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Bismuth (Bi)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Boron (B)-Dissolved	0.70		0.05	mg/L		11-JAN-07	JS	R482884
Cadmium (Cd)-Dissolved	<0.0001		0.0001	mg/L		11-JAN-07	JS	R482884
Calcium (Ca)-Dissolved	116		0.5	mg/L		11-JAN-07	JS	R482884
Chromium (Cr)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Cobalt (Co)-Dissolved	<0.0005		0.0005	mg/L		11-JAN-07	JS	R482884
Copper (Cu)-Dissolved	0.001		0.001	mg/L		11-JAN-07	JS	R482884
Iron (Fe)-Dissolved	<0.05		0.05	mg/L		11-JAN-07	JS	R482884
Lead (Pb)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Magnesium (Mg)-Dissolved	21.3		0.5	mg/L		11-JAN-07	JS	R482884
Manganese (Mn)-Dissolved	0.259		0.001	mg/L		11-JAN-07	JS	R482884
Molybdenum (Mo)-Dissolved	0.002		0.001	mg/L		11-JAN-07	JS	R482884
Nickel (Ni)-Dissolved	0.005		0.002	mg/L		11-JAN-07	JS	R482884
Phosphorus (P)-Dissolved	<0.05		0.05	mg/L		11-JAN-07	JS	R482884
Potassium (K)-Dissolved	3		1	mg/L		11-JAN-07	JS	R482884
Selenium (se)-Dissolved	0.015		0.005	mg/L		11-JAN-07	JS	R482884
Silicon (Si)-Dissolved	7.6		0.1	mg/L		11-JAN-07	JS	R482884
Silver (Ag)-Dissolved	<0.0001		0.0001	mg/L		11-JAN-07	JS	R482884
Sodium (Na)-Dissolved	500		25	mg/L		11-JAN-07	JS	R482884
Strontium (Sr)-Dissolved	0.243		0.001	mg/L		11-JAN-07	JS	R482884
Thallium (Tl)-Dissolved	<0.0003		0.0003	mg/L		11-JAN-07	JS	R482884
Tin (Sn)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Titanium (Ti)-Dissolved	<0.002		0.002	mg/L		11-JAN-07	JS	R482884
Tungsten (W)-Dissolved	<0.01		0.01	mg/L		11-JAN-07	JS	R482884
Uranium (U)-Dissolved	<0.005		0.005	mg/L		11-JAN-07	JS	R482884
Vanadium (V)-Dissolved	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Zinc (Zn)-Dissolved	<0.003		0.003	mg/L		11-JAN-07	JS	R482884
Zirconium (Zr)-Dissolved	<0.004		0.004	mg/L		11-JAN-07	JS	R482884
Metal Scan-Total								
Aluminum (Al)-Total	0.04		0.01	mg/L		11-JAN-07	JS	R482884
Antimony (Sb)-Total	<0.005		0.005	mg/L		11-JAN-07	JS	R482884
Arsenic (As)-Total	0.002		0.001	mg/L		11-JAN-07	JS	R482884
Barium (Ba)-Total	0.34		0.01	mg/L		11-JAN-07	JS	R482884
Beryllium (Be)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	By	Batch
L467515-1 17672								
Sampled By: JP on 04-JAN-07 @ 15:00								
Matrix: WATER								
Metal Scan-Total								
Bismuth (Bi)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Boron (B)-Total	0.67		0.05	mg/L		11-JAN-07	JS	R482884
Cadmium (Cd)-Total	0.0001		0.0001	mg/L		11-JAN-07	JS	R482884
Calcium (Ca)-Total	114		0.5	mg/L		11-JAN-07	JS	R482884
Chromium (Cr)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Cobalt (Co)-Total	<0.0005		0.0005	mg/L		11-JAN-07	JS	R482884
Copper (Cu)-Total	0.001		0.001	mg/L		11-JAN-07	JS	R482884
Iron (Fe)-Total	0.73		0.05	mg/L		11-JAN-07	JS	R482884
Lead (Pb)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Magnesium (Mg)-Total	21.0		0.5	mg/L		11-JAN-07	JS	R482884
Manganese (Mn)-Total	0.294		0.001	mg/L		11-JAN-07	JS	R482884
Molybdenum (Mo)-Total	0.002		0.001	mg/L		11-JAN-07	JS	R482884
Nickel (Ni)-Total	0.005		0.002	mg/L		11-JAN-07	JS	R482884
Phosphorus (P)-Total	<0.05		0.05	mg/L		11-JAN-07	JS	R482884
Potassium (K)-Total	3		1	mg/L		11-JAN-07	JS	R482884
Selenium (Se)-Total	0.006		0.005	mg/L		11-JAN-07	JS	R482884
Silicon (Si)-Total	5.7		0.1	mg/L		11-JAN-07	JS	R482884
Silver (Ag)-Total	<0.0001		0.0001	mg/L		11-JAN-07	JS	R482884
Sodium (Na)-Total	500		25	mg/L		11-JAN-07	JS	R482884
Strontium (Sr)-Total	0.249		0.001	mg/L		11-JAN-07	JS	R482884
Thallium (Tl)-Total	<0.0003		0.0003	mg/L		11-JAN-07	JS	R482884
Tin (Sn)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Titanium (Ti)-Total	0.005		0.002	mg/L		11-JAN-07	JS	R482884
Tungsten (W)-Total	<0.01		0.01	mg/L		11-JAN-07	JS	R482884
Uranium (U)-Total	<0.005		0.005	mg/L		11-JAN-07	JS	R482884
Vanadium (V)-Total	<0.001		0.001	mg/L		11-JAN-07	JS	R482884
Zinc (Zn)-Total	<0.003		0.003	mg/L		11-JAN-07	JS	R482884
Zirconium (Zr)-Total	<0.004		0.004	mg/L		11-JAN-07	JS	R482884
Speciated Alkalinity								
Alkalinity, Total (as CaCO3)	250		10	mg/L	10-JAN-07	10-JAN-07	AF	R482382
Alkalinity, Bicarbonate (as CaCO3)	248		10	mg/L	10-JAN-07	10-JAN-07	AF	R482382
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L	10-JAN-07	10-JAN-07	AF	R482382
Total Dissolved Solids	1870		20	mg/L	08-JAN-07	09-JAN-07	SARA	R482098
Total Kjeldahl Nitrogen	0.3		0.15	mg/L	09-JAN-07	09-JAN-07	BJM	R482282
Turbidity	2.7		0.1	NTU	06-JAN-07	06-JAN-07	BZ	R481527
pH	7.93		0.01	pH units	09-JAN-07	09-JAN-07	BZ	R482207

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

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-WT	**Water**							
Batch R482884								
WG546250-2 CVS								
Silicon (Si)-Dissolved			120		%		61-151	11-JAN-07
Tin (Sn)-Dissolved			104		%		91-139	11-JAN-07
Titanium (Ti)-Dissolved			110		%		87-120	11-JAN-07
Tungsten (W)-Dissolved			110		%		74-132	11-JAN-07
Zirconium (Zr)-Dissolved			105		%		77-128	11-JAN-07
WG546250-5 DUP		**WG546250-4**						
Aluminum (Al)-Dissolved		<0.01	<0.01	RPD-NA	mg/L	N/A	20	11-JAN-07
Antimony (Sb)-Dissolved		<0.005	<0.005	RPD-NA	mg/L	N/A	20	11-JAN-07
Arsenic (As)-Dissolved		0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Barium (Ba)-Dissolved		0.06	0.06	J	mg/L	0.00	0.04	11-JAN-07
Beryllium (Be)-Dissolved		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Bismuth (Bi)-Dissolved		<0.001	<0.001	RPD-NA	mg/L	N/A	26	11-JAN-07
Boron (B)-Dissolved		0.07	0.07	J	mg/L	0.00	0.2	11-JAN-07
Cadmium (Cd)-Dissolved		0.0006	0.0005	J	mg/L	0.0000	0.0004	11-JAN-07
Calcium (Ca)-Dissolved		84.5	84.1		mg/L	0.41	20	11-JAN-07
Chromium (Cr)-Dissolved		0.002	0.002	J	mg/L	0.000	0.004	11-JAN-07
Cobalt (Co)-Dissolved		0.0010	0.0010	J	mg/L	0.0000	0.002	11-JAN-07
Copper (Cu)-Dissolved		0.001	0.001	J	mg/L	0.000	0.004	11-JAN-07
Iron (Fe)-Dissolved		<0.05	<0.05	RPD-NA	mg/L	N/A	20	11-JAN-07
Lead (Pb)-Dissolved		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Magnesium (Mg)-Dissolved		30.0	29.9		mg/L	0.30	20	11-JAN-07
Manganese (Mn)-Dissolved		0.128	0.128		mg/L	0.089	20	11-JAN-07
Molybdenum (Mo)-Dissolved		0.012	0.013		mg/L	5.8	20	11-JAN-07
Nickel (Ni)-Dissolved		0.004	0.004	J	mg/L	0.000	0.008	11-JAN-07
Phosphorus (P)-Dissolved		<0.05	<0.05	RPD-NA	mg/L	N/A	20	11-JAN-07
Potassium (K)-Dissolved		3	3	J	mg/L	0	4	11-JAN-07
Selenium (se)-Dissolved		0.017	0.017	J	mg/L	0.000	0.02	11-JAN-07
Silicon (Si)-Dissolved		7.6	7.5		mg/L	0.99	20	11-JAN-07
Silver (Ag)-Dissolved		<0.0001	<0.0001	RPD-NA	mg/L	N/A	33	11-JAN-07
Sodium (Na)-Dissolved		<0.5	<0.5	RPD-NA	mg/L	N/A	20	11-JAN-07
Strontium (Sr)-Dissolved		0.225	0.229		mg/L	1.9	20	11-JAN-07
Thallium (Tl)-Dissolved		<0.0003	<0.0003	RPD-NA	mg/L	N/A	20	11-JAN-07
Tin (Sn)-Dissolved		<0.001	<0.001	RPD-NA	mg/L	N/A	26	11-JAN-07

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
ALK-SPEC-WT	Water	Speciated Alkalinity		APHA 2320B
ANIONS-WT	Water	Anion Scan (IC)		EPA 300.0 (IC)
C-DIS-ORG-WT	Water	Dissolved Organic Carbon		APHA 5310 B-Instrumental
MET-DIS-WT	Water	Metal Scan-Dissolved		EPA 200.8
MET-TOT-WT	Water	Metal Scan-Total		EPA 200.8
NH3-WT	Water	Ammonia as N		APHA 4500-NH3
OH-TB	Water	Hydroxide		APHA 2320 B-Potentiometric Titration
PH-WT	Water	pH		APHA 4500 H-Electrode
SOLIDS-TDS-WT	Water	Total Dissolved Solids		APHA 2540C
TKN-WT	Water	Total Kjeldahl Nitrogen		APHA 4500-N
TURBIDITY-WT	Water	Turbidity		APHA 2130 B

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

Chain of Custody numbers:

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

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
TB	ALS LABORATORY GROUP - THUNDER BAY, ONTARIO, CANADA	WT	ALS LABORATORY GROUP - WATERLOO (SENTINEL), ONTARIO, CAN

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

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

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

ALS Laboratory Group Quality Control Report

Workorder: L467515 Report Date: 16-JAN-07

Client: STANTEC CONSULTING LTD
11B NICHOLAS BEAVER PARK ROAD
GUELPH ON N1H 6H9

Contact: KEITH HOLTZE/MARTINA RENDAS

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-SPEC-WT	**Water**							
Batch R482382								
WG545388-2 CVS								
Alkalinity, Total (as CaCO3)			97		%		80-120	10-JAN-07
WG545388-3 DUP		**L467441-1**						
Alkalinity, Bicarbonate (as CaCO3)		185	176		mg/L	5.4	25	10-JAN-07
Alkalinity, Carbonate (as CaCO3)		<10	<10	RPD-NA	mg/L	N/A	25	10-JAN-07
Alkalinity, Total (as CaCO3)		190	180		mg/L	5.4	25	10-JAN-07
WG545388-1 MB								
Alkalinity, Bicarbonate (as CaCO3)			<10		mg/L		10	10-JAN-07
Alkalinity, Carbonate (as CaCO3)			<10		mg/L		10	10-JAN-07
Alkalinity, Total (as CaCO3)			<10		mg/L		10	10-JAN-07
ANIONS-WT	**Water**							
Batch R481872								
WG544507-9 DUP		**WG544507-4**						
Bromide		1.0	1.0		mg/L	2.0	25	05-JAN-07
Chloride		20	20	J	mg/L	0	8	05-JAN-07
Fluoride		1.0	1.0	J	mg/L	0.0	0.4	05-JAN-07
Nitrate-N		0.9	0.9	J	mg/L	0.0	0.4	05-JAN-07
Nitrite-N		0.9	0.9	J	mg/L	0.0	0.4	05-JAN-07
Phosphate-P (ortho)		0.9	0.9	J	mg/L	0.0	1.2	05-JAN-07
Sulphate		20	20	J	mg/L	0	8	05-JAN-07
WG544507-3 LCS								
Bromide			102		%		80-120	05-JAN-07
Chloride			96		%		80-120	05-JAN-07
Fluoride			97		%		75-125	05-JAN-07
Nitrate-N			100		%		80-120	05-JAN-07
Nitrite-N			99		%		80-120	05-JAN-07
Phosphate-P (ortho)			91		%		63-138	05-JAN-07
Sulphate			97		%		80-120	05-JAN-07
WG544507-1 MB								
Bromide			<0.1		mg/L		0.1	05-JAN-07
Chloride			<2		mg/L		2	05-JAN-07
Fluoride			<0.1		mg/L		0.1	05-JAN-07
Nitrate-N			<0.1		mg/L		0.1	05-JAN-07
Nitrite-N			<0.1		mg/L		0.1	05-JAN-07
Phosphate-P (ortho)			<0.3		mg/L		0.3	05-JAN-07

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ANIONS-WT	**Water**							
Batch R481872								
WG544507-1 MB								
Sulphate			<2		mg/L		2	05-JAN-07
Batch R481990								
WG545110-6 DUP		**WG545110-4**						
Bromide		1.0	1.0	J	mg/L	0.0	0.4	08-JAN-07
Chloride		19	19	J	mg/L	0	8	08-JAN-07
Fluoride		1.0	1.0		mg/L	0.0	20	08-JAN-07
Nitrate-N		0.9	0.9	J	mg/L	0.0	0.4	08-JAN-07
Nitrite-N		0.9	0.9	J	mg/L	0.0	0.4	08-JAN-07
Sulphate		20	20	J	mg/L	0	8	08-JAN-07
WG545110-3 LCS								
Bromide			100		%		80-120	08-JAN-07
Chloride			95		%		80-120	08-JAN-07
Fluoride			97		%		75-125	08-JAN-07
Nitrate-N			98		%		80-120	08-JAN-07
Nitrite-N			100		%		80-120	08-JAN-07
Sulphate			95		%		80-120	08-JAN-07
WG545110-1 MB								
Bromide			<0.1		mg/L		0.1	08-JAN-07
Chloride			<2		mg/L		2	08-JAN-07
Fluoride			<0.1		mg/L		0.1	08-JAN-07
Nitrate-N			<0.1		mg/L		0.1	08-JAN-07
Nitrite-N			<0.1		mg/L		0.1	08-JAN-07
Sulphate			<2		mg/L		2	08-JAN-07
C-DIS-ORG-WT	**Water**							
Batch R481663								
WG544294-2 DUP		**L467086-1**						
Dissolved Organic Carbon		2	3	J	mg/L	0	4	05-JAN-07
WG544294-3 LCS								
Dissolved Organic Carbon			98		%		77-120	05-JAN-07
WG544294-1 MB								
Dissolved Organic Carbon			<1		mg/L		1	05-JAN-07
WG544294-4 MS		**L467086-2**						
Dissolved Organic Carbon			103		%		60-140	05-JAN-07
WG544294-5 MSD		**WG544294-4**						

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DIS-ORG-WT	Water							
Batch R481663								
WG544294-5 MSD		WG544294-4						
Dissolved Organic Carbon		103	98		%	4.4	26	05-JAN-07
MET-DIS-WT	Water							
Batch R482884								
WG546250-1 CVS								
Aluminum (Al)-Dissolved			102		%		78-129	11-JAN-07
Antimony (Sb)-Dissolved			107		%		72-130	11-JAN-07
Arsenic (As)-Dissolved			105		%		89-123	11-JAN-07
Barium (Ba)-Dissolved			104		%		82-124	11-JAN-07
Beryllium (Be)-Dissolved			97		%		84-125	11-JAN-07
Bismuth (Bi)-Dissolved			109		%		77-115	11-JAN-07
Boron (B)-Dissolved			104		%		69-129	11-JAN-07
Cadmium (Cd)-Dissolved			106		%		83-124	11-JAN-07
Calcium (Ca)-Dissolved			97		%		84-121	11-JAN-07
Chromium (Cr)-Dissolved			109		%		88-121	11-JAN-07
Cobalt (Co)-Dissolved			112		%		87-118	11-JAN-07
Copper (Cu)-Dissolved			109		%		82-124	11-JAN-07
Iron (Fe)-Dissolved			112		%		88-134	11-JAN-07
Lead (Pb)-Dissolved			111		%		80-128	11-JAN-07
Magnesium (Mg)-Dissolved			94		%		80-125	11-JAN-07
Manganese (Mn)-Dissolved			106		%		84-122	11-JAN-07
Molybdenum (Mo)-Dissolved			111		%		79-122	11-JAN-07
Nickel (Ni)-Dissolved			110		%		88-120	11-JAN-07
Phosphorus (P)-Dissolved			105		%		76-127	11-JAN-07
Potassium (K)-Dissolved			100		%		74-143	11-JAN-07
Selenium (se)-Dissolved			99		%		83-129	11-JAN-07
Silver (Ag)-Dissolved			109		%		81-121	11-JAN-07
Sodium (Na)-Dissolved			97		%		86-123	11-JAN-07
Strontium (Sr)-Dissolved			98		%		89-117	11-JAN-07
Thallium (Tl)-Dissolved			108		%		78-128	11-JAN-07
Uranium (U)-Dissolved			106		%		82-123	11-JAN-07
Vanadium (V)-Dissolved			103		%		77-123	11-JAN-07
Zinc (Zn)-Dissolved			91		%		86-126	11-JAN-07

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-WT	**Water**							
Batch R482884								
WG546250-5 DUP		**WG546250-4**						
Titanium (Ti)-Dissolved		<0.002	<0.002	RPD-NA	mg/L	N/A	20	11-JAN-07
Tungsten (W)-Dissolved		<0.01	<0.01	RPD-NA	mg/L	N/A	20	11-JAN-07
Uranium (U)-Dissolved		<0.005	<0.005	RPD-NA	mg/L	N/A	20	11-JAN-07
Vanadium (V)-Dissolved		0.003	0.003	J	mg/L	0.000	0.004	11-JAN-07
Zinc (Zn)-Dissolved		0.016	0.016	J	mg/L	0.000	0.012	11-JAN-07
Zirconium (Zr)-Dissolved		<0.004	<0.004	RPD-NA	mg/L	N/A	20	11-JAN-07
WG546250-3 MB								
Aluminum (Al)-Dissolved			<0.01		mg/L		0.01	11-JAN-07
Antimony (Sb)-Dissolved			<0.005		mg/L		0.005	11-JAN-07
Arsenic (As)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Barium (Ba)-Dissolved			<0.01		mg/L		0.01	11-JAN-07
Beryllium (Be)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Bismuth (Bi)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Boron (B)-Dissolved			<0.05		mg/L		0.05	11-JAN-07
Calcium (Ca)-Dissolved			<0.5		mg/L		0.5	11-JAN-07
Chromium (Cr)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Cobalt (Co)-Dissolved			<0.0005		mg/L		0.0005	11-JAN-07
Copper (Cu)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Iron (Fe)-Dissolved			<0.05		mg/L		0.05	11-JAN-07
Lead (Pb)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Magnesium (Mg)-Dissolved			<0.5		mg/L		0.5	11-JAN-07
Manganese (Mn)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Molybdenum (Mo)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Nickel (Ni)-Dissolved			<0.002		mg/L		0.002	11-JAN-07
Phosphorus (P)-Dissolved			<0.05		mg/L		0.05	11-JAN-07
Potassium (K)-Dissolved			<1		mg/L		1	11-JAN-07
Selenium (se)-Dissolved			<0.005		mg/L		0.005	11-JAN-07
Silicon (Si)-Dissolved			<0.1		mg/L		0.1	11-JAN-07
Silver (Ag)-Dissolved			<0.0001		mg/L		0.0001	11-JAN-07
Sodium (Na)-Dissolved			<0.5		mg/L		0.5	11-JAN-07
Strontium (Sr)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Thallium (Tl)-Dissolved			<0.0003		mg/L		0.0003	11-JAN-07
Tin (Sn)-Dissolved			<0.001		mg/L		0.001	11-JAN-07

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-WT	**Water**							
Batch R482884								
WG546250-3 MB								
Titanium (Ti)-Dissolved			<0.002		mg/L		0.002	11-JAN-07
Tungsten (W)-Dissolved			<0.01		mg/L		0.01	11-JAN-07
Uranium (U)-Dissolved			<0.005		mg/L		0.005	11-JAN-07
Vanadium (V)-Dissolved			<0.001		mg/L		0.001	11-JAN-07
Zinc (Zn)-Dissolved			<0.003		mg/L		0.003	11-JAN-07
Zirconium (Zr)-Dissolved			<0.004		mg/L		0.004	11-JAN-07
Cadmium (Cd)-Dissolved			<0.0001		mg/L		0.0001	11-JAN-07
MET-TOT-WT	**Water**							
Batch R482884								
WG546250-1 CVS								
Aluminum (Al)-Total			102		%		77-128	11-JAN-07
Antimony (Sb)-Total			107		%		73-134	11-JAN-07
Arsenic (As)-Total			105		%		93-122	11-JAN-07
Barium (Ba)-Total			104		%		86-120	11-JAN-07
Beryllium (Be)-Total			97		%		85-124	11-JAN-07
Bismuth (Bi)-Total			109		%		76-114	11-JAN-07
Boron (B)-Total			104		%		67-131	11-JAN-07
Cadmium (Cd)-Total			106		%		83-122	11-JAN-07
Calcium (Ca)-Total			97		%		86-121	11-JAN-07
Chromium (Cr)-Total			109		%		89-121	11-JAN-07
Cobalt (Co)-Total			112		%		86-122	11-JAN-07
Copper (Cu)-Total			109		%		83-124	11-JAN-07
Iron (Fe)-Total			112		%		88-134	11-JAN-07
Lead (Pb)-Total			111		%		80-128	11-JAN-07
Magnesium (Mg)-Total			94		%		78-124	11-JAN-07
Manganese (Mn)-Total			106		%		76-124	11-JAN-07
Molybdenum (Mo)-Total			111		%		80-122	11-JAN-07
Nickel (Ni)-Total			110		%		90-121	11-JAN-07
Phosphorus (P)-Total			105		%		71-132	11-JAN-07
Potassium (K)-Total			100		%		70-146	11-JAN-07
Selenium (Se)-Total			99		%		79-132	11-JAN-07
Silver (Ag)-Total			109		%		80-120	11-JAN-07
Sodium (Na)-Total			97		%		79-123	11-JAN-07

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-WT	**Water**							
Batch R482884								
WG546250-1 CVS								
Strontium (Sr)-Total			98		%		82-118	11-JAN-07
Thallium (Tl)-Total			108		%		73-133	11-JAN-07
Uranium (U)-Total			106		%		79-123	11-JAN-07
Vanadium (V)-Total			103		%		75-123	11-JAN-07
Zinc (Zn)-Total			91		%		76-130	11-JAN-07
WG546250-2 CVS								
Silicon (Si)-Total			120		%		71-151	11-JAN-07
Tin (Sn)-Total			104		%		91-139	11-JAN-07
Titanium (Ti)-Total			110		%		81-125	11-JAN-07
Tungsten (W)-Total			110		%		71-131	11-JAN-07
Zirconium (Zr)-Total			105		%		74-130	11-JAN-07
WG546250-5 DUP		**WG546250-4**						
Aluminum (Al)-Total		<0.01	<0.01	RPD-NA	mg/L	N/A	20	11-JAN-07
Antimony (Sb)-Total		<0.005	<0.005	RPD-NA	mg/L	N/A	20	11-JAN-07
Arsenic (As)-Total		0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Barium (Ba)-Total		0.06	0.06	J	mg/L	0.00	0.04	11-JAN-07
Beryllium (Be)-Total		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Bismuth (Bi)-Total		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Boron (B)-Total		0.07	0.07	J	mg/L	0.00	0.2	11-JAN-07
Cadmium (Cd)-Total		0.0006	0.0005	J	mg/L	0.0000	0.0004	11-JAN-07
Calcium (Ca)-Total		84.5	84.1		mg/L	0.41	20	11-JAN-07
Chromium (Cr)-Total		0.002	0.002	J	mg/L	0.000	0.004	11-JAN-07
Cobalt (Co)-Total		0.0010	0.0010	J	mg/L	0.0000	0.002	11-JAN-07
Copper (Cu)-Total		0.001	0.001	J	mg/L	0.000	0.004	11-JAN-07
Iron (Fe)-Total		<0.05	<0.05	RPD-NA	mg/L	N/A	20	11-JAN-07
Lead (Pb)-Total		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Magnesium (Mg)-Total		30.0	29.9		mg/L	0.30	20	11-JAN-07
Manganese (Mn)-Total		0.128	0.128		mg/L	0.089	20	11-JAN-07
Molybdenum (Mo)-Total		0.012	0.013		mg/L	5.8	20	11-JAN-07
Nickel (Ni)-Total		0.004	0.004	J	mg/L	0.000	0.008	11-JAN-07
Phosphorus (P)-Total		<0.05	<0.05	RPD-NA	mg/L	N/A	20	11-JAN-07
Potassium (K)-Total		3	3	J	mg/L	0	4	11-JAN-07
Selenium (Se)-Total		0.017	0.017	J	mg/L	0.000	0.02	11-JAN-07

ALS Laboratory Group Quality Control Report

Workorder: L467515 Report Date: 16-JAN-07

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-WT	**Water**							
Batch R482884								
WG546250-5 DUP		**WG546250-4**						
Silicon (Si)-Total		7.6	7.5		mg/L	0.99	20	11-JAN-07
Silver (Ag)-Total		<0.0001	<0.0001	RPD-NA	mg/L	N/A	20	11-JAN-07
Sodium (Na)-Total		<0.5	<0.5	RPD-NA	mg/L	N/A	20	11-JAN-07
Strontium (Sr)-Total		0.225	0.229		mg/L	1.9	20	11-JAN-07
Thallium (Tl)-Total		<0.0003	<0.0003	RPD-NA	mg/L	N/A	20	11-JAN-07
Tin (Sn)-Total		<0.001	<0.001	RPD-NA	mg/L	N/A	20	11-JAN-07
Titanium (Ti)-Total		<0.002	<0.002	RPD-NA	mg/L	N/A	20	11-JAN-07
Tungsten (W)-Total		<0.01	<0.01	RPD-NA	mg/L	N/A	20	11-JAN-07
Uranium (U)-Total		<0.005	<0.005	RPD-NA	mg/L	N/A	20	11-JAN-07
Vanadium (V)-Total		0.003	0.003	J	mg/L	0.000	0.004	11-JAN-07
Zinc (Zn)-Total		0.016	0.016	J	mg/L	0.000	0.012	11-JAN-07
Zirconium (Zr)-Total		<0.004	<0.004	RPD-NA	mg/L	N/A	20	11-JAN-07
WG546250-3 MB								
Aluminum (Al)-Total			<0.01		mg/L		0.01	11-JAN-07
Antimony (Sb)-Total			<0.005		mg/L		0.005	11-JAN-07
Arsenic (As)-Total			<0.001		mg/L		0.001	11-JAN-07
Barium (Ba)-Total			<0.01		mg/L		0.01	11-JAN-07
Beryllium (Be)-Total			<0.001		mg/L		0.001	11-JAN-07
Bismuth (Bi)-Total			<0.001		mg/L		0.001	11-JAN-07
Boron (B)-Total			<0.05		mg/L		0.05	11-JAN-07
Calcium (Ca)-Total			<0.5		mg/L		0.5	11-JAN-07
Chromium (Cr)-Total			<0.001		mg/L		0.001	11-JAN-07
Cobalt (Co)-Total			<0.0005		mg/L		0.0005	11-JAN-07
Copper (Cu)-Total			<0.001		mg/L		0.001	11-JAN-07
Iron (Fe)-Total			<0.05		mg/L		0.05	11-JAN-07
Lead (Pb)-Total			<0.001		mg/L		0.001	11-JAN-07
Magnesium (Mg)-Total			<0.5		mg/L		0.5	11-JAN-07
Manganese (Mn)-Total			<0.001		mg/L		0.001	11-JAN-07
Molybdenum (Mo)-Total			<0.001		mg/L		0.001	11-JAN-07
Nickel (Ni)-Total			<0.002		mg/L		0.002	11-JAN-07
Phosphorus (P)-Total			<0.05		mg/L		0.05	11-JAN-07
Potassium (K)-Total			<1		mg/L		1	11-JAN-07
Selenium (Se)-Total			<0.005		mg/L		0.005	11-JAN-07

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-WT	Water							
Batch R482884								
WG546250-3 MB								
Silicon (Si)-Total			<0.1		mg/L		0.1	11-JAN-07
Silver (Ag)-Total			<0.0001		mg/L		0.0001	11-JAN-07
Sodium (Na)-Total			<0.5		mg/L		0.5	11-JAN-07
Strontium (Sr)-Total			<0.001		mg/L		0.001	11-JAN-07
Thallium (Tl)-Total			<0.0003		mg/L		0.0003	11-JAN-07
Tin (Sn)-Total			<0.001		mg/L		0.001	11-JAN-07
Titanium (Ti)-Total			<0.002		mg/L		0.002	11-JAN-07
Tungsten (W)-Total			<0.01		mg/L		0.01	11-JAN-07
Uranium (U)-Total			<0.005		mg/L		0.005	11-JAN-07
Vanadium (V)-Total			<0.001		mg/L		0.001	11-JAN-07
Zinc (Zn)-Total			<0.003		mg/L		0.003	11-JAN-07
Zirconium (Zr)-Total			<0.004		mg/L		0.004	11-JAN-07
Cadmium (Cd)-Total			<0.0001		mg/L		0.0001	11-JAN-07
NH3-WT	Water							
Batch R481313								
WG544489-2 CVS								
Ammonia as N			101		%		85-115	05-JAN-07
WG544489-3 DUP		L467401-4						
Ammonia as N		<0.05	<0.05	RPD-NA	mg/L	N/A	20	05-JAN-07
WG544489-4 DUP		L467526-2						
Ammonia as N		0.05	0.06	J	mg/L	0.01	0.2	05-JAN-07
WG544489-1 MB								
Ammonia as N			<0.05		mg/L		0.05	05-JAN-07
PH-WT	Water							
Batch R482207								
WG545650-1 CVS								
pH			100		%		90-110	09-JAN-07
WG545650-3 DUP		L468000-1						
pH		7.88	7.88		pH units	0.0	20	09-JAN-07
WG545650-4 DUP		L468263-1						
pH		7.27	7.28		pH units	0.14	20	09-JAN-07
SOLIDS-TDS-WT	Water							

ALS Laboratory Group Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-WT	Water							
Batch R482098								
WG545008-2 DUP		L467510-1						
Total Dissolved Solids		4360	4380		mg/L	0.55	30	09-JAN-07
WG545008-3 LCS								
Total Dissolved Solids			94		%		70-130	09-JAN-07
WG545008-1 MB								
Total Dissolved Solids			<20		mg/L		20	09-JAN-07
TKN-WT	Water							
Batch R482282								
WG545404-2 CVS								
Total Kjeldahl Nitrogen			96		%		82-124	09-JAN-07
WG545404-3 DUP		L467702-1						
Total Kjeldahl Nitrogen		1.0	1.0	J	mg/L	0.0	0.6	09-JAN-07
WG545404-1 MB								
Total Kjeldahl Nitrogen			<0.2		mg/L		0.15	09-JAN-07
TURBIDITY-WT	Water							
Batch R481527								
WG544772-1 CVS								
Turbidity			95		%		78-116	06-JAN-07
WG544772-3 DUP		L467510-1						
Turbidity		2.9	3.0		NTU	3.4	20	06-JAN-07
WG544772-2 MB								
Turbidity			<0.1		NTU		0.1	06-JAN-07

ALS Laboratory Group Quality Control Report

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B	Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
E	Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F	Silver recovery low, likely due to elevated chloride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
J	Duplicate results and limit(s) are expressed in terms of absolute difference.
K	The sample referenced above is of a non-standard matrix type; standard QC acceptance criteria may not be achievable.
L	Low matrix spike recovery due to instability of spiked analyte in the sample matrix.

ALS Laboratory Group/ETL
29-309 Exeter Road
London ON N6L 1C1
519-652-6044

CANADA TOLL FREE: 1-800-668-9878

CHAIN OF CUSTODY / ANALYTICAL SERVICES REQUEST FORM

C of C # 30957
PAGE 1 OF 1

Service Requested: Regular (default) / Priority (50% surcharge) / Emergency (100% surcharge)
Date Required:

COMPANY NAME: Stantec
PROJECT MANAGER: RENDAS / Holtze
PROJECT #: 162704383
PHONE: 519 763-4412
FAX: 519 763-4419
QUOTATION #: Q14212
PO#:

CRITERIA: Criteria on report (y/n)
Reg 153/04
Table
TCLP ____ MISA ____ PWQO ____
OTHER
REPORT DISTRIBUTION: ALL FINAL RESULTS WILL BE MAILED
EMAIL ✓ FAX
EMAIL 1: mrendas@Stantec.com
EMAIL 2: Kholtze@Stantec.com
SELECT: pdf digital both ✓

SAMPLING INFORMATION

Sample Date/Time		TYPE		MATRIX			SAMPLE DESCRIPTION TO APPEAR ON REPORT	NUMBER OF CONTAINERS	ANALYSIS REQUEST										INDICATE BOTTLES FIELD FILTERED / PRESERVED (F/P)	COMMENTS	LAB ID
Date (yy/mm/dd)	Time (24 hr)	COMP	GRAB	WATER	SOIL	OTHER			Metals - Total	Metals - Dissolved	DS / Fluoride	Ammonia / Nitrate / Nitrite	Bicarbonate / Carbonate	Organic Carbon	Sulphate	total N	total Kjeldahl N	turbidity			
2007-01-04	13:00			✓			17672	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			-1

*DO NOT combine COfC's

SPECIAL INSTRUCTIONS/COMMENTS

SAMPLE CONDITION: FROZEN / COLD / AMBIENT — MEAN TEMP 7.0
CONDITION ACCEPTABLE UPON RECEIPT (Y/N) ____ — INIT KD

SAMPLED BY:	DATE & TIME	RECEIVED BY:	DATE & TIME
JP	2007-01-04		
RELINQUISHED BY:	DATE & TIME	RECEIVED AT LAB BY:	DATE & TIME
		KF	4-1-07 15:00

NOTES AND CONDITIONS:
1. Quote number must be provided to ensure proper pricing.
2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs.
3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section.

White - report copy YELLOW - File copy PINK - Customer Copy

APPENDIX B

ACUTE TOXICITY TEST RESULTS FROM STATIONS MWS-01 AND WRS-03, JANUARY 2007

APPENDIX B

STATION MWS-01

Stantec Consulting Ltd.
118 Nicholas Beaver Road RR3
Guelph ON N1H 6H9
Tel: (519) 763-4412 Fax: (519) 763-4419

stantec.com

TOXICITY TEST REPORT
Daphnia magna

Stantec

Work Order : 210742
Sample Number : 17673

MWS-01

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services	Time Collected :	11:30
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	MWS01	Date Received :	2007-01-04
Sampling Method :	Composite	Date Tested :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Temp. on arrival :	12.0° C
Sample Description:	Cloudy, grey, odourless.		

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*. Environment Canada EPS 1/RM/14 (Second Edition, December 2000).

TEST RESULTS

Effect	Value	95% Confidence Limits	Slope	Calculation Method
48-h LC50	>100%	-	-	-

The results reported relate only to the sample tested.

SODIUM CHLORIDE REFERENCE TOXICANT DATA

Organism Batch :	Dm06-26		
Date Tested (y/m/d) :	2007-01-03	Historical Mean LC50 :	6.5 g/L
LC50 (95% Confidence Limits) :	7.0 g/L (5.8 - 8.0)	Warning Limits (± 2SD) :	5.6 - 7.5 g/L
Statistical Method :	Non-Linear Interpolation	Analyst(s) :	JP

Daphnia magna CULTURE HEALTH DATA

Time to First Brood :	9.2 days	Mean Young Per Brood :	38.2
Culture Mortality :	1.8 % (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	4
pH Adjustment :	None	Test Organisms / Replicate :	3
Test Aeration :	None	Total Organisms / Test Level :	12
Organism Batch :	Dm06-26	Organism Loading Rate :	16.7 mL/organism

Date: 2007-01-11

<original signed by>

Approved by: Project Manager

Certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL)

Stantec

Daphnia magna TOXICITY TEST REPORT

Work Order: 210742
Sample Number: 17673

	Hardness (mg/L as $CaCO_3$)	Hardness Adjustment	pH	D.O. (mg/L)	Cond. (µs)	Temp. (°C)	O_2 Sat. (%)*	Total Pre-Aeration Time (h) @ 30 mL/min/L
Initial Water Chemistry:	160	None	9.0	9.8	7580	19.5	113	0:30

0 hours

Date & Time 2007-01-04 14:55
Technician: JP/SM

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O_2 Sat. (%)*	Hardness
100	0	0	8.9	9.7	7620	20.0	112	160
50	0	0	8.8	9.2	4230	19.5		
25	0	0	8.7	9.2	2373	19.5		
13	0	0	8.6	9.1	1420	19.5		
6	0	0	8.5	9.0	880	19.5		
Control	0	0	8.5	9.0	396	19.5	102	200

Notes:

24 hours

Date & Time 2007-01-05 14:55
Technician: JP

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	20.0
50	0	0	–	–	–	20.0
25	0	0	–	–	–	20.0
13	0	0	–	–	–	20.0
6	0	0	–	–	–	20.0
Control	0	0	–	–	–	20.0

Notes: Test organisms floating in the 100% effluent. (JP)

48 hours

Date & Time 2007-01-06 14:55
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	8.8	7.2	7640	20.0
50	0	0	8.6	8.6	4030	20.0
25	0	0	8.5	8.8	2070	20.0
13	0	0	8.5	8.8	1301	20.0
6	0	0	8.5	9.1	859	20.0
Control	0	0	8.5	9.0	398	20.0

Notes:

# of control organisms showing stress: 0
Daphnia Batch #: Dm06-26

Number immobile does not include number of mortalities.

– = not measured
* adjusted for actual temp. & barometric pressure

Test Data Reviewed By: JP
Date: 2007-01-08

Stantec Consulting Ltd.
11B Nicholas Beaver Road, RR3
Guelph ON N1H 6H9
Tel: (519) 763-4412 Fax: (519) 763-4419
stantec.com

TOXICITY TEST REPORT
Rainbow Trout

Stantec

Work Order : 210742
Sample Number : 17673

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services	Time Collected :	11:30
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	MWS01	Date Received :	2007-01-04
Sampling Method :	Composite	Date Tested :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Temp. on arrival :	12.0 °C
Sample Description :	Cloudy, grey, odourless.		

Test Method : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (Second Edition, December 2000).

TEST RESULTS

Effect	Value	95% Confidence Limits	Slope	Calculation Method
96-h LC50	>100%	-	-	-

The results reported relate only to the sample tested.

POTASSIUM CHLORIDE REFERENCE TOXICANT DATA

Organism Batch :	T06-20		
Date Tested (y/m/d) :	2007-01-02	Historical Mean LC50 :	3849 mg/L
LC50 (95% Confidence Limits) :	3815 mg/L (3370 - 4274)	Warning Limits (± 2SD) :	3152 - 4706 mg/L
Statistical Method :	Probit	Analyst(s) :	CT/FS/JGG

TEST FISH

Control Fish Sample Size :	10	Cumulative stock tank mortality :	0 % (prev. 7 days)
Mean Fish Weight (± 2 SD) :	0.35 ± 0.23 g	Mean Fish Fork Length (± 2 SD) :	35.3 ± 4.6 mm
Range of Weights :	0.20 - 0.53 g	Range of Fork Lengths :	32 - 39 mm
Fish Loading Rate :	0.17 g/L		

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Total Organisms Per Test Level :	10
Organism Batch :	T06-20		

<original signed by>

Date: 2007-01-11

Approved by:

Project Manager

Certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL)

Work Order: 210742
Sample Number: 17673

Total Pre-Aeration Time (h)		pH	D.O. (mg/L)	Cond. (umhos)	Temp. (°C)	O_2 Sat. (%)*
	Initial Water Chemistry:	8.9	9.7	8010	14.0	–
0:30	Chemistry after 30min air:	8.9	9.7	8040	15.0	100

0 hours

Date & Time 2007-01-04 14:30
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O_2 Sat. (%)*
100	0	0	8.9	9.7	8040	15.0	100
50	0	0	8.7	9.8	4454	15.0	
25	0	0	8.5	9.6	2547	15.0	
13	0	0	8.3	9.8	1657	15.0	
6	0	0	8.3	9.9	1084	15.0	
Control	0	0	8.2	9.7	614	15.0	100

Notes:

24 hours

Date & Time 2007-01-05 14:30
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	16.0
50	0	0	–	–	–	16.0
25	0	0	–	–	–	16.0
13	0	0	–	–	–	16.0
6	0	0	–	–	–	16.0
Control	0	0	–	–	–	16.0

Notes:

48 hours

Date & Time 2007-01-06 14:30
Technician: CD(JGG)

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	15.0
50	0	0	–	–	–	15.0
25	0	0	–	–	–	15.0
13	0	0	–	–	–	15.0
6	0	0	–	–	–	15.0
Control	0	0	–	–	–	15.0

Notes:

72 hours

Date & Time 2007-01-07 14:30
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	15.0
50	0	0	–	–	–	15.0
25	0	0	–	–	–	15.0
13	0	0	–	–	–	15.0
6	0	0	–	–	–	15.0
Control	0	0	–	–	–	15.0

Notes:

96 hours

Date & Time 2007-01-08 14:30
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	8.5	8.7	8110	15.0
50	0	0	8.5	8.7	4481	15.0
25	0	0	8.3	8.7	2547	15.0
13	0	0	8.4	8.9	1600	15.0
6	0	0	8.4	8.9	1026	15.0
Control	0	0	8.3	8.3	561	15.0

Notes:

# of control organisms showing stress: 0
Trout Batch #: T06-20

Number immobile does not include number of mortalities.
* adjusted for actual temp. & barometric pressure
"–" = not measured

Test Data Reviewed By: JP
Date: 2007-01-08

CHAIN OF CUSTODY RECORD

Stantec

Stantec Work Order No:

Shipping Address: Stantec Consulting Ltd.
11B Nicholas Beaver Road, RR #3
Guelph, Ontario Canada N1H 6H9

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number:	
Field Sampler Name (print):	Jaime Hogan, Kelly Wells, John Moostoos
Signature:	Jaime Hogan
Affiliation:	Canada North Environmental Services
Sample Storage (prior to shipping):	Transported to Prince Albert from site (2h)
Custody Relinquished by:	Jaime Hogan
Date/Time Shipped:	January 3, 2007 / 1500

Client:	Canada North Environmental Services (CanNorth) 4-130 Robin Crescent Saskatoon, SK, S7L 6M7
Phone:	(306) 652-4432
Fax:	(306) 652-4431
Contact:	Jaime Hogan or Kelly Wells

Sample Identification					Analyses Requested										Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	Stantec Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Lemna minor* Growth	*Selenastrum capricornutum* Growth	RISS Data Entry	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2007-01-03	1230	WRS03	17672			✓		✓	✓	✓	✓	✓		✓		✓	46L + 2L +30L
2007-01-03	1130	MWS01	17673			✓		✓	✓	✓	✓	✓		✓		✓	46L + 2L +30L
		23L pails		12.0°C													
		10L bags		2.0°C													

2007-01-05

For Lab Use Only

Received By:	P (Stantec)
Date:	2007-01-04
Time:	11:00
Storage Location:	
Storage Temp.(°C)	

Please list any special requests or instructions:

Contact Jaime on Thursday morning for details regarding changes to the standard dilution percentages for the above toxicity tests. Water quality parameters to be analysed as previously discussed with Keith; finalize these on Thursday as well.

Shipped three coolers and four buckets

*One cooler missing from shipment. Stantec personnel picked up missing piece at Nisku. 2007-01-04 AP.

APPENDIX B

STATION WRS-03

Stantec Consulting Ltd.
11B Nicholas Beaver Road, RR3
Guelph ON N1H 6H9
Tel: (519) 763-4412 Fax: (519) 763-4419
stantec.com

TOXICITY TEST REPORT
Daphnia magna

Stantec

Work Order : 210742
Sample Number : 17672 WRS-03

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services	Time Collected :	12:30
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	WRS03	Date Received :	2007-01-04
Sampling Method :	Composite	Date Tested :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Temp. on arrival :	12.0° C
Sample Description:	Clear, yellow, odourless.		

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*. Environment Canada EPS 1/RM/14 (Second Edition, December 2000).

TEST RESULTS

Effect	Value	95% Confidence Limits	Slope	Calculation Method
48-h LC50	>100%	-	-	-

The results reported relate only to the sample tested.

SODIUM CHLORIDE REFERENCE TOXICANT DATA

Organism Batch :	Dm06-26		
Date Tested (y/m/d) :	2007-01-03	Historical Mean LC50 :	6.5 g/L
LC50 (95% Confidence Limits) :	7.0 g/L (5.8 - 8.0)	Warning Limits (± 2SD) :	5.6 - 7.5 g/L
Statistical Method :	Non-Linear Interpolation	Analyst(s) :	JP

Daphnia magna CULTURE HEALTH DATA

Time to First Brood :	9.2 days	Mean Young Per Brood :	38.2
Culture Mortality :	1.8 % (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	4
pH Adjustment :	None	Test Organisms / Replicate :	3
Test Aeration :	None	Total Organisms / Test Level :	12
Organism Batch :	Dm06-26	Organism Loading Rate :	16.7 mL/organism

<original signed by>

Date: 2007-01-11

Approved by: Project Manager

Certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL)

Stantec

Daphnia magna TOXICITY TEST REPORT

Work Order: 210742
Sample Number: 17672

	Hardness (mg/L as $CaCO_3$)	Hardness Adjustment	pH	D.O. (mg/L)	Cond. (µs)	Temp. (°C)	O_2 Sat. (%)*	Total Pre-Aeration Time (h) @ 30 mL/min/L
Initial Water Chemistry:	420	None	7.8	10.7	3270	19.0	121	0:30

0 hours

Date & Time 2007-01-04 14:40
Technician: JP/SM

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O_2 Sat. (%)*	Hardness
100	0	0	8.0	10.2	3280	20.0	116	420
50	0	0	8.2	9.3	1880	19.5		
25	0	0	8.3	9.4	1155	19.5		
13	0	0	8.4	9.3	799	19.5		
6	0	0	8.4	9.4	588	19.5		
Control	0	0	8.5	9.0	396	19.5	102	200

Notes:

24 hours

Date & Time 2007-01-05 14:40
Technician: JP

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	20.0
50	0	0	–	–	–	20.0
25	0	0	–	–	–	20.0
13	0	0	–	–	–	20.0
6	0	0	–	–	–	20.0
Control	0	0	–	–	–	20.0

Notes:

48 hours

Date & Time 2007-01-06 14:40
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	8.3	9.3	3250	20.0
50	0	0	8.5	7.9	1847	20.0
25	0	0	8.5	8.3	1092	20.0
13	0	0	8.5	9.1	760	20.0
6	0	0	8.5	9.0	577	20.0
Control	0	0	8.5	9.0	397	20.0

Notes:

# of control organisms showing stress: 0
Daphnia Batch #: Dm06-26

Number immobile does not include number of mortalities.

– = not measured
* adjusted for actual temp. & barometric pressure

Test Data Reviewed By: JP
Date: 2007-01-09

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Tel: (519) 763-4412 Fax: (519) 763-4419
stantec.com

TOXICITY TEST REPORT
Rainbow Trout

Stantec

Work Order : 210742
Sample Number : 17672

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services	Time Collected :	12:30
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	WRS03	Date Received :	2007-01-04
Sampling Method :	Composite	Date Tested :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Temp. on arrival :	12.0 °C
Sample Description :	Clear, yellow, odourless.		

Test Method : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (Second Edition, December 2000).

TEST RESULTS

Effect	Value	95% Confidence Limits	Slope	Calculation Method
96-h LC50	>100%	-	-	-

The results reported relate only to the sample tested.

POTASSIUM CHLORIDE REFERENCE TOXICANT DATA

Organism Batch :	T06-20		
Date Tested (y/m/d) :	2007-01-02	Historical Mean LC50 :	3849 mg/L
LC50 (95% Confidence Limits) :	3815 mg/L (3370 - 4274)	Warning Limits (± 2SD) :	3152 - 4706 mg/L
Statistical Method :	Probit	Analyst(s) :	CT/FS/JGG

TEST FISH

Control Fish Sample Size :	10	Cumulative stock tank mortality :	0 % (prev. 7 days)
Mean Fish Weight (± 2 SD) :	0.48 ± 0.27 g	Mean Fish Fork Length (± 2 SD) :	37.5 ± 7.3 mm
Range of Weights :	0.29 - 0.71 g	Range of Fork Lengths :	32 - 44 mm
Fish Loading Rate :	0.24 g/L		

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Total Organisms Per Test Level :	10
Organism Batch :	T06-20		

<original signed by>

Date: 2007-01-11

Approved by: _____
Project Manager

Certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL)

Work Order: 210742
Sample Number: 17672

Total Pre-Aeration Time (h)		pH	D.O. (mg/L)	Cond. (umhos)	Temp. (°C)	O_2 Sat. (%)*
	Initial Water Chemistry:	7.9	10.0	3428	14.0	–
0:30	Chemistry after 30min air:	7.9	9.7	3445	14.0	100

0 hours

Date & Time 2007-01-04 14:30
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O_2 Sat. (%)*
100	0	0	7.9	9.7	3445	14.0	100
50	0	0	8.1	9.8	2039	15.0	
25	0	0	8.2	9.9	1354	15.0	
13	0	0	8.2	9.7	996	15.0	
6	0	0	8.2	9.6	793	15.0	
Control	0	0	8.2	9.7	614	15.0	100

Notes:

24 hours

Date & Time 2007-01-05 14:30
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	16.0
50	0	0	–	–	–	16.0
25	0	0	–	–	–	16.0
13	0	0	–	–	–	16.0
6	0	0	–	–	–	16.0
Control	0	0	–	–	–	16.0

Notes:

48 hours

Date & Time 2007-01-06 14:30
Technician: CD(JGG)

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	15.0
50	0	0	–	–	–	15.0
25	0	0	–	–	–	15.0
13	0	0	–	–	–	15.0
6	0	0	–	–	–	15.0
Control	0	0	–	–	–	15.0

Notes:

72 hours

Date & Time 2007-01-07 14:30
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	15.0
50	0	0	–	–	–	15.0
25	0	0	–	–	–	15.0
13	0	0	–	–	–	15.0
6	0	0	–	–	–	15.0
Control	0	0	–	–	–	15.0

Notes:

96 hours

Date & Time 2007-01-08 14:30
Technician: JGG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	8.4	8.8	3459	15.0
50	0	0	8.4	8.2	2051	15.0
25	0	0	8.5	8.7	1361	15.0
13	0	0	8.6	8.3	1014	15.0
6	0	0	8.5	7.8	794	15.0
Control	0	0	8.3	7.9	597	15.0

Notes:

# of control organisms showing stress: 0
Trout Batch #: T06-20

Number immobile does not include number of mortalities.
* adjusted for actual temp. & barometric pressure
"–" = not measured

Test Data Reviewed By:
Date: 2007.01.08

APPENDIX C

SUBLETHAL TOXICITY TEST RESULTS FROM STATIONS MWS-01 AND WRS-03, JANUARY 2007

APPENDIX C

STATION MWS-01

Stantec Consulting Ltd.
11B Nicholas Beaver Road RR3
Guelph ON N1H 6H9
Tel: (519) 763-4412 Fax: (519) 763-4419
stantec.com

Stantec

Work Order : 210742
Sample Number : 17673 MWS-01

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services		
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	MWS01	Time Collected :	11:30
Sampling Method :	Composite	Date Received :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Time Received :	11:00
Temp. on arrival :	2.0°C	Date Tested :	2007-01-06
Sample Description:	Cloudy, grey, odourless.		
Test Method :	Test of Reproduction and Survival using the Cladoceran *Ceriodaphnia dubia*. Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/21 (as amended November 1997).		

TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
LC50 (Survival)	16.4%	10.0-27.0	Probit (Stephan) a
IC25 (Reproduction)	4.1%	3.5-4.7	Linear Interpolation (Toxstat 3.5) b

The results reported relate only to the sample tested.

SODIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2007-01-12	Statistical Method :	Linear Interpolation (Toxstat 3.5)[b]
Organism Batch :	Cd07-01	Historical Mean IC25 :	1.28 g/L
Test Duration :	7 days	Warning Limits (± 2SD) :	0.88 - 1.89
IC25 Reproduction :	1.17 g/L	Analyst(s) :	SM/NK
95% Confidence Limits :	0.81-1.37		

TEST CONDITIONS

Test Organism :	*Ceriodaphnia dubia*	Sample Filtration :	None
Organism Batch :	Cd07-01	Test Aeration :	None
Source :	Stantec In-house Culture	Control/Dilution Water :	Well water with 29.6 mg/L NaCl
Age (on Test Day 0) :	≤24 h (within 12 h of same age)	Test Volume per Replicate :	15 mL
Culture Mortality :	0 % (during previous 7 days)	Test Vessel :	22 mL polystyrene vial
Mean Young Produced :	≥ 15.0 (during previous 7 days)	Depth of Test Solution :	4.0 cm
Young Produced :	≥ 6.0 (previous brood)	Organisms per Replicate :	1
Ephippia in Culture :	None	Number of Replicates :	10
pH Adjustment :	None	Daily Renewal Method :	Transferred to fresh solutions
Hardness Adjustment :	None	Test Method Deviation(s) :	None

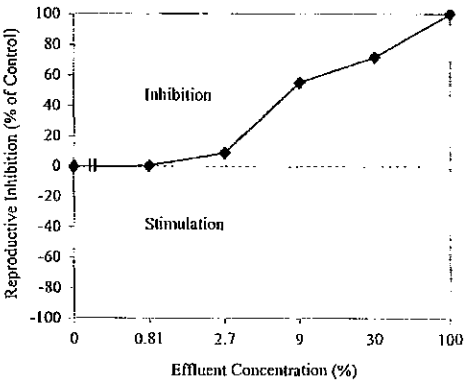
COMMENTS

All test validity criteria as specified in the test method cited above were satisfied.
No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

Work Order : 210742
Sample Number : 17673

SUMMARY OF TEST DATA

***Ceriodaphnia dubia* Reproductive Inhibition**



Total Neonates per Test Organism at Test Completion

	Effluent Concentration (%)					
Replicate	**Control**	**0.81**	**2.7**	**9**	**30**	**100**
1	29	28	32	0	8	0
2	37	6*	25	19	11	0
3	29	34	27	15	7	0
4	36	31	32	19	12	0
5	36	35	32	10	8	0
6	31	37	30	16	9	0
7	37	35	30	15	13	0
8	35	32	31	16	6	0
9	32	34	33	20	11	0
10	31	32	31	20	9	0
Mean	33.3	33.1	30.3	15.0	9.4	0.0

* this value was not included in the total # of young, due to accidental mortality.

Cumulative Daily Test Organism Mortality (%)

		Effluent Concentration (%)					
Date	**Test Day**	Control	0.81	2.7	9	30	100
2007-01-07	1	0	0	0	0	0	100
2007-01-08	2	0	0	0	0	0	100
2007-01-09	3	0	0	0	10	0	100
2007-01-10	4	0	0	0	10	0	100
2007-01-11	5	0	0	0	20	70	100
2007-01-12	6	0	0	0	20	80	100
Total Mortality (%)		0	0	0	20	80	100

REFERENCES

[a] Stephan, C. E. 1977. Methods for calculating an LC50. pp 65-84 in : P. L. Mayer and J. L. Hamelink (eds.), Aquatic Toxicology and Hazard Evaluation. Amer. Soc. Testing and Materials, Philadelphia PA. ASTM STP 634.

[b] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

<original signed by>

Date : 2007-01-25

Approved By: Project Manager

Work Order : 210742
Sample Number : 17673

Ceriodaphnia dubia Survival and Reproduction

Test Initiation Date : 2007-01-06
Initiation Time : 11:45
Initiated By : RD
Test Completion Date : 2007-01-12

Concentration (%) Control	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young	Analyst(s)
2007-01-07	1	0	0	0	0	0	0	0	0	0	0	0	RD
2007-01-08	2	0	0	0	0	0	0	0	0	0	0	0	RD
2007-01-09	3	6	7	5	7	7	6	7	6	6	6	6.3	AS
2007-01-10	4	0	0	0	13	0	0	0	0	0	0	1.3	KJ
2007-01-11	5	11	12	9	0	13	10	14	10	11	10	10	KJ
2007-01-12	6	12	18	15	16	16	15	16	19	15	15	15.7	AS

Concentration (%) 9	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young
2007-01-07	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	3	0 x	7	5	6	5	6	6	4	5	5	4.9
2007-01-10	4	0	0	0	0	0	0	0	0	0	0	0
2007-01-11	5	0	12	10	6	5	x 10	9	12	10	10	8.4
2007-01-12	6	0	0	0	7	0	0	0	0	5	5	1.7

Concentration (%) 0.81	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young
2007-01-07	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	3	3	6	6	6	7	5	6	6	7	6	5.8
2007-01-10	4	0	0	0	11	0	0	0	0	2	0	1.3
2007-01-11	5	12	0 *	11	0	13	14	12	10	10	12	10.444
2007-01-12	6	13	0	17	14	15	18	17	16	15	14	15.444

Concentration (%) 30	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young
2007-01-07	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	3	3	4	3	6	5	3	4	5	5	4	4.2
2007-01-10	4	0	0	0	0	0	0	0	0	0	0	0
2007-01-11	5	5 x	7 x	4	6 x	3 x	6	9	1 x	6 x	5 x	5.2
2007-01-12	6	0	0	0 x	0	0	0	0	0	0	0	0

Concentration (%) 2.7	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young
2007-01-07	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	3	7	5	6	4	7	6	6	6	7	5	5.9
2007-01-10	4	11	0	0	15	0	0	0	0	0	0	2.6
2007-01-11	5	0	7	9	0	11	11	9	10	11	14	8.2
2007-01-12	6	14	13	12	13	14	13	15	15	15	12	13.6

Concentration (%) 100	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young
2007-01-07	1	0 x	0 x	0 x	0 x	0 x	0 x	0 x	0 x	0 x	0 x	0
2007-01-08	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	3	0	0	0	0	0	0	0	0	0	0	0
2007-01-10	4	0	0	0	0	0	0	0	0	0	0	0
2007-01-11	5	0	0	0	0	0	0	0	0	0	0	0
2007-01-12	6	0	0	0	0	0	0	0	0	0	0	0

NOTES : 2006-01-11: Accidental mortality in vial 0.81-2. KJ
2007-01-23: The adult that suffered accidental mortality in vial 0.81-2 was excluded from statistical analysis. Percent mortality and mean # of young were calculated using only 9 replicates for the 0.81% concentration. JJ

"x" = adult mortality
"*" = accidental adult mortality

Data Reviewed By : JJ
Date : 2007-01-23

Work Order : 210742
Sample Number: 17673

Ceriodaphnia dubia Water Chemistry Data

Initial Chemistry:	Temp. (°C)	DO (mg/L)	pH	Conductivity (µmhos/cm)	Hardness (mg/L as $CaCO_3$)
	25.0	7.9	8.7	7780	160

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Effluent Sub-sample Used		1	1	1	2	2	3
Temperature (°C)		25.0	24.5	25.0	24.0	24.0	24.5
Dissolved Oxygen (mg/L)		7.9	8.8	8.5	8.4	8.9	9.5
Dissolved Oxygen % Sat.[1]		100	108	106	105	107	114
Pre-aeration Time (min)[2]		0	20	20	20	20	20
Analyst(s)	Initial	CD(RD)	EW	CT(RD)	EJ	HR	CT(HR)
	Final	EW	CT(RD)	AS	HR	JGG	NK
Control (0%)							
Temp. (°C)	Initial	24.0	25.0	25.0	24.0	25.0	24.0
	Final	25.0	24.5	24.0	24.0	25.0	24.5
DO % Sat.[1]	Initial	97	98	100	100	99	101
DO (mg/L)	Initial	7.9	7.9	7.8	8.0	7.9	8.3
	Final	7.0	6.6	7.2	7.3	7.9	8.0
pH	Initial	8.3	8.4	8.4	8.3	8.4	8.2
	Final	8.4	8.3	8.2	8.3	8.1	8.5
Cond. (µmhos/cm)	Initial	562	545	555	575	535	591
0.81 %							
Temp. (°C)	Initial	24.0	25.0	25.0	24.0	25.0	24.0
	Final	25.0	24.5	24.0	24.0	25.0	24.5
DO (mg/L)	Initial	7.8	8.1	7.9	8.0	8.2	8.4
	Final	6.6	7.1	7.3	7.2	7.3	8.1
pH	Initial	8.4	8.4	8.3	8.3	8.4	8.2
	Final	8.3	8.3	8.3	8.4	8.1	8.4
Cond. (µmhos/cm)	Initial	643	619	623	638	602	647
9 %							
Temp. (°C)	Initial	24.0	25.0	25.0	24.0	25.0	24.0
	Final	25.0	24.5	24.0	24.0	25.0	24.5
DO (mg/L)	Initial	7.9	7.9	8.0	7.9	8.2	8.4
	Final	6.7	7.2	7.7	7.4	7.5	8.1
pH	Initial	8.4	8.5	8.4	8.3	8.4	8.2
	Final	8.2	8.3	8.4	8.3	8.2	8.4
Cond. (µmhos/cm)	Initial	1309	1250	1256	1271	1253	1292
100 %							
Temp. (°C)	Initial	24.0	25.0	–	–	–	–
	Final	25.0	–	–	–	–	–
DO (mg/L)	Initial	8.0	8.4	–	–	–	–
	Final	6.6	–	–	–	–	–
pH	Initial	8.6	8.7	–	–	–	–
	Final	8.4	–	–	–	–	–
Cond. (µmhos/cm)	Initial	7800	7810	–	–	–	–

"–" = not measured

[1] % saturation (adjusted for actual temperature and barometric pressure)

[2] ≤100 bubbles/minute

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Work Order : 210742
Sample Number : 17673

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services		
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	MWS01	Time Collected :	11:30
Sampling Method :	Composite	Date Received :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Time Received :	11:00
Temp. on arrival :	2.0°C	Date Tested :	2007-01-06
Sample Description:	Cloudy, grey, odourless.		
Test Method :	Test of Growth and Survival using fathead minnows. Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/22 (as amended November 1997).		

TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Growth)	>100%	-	-
LC50 (Survival)	>100%	-	-

The results reported relate only to the sample tested.

POTASSIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2007-01-02	Statistical Method :	Linear Interpolation (Toxstat 3.5)b
Organism Batch :	Fm07-01	Historical Mean IC25 :	0.86 g/L
Test Duration :	7 days	Warning Limits (± 2SD) :	0.65 - 1.16
IC25 Survival :	0.69 g/L	Analyst(s) :	SM/CT/EW/RD/KJ
95% Confidence Limits :	0.65 - 0.73		

TEST CONDITIONS

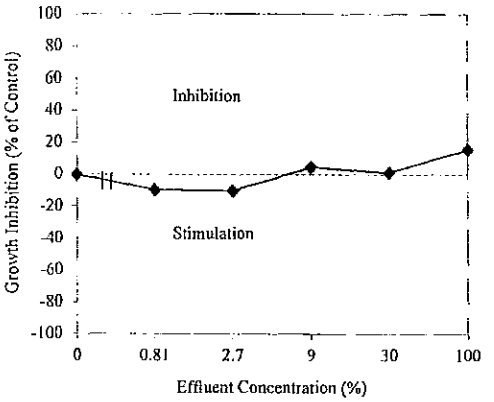
Test Organism :	*Pimephales promelas*	Test Type :	Static Renewal
Organism Batch :	Fm07-01	Control/Dilution Water :	Well water with 29.6 mg/L NaCl
Source :	Stantec In-house Culture	Test Volume / Replicate :	300 mL
Life Stage :	Larval (<24 h old)	Test Vessel :	420 mL polystyrene beaker
Culture Mortality :	0.3 % (previous 7 days)	Depth of Test Solution :	8 cm
pH Adjustment :	None	Organisms per Replicate :	10
Sample Filtration :	None	Number of Replicates :	3
Hardness Adjustment :	None	Daily Renewal Method :	80-85% syphoned and replaced
Test Aeration :	None	Test Method Deviation(s):	None

COMMENTS

All test validity criteria as specified in the test method cited above were satisfied.
No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

Work Order : 210742
Sample Number : 17673

Fathead Minnow Growth Inhibition



REFERENCES

[a] Stephan, C. E. 1977. Methods for calculating an LC50. pp 65-84 in : P. L. Mayer and J. L. Hamelink (eds.), Aquatic Toxicology and Hazard Evaluation. Amer. Soc. Testing and Materials, Philadelphia PA. ASTM STP 634.

[b] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

<original signed by>

Date : 2007-01-25

Approved By : _____
Project Manager

Work Order : 210742
Sample Number : 17673

Larval Fathead Minnow Mortality Data

Initiation Time (h)		Day 0 (Initiation)	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7 (Completion)		
12:15		2007-01-06	2007-01-07	2007-01-08	2007-01-09	2007-01-10	2007-01-11	2007-01-12	2007-01-13		
	Analyst(s):	RD	RD	KJ	CT(RD)	SM(RD)	EJ	EJ	JJ		
Concentration (%)	Replicate	Mortality								Mean Mortality (%)	Standard Deviation
Control	A	0	0	0	0	0	0	0	0	0.0	0.00
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	0		
0.81	A	0	0	0	0	0	0	0	0	0.0	0.00
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	0		
2.7	A	0	0	0	0	0	0	0	0	3.3	0.58
	B	0	0	0	0	0	1	1	1		
	C	0	0	0	0	0	0	0	0		
9	A	0	0	0	0	0	0	0	0	0.0	0.00
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	0		
30	A	0	0	0	0	0	0	0	0	0.0	0.00
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	0		
100	A	0	0	0	0	0	0	0	0	0.0	0.00
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	0		

Aberrant behaviour or swimming impairment : None

Larval Fathead Minnow Weight Data

Concentration (%)	Replicate	Number of Larvae Weighed	Mean Dry Weight of Larvae (mg)	Treatment Mean Dry Weight (mg)	Standard Deviation
Control	A	10	0.615	0.563	0.048
	B	10	0.553		
	C	10	0.521		
0.81	A	10	0.514	0.618	0.092
	B	10	0.650		
	C	10	0.689		
2.7	A	10	0.551	0.621	0.063
	B	9	0.640		
	C	10	0.673		
9	A	10	0.607	0.538	0.066
	B	10	0.531		
	C	10	0.476		
30	A	10	0.557	0.557	0.015
	B	10	0.571		
	C	10	0.542		
100	A	10	0.457	0.474	0.019
	B	10	0.495		
	C	10	0.469		

Data Reviewed By: JJ
Date : 2007-01-23

Work Order : 210742
Sample Number: 17673

Fathead Minnow Water Chemistry Data

Initial Chemistry:	Temp. (°C)	DO (mg/L)	pH	Conductivity (µmhos/cm)	Hardness (mg/L as $CaCO_3$)
	25.0	7.9	8.7	7780	160

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Effluent Sub-sample Used	1	1	1	2	2	3	3
Temperature (°C)	25.0	24.5	25.0	24.0	24.0	24.5	24.5
Dissolved Oxygen (mg/L)	7.9	8.8	8.5	8.4	8.9	9.5	8.9
Dissolved Oxygen % Sat.[1]	100	108	106	105	107	114	111
Pre-aeration Time (min)[2]	0	20	20	20	20	20	20

Analyst(s) :	Initial	CD(RD)	EW	CT(RD)	EJ	HR	CT(HR)	NK
	Final	EW	CT(RD)	CT	HR	JGG	NK	CD(HR)
Control (0%)								
Temp.(°C)	Initial	24.0	25.0	25.0	24.0	25.0	24.0	25.0
	Final	25.0	25.0	25.0	25.0	25.0	24.5	25.0
DO % Sat.	Initial	97	98	100	100	99	101	98
DO (mg/L)	Initial	7.9	7.9	7.8	8.0	7.9	8.3	7.8
	Final	6.5	6.5	7.0	7.6	7.4	7.3	7.6
pH	Initial	8.3	8.4	8.4	8.3	8.4	8.2	8.3
	Final	8.4	8.2	8.2	8.3	8.2	8.3	8.3
Cond. (µmhos/cm)	Initial	562	545	555	575	535	591	511
0.81 %								
Temp.(°C)	Initial	24.0	25.0	25.0	24.0	25.0	24.0	25.0
	Final	25.0	25.0	25.0	25.0	25.0	24.5	25.0
DO (mg/L)	Initial	7.8	8.1	7.9	8.0	8.2	8.4	8.0
	Final	6.5	6.3	6.6	7.6	7.4	7.3	7.2
pH	Initial	8.4	8.4	8.3	8.3	8.4	8.2	8.3
	Final	8.3	8.1	8.2	8.3	8.2	8.2	8.2
Cond. (µmhos/cm)	Initial	643	619	623	638	602	647	591
9 %								
Temp.(°C)	Initial	24.0	25.0	25.0	24.0	25.0	24.0	25.0
	Final	25.0	25.0	25.0	25.0	25.0	24.5	25.0
DO (mg/L)	Initial	7.9	7.9	8.0	7.9	8.2	8.4	8.0
	Final	6.8	6.7	7.0	7.8	7.2	7.3	7.3
pH	Initial	8.4	8.5	8.4	8.3	8.4	8.2	8.4
	Final	8.3	8.2	8.2	8.3	8.1	8.2	8.2
Cond. (µmhos/cm)	Initial	1309	1250	1256	1271	1253	1292	1222
100 %								
Temp.(°C)	Initial	24.0	25.0	25.0	24.0	25.0	24.0	25.0
	Final	25.0	25.0	25.0	25.0	25.0	24.5	25.0
DO (mg/L)	Initial	8.0	8.4	8.0	8.0	8.2	8.4	8.2
	Final	7.0	6.8	7.3	7.6	7.2	7.1	5.7
pH	Initial	8.6	8.7	8.7	8.7	8.7	8.7	8.7
	Final	8.5	8.5	8.5	8.5	8.4	8.4	8.5
Cond. (µmhos/cm)	Initial	7800	7810	7790	7760	7830	7840	7830

"–" = not measured

[1] % saturation (adjusted for actual temperature and barometric pressure)

[2] ≤100 bubbles/minute

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Work Order : 210742
Sample Number : 17673

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services		
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	MWS01	Time Collected :	11:30
Sampling Method :	Composite	Date Received :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Time Received :	11:00
Temp. on arrival :	2.0°C	Date Tested :	2007-01-05
Sample Description:	Cloudy, grey, odourless.		
Test Method :	Test for Measuring the Inhibition of Growth using the Freshwater Macrophyte, *Lemna minor*. Method Development and Application Section, Environmental Technology Centre, Environment Canada. Ottawa, Ontario. Report EPS 1/RM/37.		

TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Weight)	>97.0%	-	-
IC25 (Frond Production)	53.7%	30.2-57.6	Linear Interpolation (Toxstat 3.5) a

The results reported relate only to the sample tested.

POTASSIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2006-12-22	Statistical Method :	Linear Interpolation (Toxstat 3.5)[a]
Organism Batch :	Lm06-12	Historical Mean IC25 :	2.32 mg/L
Test Duration :	7 days	Warning Limits (± 2SD) :	1.35 - 4.09
IC25 (Frond Production) :	1.95 g/L	Analyst(s) :	HR/NK
95% Confidence Limits :	1.18 - 2.40		

TEST CONDITIONS

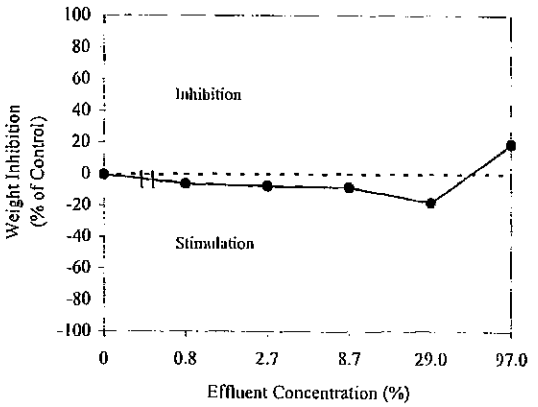
Test Organism :	*Lemna minor* L., Strain 7730	Test Type :	Static (no sub-samples required)
Organism Batch :	Lm06-12	Control/Dilution Medium :	Modified APHA
Culture Origin :	UTCC 492	Medium Preparation Water :	Millipore Milli-Q
Test Organism Source :	Axenic in-house culture	Source of Water :	University of Guelph, Guelph ON
Age (on Test Day 0) :	10 days	Medium Preparation Chemicals :	Modified APHA stocks A, B,C (10 mL/L)
Health Criteria (in APHA) :	8.2-fold frond increase in 7 days	Nutrient Spiking of Sample :	Modified APHA stocks A, B,C (10 mL/L)
Organism Acclimation :	21:05 h in APHA medium	Replicates per Concentration :	3
Inoculum (Test Day 0) :	2 plants (3 fronds per plant)	Test Volume per Replicate :	100 mL
Sample Filtration :	1 µm (Whatman GF/C)	Test Vessel :	250 mL glass Erlenmeyer flask
Sample Pre-aeration :	20 min. at ≤100 bubbles/min.	Depth of Test Solution :	4.0 cm
pH Adjustment :	None	Photoperiod/Light Intensity :	Continuous, 4231 - 4641 lux
Hardness Adjustment :	None	Test Method Deviation(s) :	None

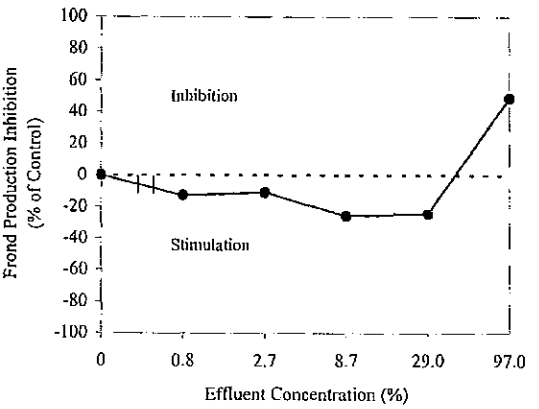
COMMENTS

•All test validity criteria as specified in the test method cited above were satisfied.
•Concentrations where frond production/weights was greater than the control were replaced with control values for statistical analysis as recommended by Environment Canada (2005).

Work Order : 210742
Sample Number : 17673

Lemna minor Growth Inhibition





TEST MONITORING

Initiation Date : 2007-01-05
Intitiation Time : 14:15
Initiated By : HR

Termination Date : 2007-01-12
Termination Time : 14:15
Terminated By : KJ(HR)

Temperature Monitoring

Test Day	Date	Temperature (°C)
0 (unmodified sample)	2007-01-05	25.0
0	2007-01-05	24.5
1	2007-01-06	24.5
2	2007-01-07	24.5
3	2007-01-08	24.5
4	2007-01-09	24.5
5	2007-01-10	24.5
6	2007-01-11	25.0
7	2007-01-12	24.5

pH Monitoring

Concentration (%)	Day 0	Day 7
100 (unmodified sample)	8.8	–
Control	8.2	8.2
0.8	8.3	8.3
2.7	–	–
8.7	8.4	8.4
29.0	–	–
97.0	8.6	8.8

"–" = not required

REFERENCES

[a] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

Environment Canada. 2005. Guidance Document on Statistical Methods for Environmental Toxicity Tests. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Environmental Protection Service. Ottawa, Ontario. EPS 1/RM/46, March 2005.

<original signed by>

Date : 2007-01-25

Approved By:

Project Manager

Work Order : 210742
Sample Number : 17673

Lemna minor Frond Increase

Concentration (%)	Replicate	Frond Count Day 0*	Frond Count Day 7	Frond Increase	Mean Frond Increase	Standard Deviation	CV (%)	Frond/Root Appearance (Day 7)
Control	A	6	53	47	52.3	5.5	10.5	Fronds healthy, appearance normal in all replicates.
	B	6	58	52				
	C	6	64	58				
0.8	A	6	70	64	59.0	4.6	7.8	Fronds healthy, appearance normal in all replicates.
	B	6	61	55				
	C	6	64	58				
2.7	A	6	72	66	58.0	8.5	14.7	Fronds healthy, appearance normal in all replicates.
	B	6	65	59				
	C	6	55	49				
8.7	A	6	69	63	65.7	2.5	3.8	Fronds healthy, appearance normal in all replicates.
	B	6	72	66				
	C	6	74	68				
29.0	A	6	84	78	65.0	11.3	17.3	Fronds healthy, appearance normal in all replicates.
	B	6	65	59				
	C	6	64	58				
97.0	A	6	34	28	26.7	2.3	8.7	Fronds clumping and darker green in all replicates.
	B	6	30	24				
	C	6	34	28				

NOTES: * No unusual appearance or treatment of culture prior to testing. Test inoculated with healthy plants.
- A 9.7-fold increase in frond number was observed in the control over the testing period.
- Light brown debris was observed at the bottom of the flasks in all concentrations. KJ

Lemna minor Frond Weight Data

Concentration (%)	Replicate	Dry Weight of Fronds (mg)	Mean Treatment Dry Weight (mg)	Standard Deviation
Control	A	5.44	5.86	0.38
	B	5.94		
	C	6.19		
0.8	A	6.07	6.21	0.35
	B	5.95		
	C	6.61		
2.7	A	7.02	6.31	0.68
	B	6.24		
	C	5.66		
8.7	A	6.20	6.36	0.40
	B	6.81		
	C	6.06		
29.0	A	7.49	6.91	0.50
	B	6.58		
	C	6.67		
97.0	A	5.03	4.76	0.24
	B	4.57		
	C	4.69		

Test Data Reviewed By : NC
Date : 2007-01-17

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Stantec

Work Order : 210742
Sample Number : 17673

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services		
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	MWS01	Time Collected :	11:30
Sampling Method :	Composite	Date Received :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Time Received :	11:00
Temp. on arrival :	2.0°C	Date Tested :	2007-01-05
Sample Description:	Cloudy, grey, odourless.		
Test Method :	Growth Inhibition Test Using the Freshwater Alga *Selenastrum capricornutum*. Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/25 (as amended November 1997).		

TEST RESULTS*

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Growth)	>100%	-	-

The results reported relate only to the sample tested.

SODIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2007-01-16	Statistical Method :	Linear Interpolation (Toxstat 3.5)[a]
Organism Batch :	Sel07-01	Historical Mean IC25 :	576.7 mg/L
Test Duration :	72 hours	Warning Limits (± 2SD) :	275.5 - 1233.0
IC25 Growth :	389.9 mg/L	Analyst(s) :	HR
95% Confidence Limits :	340.3 - 490.6		

TEST CONDITIONS

Test Organism :	*Selenastrum capricornutum*	Control/Dilution Water :	Millipore Milli-Q (no chemicals added)
Organism Batch :	Scl07-01	Test Vessel :	U-shaped polystyrene microplate
Strain Number :	UTCC37	Volume per Replicate :	220 µL
Source :	Stantec In-house Culture	Number of Control Replicates:	10
Age (on Test Day 0) :	4 days (in logarithmic growth)	Number of Test Replicates :	3
pH Adjustment :	None	Concentrations Tested :	10 + Control
Hardness Adjustment :	None	Photoperiod / Light Intensity :	Continuous light, 3995 - 4022 lux
Sample Pre-aeration :	None	Mean Test Temperature (± SD):	24.9°C (± 0.3)
Sample Filtration :	0.45 µm preconditioned filter	Test Duration :	72 hours
Volume Filtered:	≥10 mL	Test Method Deviation(s) :	None

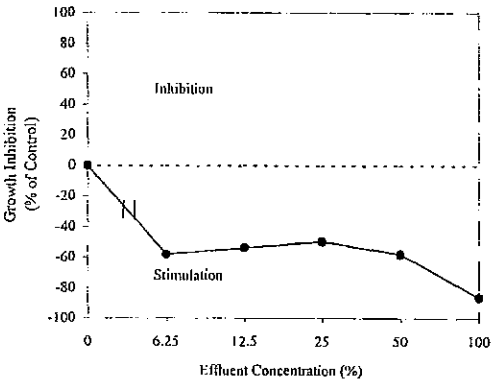
COMMENTS

*Results do not incorporate the 0.9091dilution factor incurred by the addition of enrichment medium and algal inoculum.
•All test validity criteria as specified in the test method cited above were satisfied.
•No unusual appearance or treatment of culture prior to testing.

Stantec

Work Order : 210742
Sample Number : 17673

***Selenastrum capricornutum* Growth Inhibition**



Cell Enumeration at 72-hours

Initiation Date :	2007-01-05	Sample pH (at 0 hours) :	8.8
Initiated By :	AS/HR	Control pH (at 0 hours) :	6.5
Completion Date :	2007-01-08	Control pH (at 72 hours) :	6.5
Enumerated By :	KJ(HR)	Initial Algal Inoculum :	1.0591 cells/mL (x 10 000)
Enumeration Technique :	Manual (hemocytometer)	Inoculum Prepared :	00:30 h prior to test initiation

Concentration	Cell Concentration (x10 000) Replicate										Cell Yield (x 10 000) Mean	Standard Deviation	CV (%)
(%)	1	2	3	4	5	6	7	8	9	10			
Control	51.50	38.00	59.50	45.00	–	–	51.50	53.00	46.00	34.50	46.32	8.23	17.76
0.195	–	–	–								–	–	–
0.39	–	–	–								–	–	–
0.78	–	–	–								–	–	–
1.56	–	–	–								–	–	–
3.13	–	–	–								–	–	–
6.25	88.50	64.00	70.00								73.11	12.77	17.47
12.5	86.00	70.50	60.00								71.11	13.08	18.39
25	76.00	59.00	75.50								69.11	9.67	14.00
50	60.50	74.50	87.50								73.11	13.50	18.47
100	99.50	82.00	80.50								86.27	10.56	12.24

"–" = not enumerated

NOTES : •Control replicates 5 and 6 used for pH measurement.

Test Data Reviewed By : HK
Date : 2007-01-09

REFERENCES

[a] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, USA.

<original signed by>

Date : 2007-01-25

Approved By : _____
Project Manager

CHAIN OF CUSTODY RECORD

Stantec

Stantec Work Order No:

Shipping Address: Stantec Consulting Ltd.
11B Nicholas Beaver Road, RR #3
Guelph, Ontario Canada N1H 6H9

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number:	
Field Sampler Name (print):	Jaime Hogan, Kelly Wells, John Moostoos
Signature:	Jaime Hogan
Affiliation:	Canada North Environmental Services
Sample Storage (prior to shipping):	Transported to Prince Albert from site (2h)
Custody Relinquished by:	Jaime Hogan
Date/Time Shipped:	January 3, 2007 / 1500

Client: Canada North Environmental Services (CanNorth)
4-130 Robin Crescent
Saskatoon, SK, S7L 6M7

Phone:	(306) 652-4432
Fax:	(306) 652-4431
Contact:	Jaime Hogan or Kelly Wells

Sample Identification					Analyses Requested										Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	Stantec Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Lemna minor* Growth	*Selenastrum capricornutum* Growth	RISS Data Entry	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2007-01-03	1230	WRS03	17672			✓		✓	✓	✓	✓	✓		✓		✓	46L + 2L +30L
2007-01-03	1130	MWS01	17673			✓		✓	✓	✓	✓	✓		✓		✓	46L + 2L +30L
		23L pails		12.0°C													
		10L bags		2.0°C													

2007-01-05

For Lab Use Only	
Received By:	P(Stantec)
Date:	2007-01-04
Time:	11:00
Storage Location:	
Storage Temp.(°C)	

Please list any special requests or instructions:

Contact Jaime on Thursday morning for details regarding changes to the standard dilution percentages for the above toxicity tests. Water quality parameters to be analysed as previously discussed with Keith; finalize these on Thursday as well.

Shipped three coolers and four buckets

*one cooler missing from shipment. Stantec personnel picked up missing piece at depot - 2007-01-04 JP.

APPENDIX C

STATION WRS-03

Stantec Consulting Ltd.
118 Nicholas Beaver Road RR3
Guelph ON N1H 6H9
Tel: (519) 763-4412 Fax: (519) 763-4419
stantec.com

Stantec

Work Order : 210742
Sample Number : 17672 WRS-03

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services		
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	WRS03	Time Collected :	12:30
Sampling Method :	Composite	Date Received :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Time Received :	11:00
Temp. on arrival :	2.0°C	Date Tested :	2007-01-05
Sample Description:	Clear, yellow, odourless.		
Test Method :	Test of Reproduction and Survival using the Cladoceran *Ceriodaphnia dubia*. Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/21 (as amended November 1997).		

TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
LC50 (Survival)	>100%	-	-
IC25 (Reproduction)	>100%	-	-

The results reported relate only to the sample tested.

SODIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2007-01-12	Statistical Method :	Linear Interpolation (Toxstat 3.5)[b]
Organism Batch :	Cd07-01	Historical Mean IC25 :	1.28 g/L
Test Duration :	7 days	Warning Limits (± 2SD) :	0.88 - 1.89
IC25 Reproduction :	1.17 g/L	Analyst(s) :	SM/NK
95% Confidence Limits :	0.81-1.37		

TEST CONDITIONS

Test Organism :	*Ceriodaphnia dubia*	Sample Filtration :	None
Organism Batch :	Cd07-01	Test Aeration :	None
Source :	Stantec In-house Culture	Control/Dilution Water :	Well water with 29.6 mg/L NaCl
Age (on Test Day 0) :	≤24 h (within 12 h of same age)	Test Volume per Replicate :	15 mL
Culture Mortality :	10 % (during previous 7 days)	Test Vessel :	22 mL polystyrene vial
Mean Young Produced :	≥ 15.0 (during previous 7 days)	Depth of Test Solution :	4.0 cm
Young Produced :	≥ 6.0 (previous brood)	Organisms per Replicate :	1
Ephippia in Culture :	None	Number of Replicates :	10
pH Adjustment :	None	Daily Renewal Method :	Transferred to fresh solutions
Hardness Adjustment :	None	Test Method Deviation(s) :	None

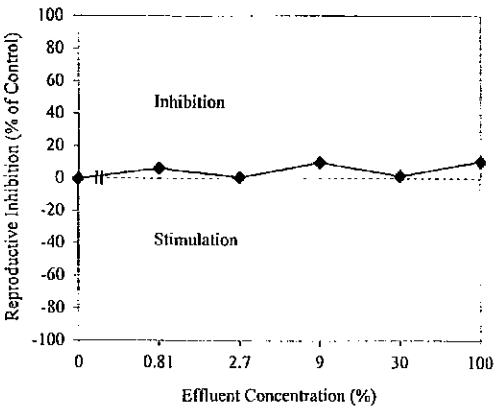
COMMENTS

All test validity criteria as specified in the test method cited above were satisfied.
No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

Work Order : 210742
Sample Number : 17672

SUMMARY OF TEST DATA

***Ceriodaphnia dubia* Reproductive Inhibition**



Total Neonates per Test Organism at Test Completion

	Effluent Concentration (%)					
Replicate	**Control**	**0.81**	**2.7**	**9**	**30**	**100**
1	33	28	33	34	34	32
2	37	35	31	29	33	32
3	31	26	30	31	34	32
4	36	29	35	31	37	21
5	33	35	36	34	34	34
6	32	34	34	16	35	32
7	30	32	29	32	37	25
8	36	29	34	32	32	32
9	34	36	36	28	28	25
10	35	32	37	37	28	37
Mean	33.7	31.6	33.5	30.4	33.2	30.2

Cumulative Daily Test Organism Mortality (%)

		Effluent Concentration (%)					
Date	**Test Day**	Control	0.81	2.7	9	30	100
2007-01-06	1	0	0	0	0	0	0
2007-01-07	2	0	0	0	0	0	0
2007-01-08	3	0	0	0	0	0	0
2007-01-09	4	0	0	0	0	0	0
2007-01-10	5	0	0	0	0	0	0
2007-01-11	6	0	0	0	0	0	0
2007-01-12	7	0	0	0	0	0	10
Total Mortality (%)		0	0	0	0	0	10

REFERENCES

[a] Stephan, C. E. 1977. Methods for calculating an LC50. pp 65-84 in : P. L. Mayer and J. L. Hamelink (eds.), Aquatic Toxicology and Hazard Evaluation. Amer. Soc. Testing and Materials, Philadelphia PA. ASTM STP 634.

[b] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

<original signed by>

Date : 2007-01-25

Approved By : Project Manager

Work Order : 210742
Sample Number : 17672

Ceriodaphnia dubia Survival and Reproduction

Test Initiation Date : 2007-01-05
Initiation Time : 15:40
Initiatied By : SM(RD)
Test Completion Date : 2007-01-12

Concentration (%)		Replicate										Mean	Analyst(s)
Control	Day	1	2	3	4	5	6	7	8	9	10	Young	
2007-01-06	1	0	0	0	0	0	0	0	0	0	0	0	RD
2007-01-07	2	0	0	0	0	0	0	0	0	0	0	0	RD
2007-01-08	3	0	0	0	0	0	0	0	0	0	0	0	RD
2007-01-09	4	4	4	6	6	6	5	3	5	4	5	4.8	KJ
2007-01-10	5	11	14	14	13	12	12	13	11	14	11	12.5	EJ
2007-01-11	6	0	0	0	0	0	0	0	0	0	0	0	KJ
2007-01-12	7	18	19	11	17	15	15	14	20	16	19	16.4	AS

Concentration (%)		Replicate										Mean
9	Day	1	2	3	4	5	6	7	8	9	10	Young
2007-01-06	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-07	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	3	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	4	8	4	5	5	5	4	4	6	3	6	5
2007-01-10	5	12	10	12	11	12	8	11	10	11	11	10.8
2007-01-11	6	0	0	0	0	0	0	0	0	0	0	0
2007-01-12	7	14	15	14	15	17	4	17	16	14	20	14.6

Concentration (%)		Replicate										Mean
0.81	Day	1	2	3	4	5	6	7	8	9	10	Young
2007-01-06	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-07	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	3	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	4	4	6	4	5	6	5	6	2	5	6	4.9
2007-01-10	5	10	11	10	9	13	13	12	10	15	11	11.4
2007-01-11	6	0	0	0	0	0	0	0	0	0	0	0
2007-01-12	7	14	18	12	15	16	16	14	17	16	15	15.3

Concentration (%)		Replicate										Mean
30	Day	1	2	3	4	5	6	7	8	9	10	Young
2007-01-06	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-07	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	3	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	4	7	3	6	7	5	6	8	5	5	6	5.8
2007-01-10	5	11	13	13	12	12	13	13	11	9	8	11.5
2007-01-11	6	0	0	0	0	0	0	0	0	0	0	0
2007-01-12	7	16	17	15	18	17	16	16	16	14	14	15.9

Concentration (%)		Replicate										Mean
2.7	Day	1	2	3	4	5	6	7	8	9	10	Young
2007-01-06	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-07	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	3	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	4	6	5	6	7	6	5	6	5	7	6	5.9
2007-01-10	5	11	11	10	12	12	13	9	11	12	13	11.4
2007-01-11	6	0	0	0	0	0	0	0	0	0	0	0
2007-01-12	7	16	15	14	16	18	16	14	18	17	18	16.2

Concentration (%)		Replicate										Mean
100	Day	1	2	3	4	5	6	7	8	9	10	Young
2007-01-06	1	0	0	0	0	0	0	0	0	0	0	0
2007-01-07	2	0	0	0	0	0	0	0	0	0	0	0
2007-01-08	3	0	0	0	0	0	0	0	0	0	0	0
2007-01-09	4	4	5	4	6	4	6	4	5	5	5	4.8
2007-01-10	5	13	12	12	15	14	10	14	13	12	13	12.8
2007-01-11	6	0	0	0	0	0	0	0	0	0	0	0
2007-01-12	7	15	15	16	0 x	16	16	7	14	8	19	12.6

"x" = adult mortality
"*" = accidental adult mortality

Data Reviewed By : JJ
Date : 2007-01-23

Work Order : 210742
Sample Number: 17672

Ceriodaphnia dubia Water Chemistry Data

Initial Chemistry:	Temp. (°C)	DO (mg/L)	pH	Conductivity (µmhos/cm)	Hardness (mg/L as $CaCO_3$)
	25.0	8.9	7.7	3340	420

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Effluent Sub-sample Used		1	1	1	2	2	3	3
Temperature (°C)		25.0	24.0	24.5	25.0	24.0	24.0	24.5
Dissolved Oxygen (mg/L)		8.9	9.3	9.1	9.5	9.7	9.9	10.3
Dissolved Oxygen % Sat.[1]		113	117	112	120	120	121	124
Pre-aeration Time (min)[2]		20	20	20	20	20	20	20
Analyst(s)	Initial	CT(RD)	CD(RD)	EW	CT(RD)	EJ	HR	JGG
	Final	CD(RD)	EW	CT(RD)	EJ	HR	JGG	NK
Control (0%)								
Temp. (°C)	Initial	24.0	24.0	25.0	25.0	24.0	25.0	25.0
	Final	25.0	25.0	24.5	25.0	24.0	24.5	24.5
DO % Sat.[1]	Initial	100	97	98	100	100	99	101
DO (mg/L)	Initial	8.1	7.9	7.9	7.8	8.0	7.9	8.3
	Final	7.0	7.1	6.8	6.8	7.2	7.1	6.8
pH	Initial	8.3	8.3	8.4	8.4	8.3	8.4	8.2
	Final	8.3	8.3	8.3	8.2	8.2	8.1	8.1
Cond. (µmhos/cm)	Initial	582	562	545	555	575	535	591
0.81 %								
Temp. (°C)	Initial	24.0	24.0	25.0	25.0	24.0	25.0	25.0
	Final	25.0	25.0	24.5	25.0	24.0	24.5	24.5
DO (mg/L)	Initial	7.7	8.0	8.1	7.9	7.8	8.2	8.3
	Final	7.0	7.2	6.6	6.7	7.0	6.9	6.9
pH	Initial	8.2	8.3	8.5	8.4	8.2	6.7	8.2
	Final	8.3	8.4	8.2	8.2	8.3	8.1	8.1
Cond. (µmhos/cm)	Initial	–	595	610	579	596	560	613
9 %								
Temp. (°C)	Initial	24.0	24.0	25.0	25.0	24.0	25.0	25.0
	Final	25.0	25.0	24.5	25.0	24.0	24.5	24.5
DO (mg/L)	Initial	7.8	8.0	8.2	8.0	8.0	8.3	8.3
	Final	7.2	7.3	6.5	7.0	6.9	6.4	6.5
pH	Initial	8.2	8.3	8.4	8.3	8.2	8.3	8.2
	Final	8.2	8.3	8.1	8.2	8.3	8.0	8.1
Cond. (µmhos/cm)	Initial	799	850	828	826	837	806	855
100 %								
Temp. (°C)	Initial	24.0	24.0	25.0	25.0	24.0	25.0	25.0
	Final	25.0	25.0	24.5	25.0	24.0	24.5	24.5
DO (mg/L)	Initial	8.4	8.6	8.3	8.3	8.6	8.8	8.8
	Final	7.1	6.8	6.7	–	7.2	6.7	6.0
pH	Initial	7.9	8.0	8.1	8.0	7.9	8.1	7.9
	Final	8.2	8.3	8.3	–	8.4	8.2	8.0
Cond. (µmhos/cm)	Initial	3350	3370	3350	3360	3350	3360	3350

"–" = not measured

[1] % saturation (adjusted for actual temperature and barometric pressure)

[2] ≤100 bubbles/minute

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stantec.com

Stantec

Work Order : 210742
Sample Number : 17672

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services		
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	WRS03	Time Collected :	12:30
Sampling Method :	Composite	Date Received :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Time Received :	11:00
Temp. on arrival :	2.0°C	Date Tested :	2007-01-05
Sample Description:	Clear, yellow, odourless.		
Test Method :	Test of Growth and Survival using fathead minnows. Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/22 (as amended November 1997).		

TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Growth)	>100%	-	-
LC50 (Survival)	>100%	-	-

The results reported relate only to the sample tested.

POTASSIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2007-01-02	Statistical Method :	Linear Interpolation (Toxstat 3.5)[b]
Organism Batch :	Fm07-01	Historical Mean IC25 :	0.86 g/L
Test Duration :	7 days	Warning Limits (± 2SD) :	0.65 - 1.16
IC25 Survival :	0.69 g/L	Analyst(s) :	SM/CT/EW/RD/KJ
95% Confidence Limits :	0.65 - 0.73		

TEST CONDITIONS

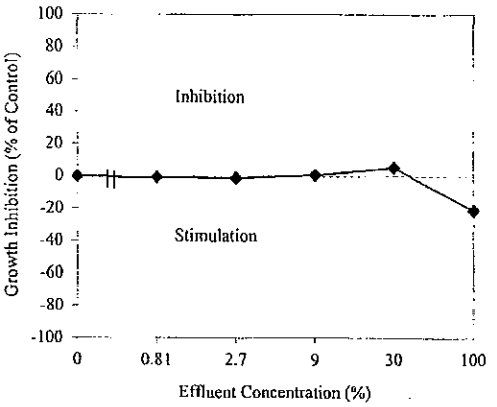
Test Organism :	*Pimephales promelas*	Test Type :	Static Renewal
Organism Batch :	Fm07-01	Control/Dilution Water :	Well water with 29.6 mg/L NaCl
Source :	Stantec In-house Culture	Test Volume / Replicate :	300 mL
Life Stage :	Larval (<24 h old)	Test Vessel :	420 mL polystyrene beaker
Culture Mortality :	0.1 % (previous 7 days)	Depth of Test Solution :	8 cm
pH Adjustment :	None	Organisms per Replicate :	10
Sample Filtration :	None	Number of Replicates :	3
Hardness Adjustment :	None	Daily Renewal Method :	80-85% syphoned and replaced
Test Aeration :	None	Test Method Deviation(s):	None

COMMENTS

All test validity criteria as specified in the test method cited above were satisfied.
No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

Work Order : 210742
Sample Number : 17672

Fathead Minnow Growth Inhibition



REFERENCES

[a] Stephan, C. E. 1977. Methods for calculating an LC50. pp 65-84 in : P. L. Mayer and J. L. Hamelink (eds.), Aquatic Toxicology and Hazard Evaluation. Amer. Soc. Testing and Materials, Philadelphia PA. ASTM STP 634.

[b] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

<original signed by>

Date : 2007-01-25

Approved By : _____
Project Manager

Work Order : 210742
Sample Number : 17672

Larval Fathead Minnow Mortality Data

Initiation Time (h)		Day 0 (Initiation)	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7 (Completion)		
15:40		2007-01-05	2007-01-06	2007-01-07	2007-01-08	2007-01-09	2007-01-10	2007-01-11	2007-01-12		
	Analyst(s):	KJ	RD	RD	KJ	CT(RD)	NK	EJ	CT(RD)		
Concentration (%)	Replicate	Mortality								Mean Mortality (%)	Standard Deviation
Control	A	0	0	0	0	0	0	0	1	6.7	0.58
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	1		
0.81	A	0	0	0	0	0	0	0	0	0.0	0.00
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	0		
2.7	A	0	0	0	0	0	0	1	1	3.3	0.58
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	0		
9	A	0	0	0	0	0	0	0	0	6.7	0.58
	B	0	0	0	0	0	0	1	1		
	C	0	0	0	0	0	0	0	1		
30	A	0	0	0	0	0	0	0	0	0.0	0.00
	B	0	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0	0		
100	A	0	0	0	0	0	0	0	0	6.7	0.58
	B	0	0	0	0	0	0	1	1		
	C	0	0	0	0	0	0	1	1		

Aberrant behaviour or swimming impairment : None

Larval Fathead Minnow Weight Data

Concentration (%)	Replicate	Number of Larvae Weighed	Mean Dry Weight of Larvae (mg)	Treatment Mean Dry Weight (mg)	Standard Deviation
Control	A	9	0.720	0.692	0.055
	B	10	0.629		
	C	9	0.728		
0.81	A	10	0.637	0.697	0.076
	B	10	0.782		
	C	10	0.671		
2.7	A	9	0.752	0.701	0.046
	B	10	0.664		
	C	10	0.687		
9	A	10	0.702	0.687	0.065
	B	9	0.742		
	C	9	0.616		
30	A	10	0.564	0.656	0.086
	B	10	0.733		
	C	10	0.672		
100	A	10	0.796	0.838	0.067
	B	9	0.916		
	C	9	0.803		

Data Reviewed By: JS
Date : 2007-01-23

Work Order : 210742
Sample Number: 17672

Fathead Minnow Water Chemistry Data

Initial Chemistry:	Temp. (°C)	DO (mg/L)	pH	Conductivity (µmhos/cm)	Hardness (mg/L as $CaCO_3$)
	25.0	8.9	7.7	3340	420

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Effluent Sub-sample Used		1	1	1	2	2	3	3
Temperature (°C)		25.0	24.0	24.5	25.0	24.0	24.0	24.5
Dissolved Oxygen (mg/L)		8.9	9.3	9.1	9.5	9.7	9.9	10.3
Dissolved Oxygen % Sat.[1]		113	117	112	120	120	121	124
Pre-aeration Time (min)[2]		20	20	20	20	20	20	20
Analyst(s) :	Initial	CT(RD)	CD(RD)	EW	CT(RD)	EJ	HR	JGG
	Final	CD(RD)	EW	CT(RD)	EJ	HR	CT(RD)	NK
Control (0%)								
Temp.(°C)	Initial	24.0	24.0	25.0	25.0	24.0	25.0	25.0
	Final	25.0	25.0	25.0	25.0	25.0	24.5	24.5
DO % Sat.	Initial	100	97	98	100	100	99	101
DO (mg/L)	Initial	8.1	7.9	7.9	7.8	8.0	7.9	8.3
	Final	7.4	6.4	6.7	6.9	7.5	6.6	6.9
pH	Initial	8.3	8.3	8.4	8.4	8.3	8.4	8.2
	Final	8.4	8.2	8.3	8.2	8.3	8.1	8.2
Cond. (µmhos/cm)	Initial	582	562	545	555	575	535	591
0.81 %								
Temp.(°C)	Initial	24.0	24.0	25.0	25.0	24.0	25.0	25.0
	Final	25.0	25.0	25.0	25.0	25.0	24.5	24.5
DO (mg/L)	Initial	7.7	8.0	8.1	7.9	7.8	8.2	8.3
	Final	7.3	6.2	6.3	7.3	7.4	6.9	6.6
pH	Initial	8.2	8.3	8.5	8.4	8.2	6.7	8.2
	Final	8.3	8.2	8.1	8.2	8.3	8.0	8.1
Cond. (µmhos/cm)	Initial	–	595	610	579	596	560	613
9 %								
Temp.(°C)	Initial	24.0	24.0	25.0	25.0	24.0	25.0	25.0
	Final	25.0	25.0	25.0	25.0	25.0	24.5	24.5
DO (mg/L)	Initial	7.8	8.0	8.2	8.0	8.0	8.3	8.3
	Final	7.4	6.6	6.6	7.2	7.6	7.0	6.8
pH	Initial	8.2	8.3	8.4	8.3	8.2	8.3	8.2
	Final	8.3	8.3	8.2	8.3	8.3	8.1	8.2
Cond. (µmhos/cm)	Initial	799	850	828	826	837	806	855
100 %								
Temp.(°C)	Initial	24.0	24.0	25.0	25.0	24.0	25.0	25.0
	Final	25.0	25.0	25.0	25.0	25.0	24.5	24.5
DO (mg/L)	Initial	8.4	8.6	8.3	8.3	8.6	8.8	8.8
	Final	7.5	7.4	6.7	7.0	7.4	7.0	6.8
pH	Initial	7.9	8.0	8.1	8.0	7.9	8.1	7.9
	Final	8.3	8.3	8.2	8.3	8.3	8.1	8.1
Cond. (µmhos/cm)	Initial	3350	3370	3350	3360	3350	3360	3350

"–" = not measured

[1] % saturation (adjusted for actual temperature and barometric pressure)

[2] ≤100 bubbles/minute

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Work Order : 210742
Sample Number : 17672

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services		
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	WRS03	Time Collected :	12:30
Sampling Method :	Composite	Date Received :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Time Received :	11:00
Temp. on arrival :	2.0°C	Date Tested :	2007-01-05
Sample Description:	Clear, yellow, odourless.		
Test Method :	Test for Measuring the Inhibition of Growth using the Freshwater Macrophyte, *Lemna minor*. Method Development and Application Section, Environmental Technology Centre, Environment Canada. Ottawa, Ontario. Report EPS 1/RM/37.		

TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Weight)	>97.0%	-	-
IC25 (Frond Production)	>97.0%	-	-

The results reported relate only to the sample tested.

POTASSIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2006-12-22	Statistical Method :	Linear Interpolation (Toxstat 3.5)[a]
Organism Batch :	Lm06-12	Historical Mean IC25 :	2.32 mg/L
Test Duration :	7 days	Warning Limits (± 2SD) :	1.35 - 4.09
IC25 (Frond Production) :	1.95 g/L	Analyst(s) :	HR/NK
95% Confidence Limits :	1.18 - 2.40		

TEST CONDITIONS

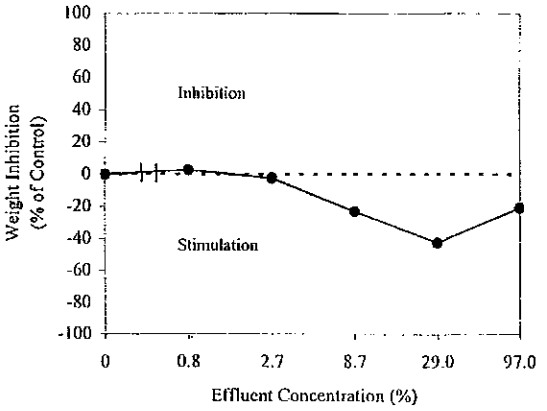
Test Organism :	*Lemna minor* L., Strain 7730	Test Type :	Static (no sub-samples required)
Organism Batch :	Lm06-12	Control/Dilution Medium :	Modified APHA
Culture Origin :	UTCC 492	Medium Preparation Water :	Millipore Milli-Q
Test Organism Source :	Axenic in-house culture	Source of Water :	University of Guelph, Guelph ON
Age (on Test Day 0) :	10 days	Medium Preparation Chemicals :	Modified APHA stocks A, B,C (10 mL/L)
Health Criteria (in APHA) :	8.2-fold frond increase in 7 days	Nutrient Spiking of Sample :	Modified APHA stocks A, B,C (10 mL/L)
Organism Acclimation :	20:55 h in APHA medium	Replicates per Concentration :	3
Inoculum (Test Day 0) :	2 plants (3 fronds per plant)	Test Volume per Replicate :	100 mL
Sample Filtration :	1 µm (Whatman GF/C)	Test Vessel :	250 mL glass Erlenmeyer flask
Sample Pre-aeration :	20 min. at ≤100 bubbles/min.	Depth of Test Solution :	4.0 cm
pH Adjustment :	None	Photoperiod/Light Intensity :	Continuous, 4204 - 4568 lux
Hardness Adjustment :	None	Test Method Deviation(s) :	None

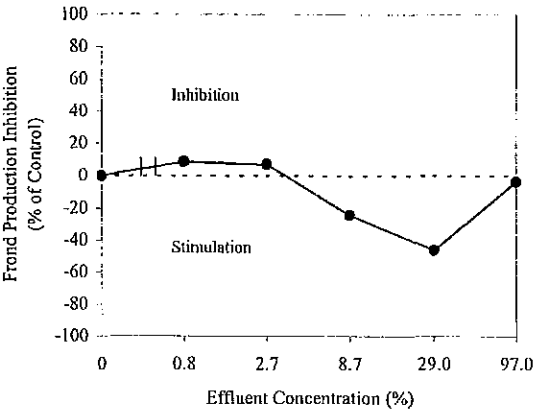
COMMENTS

•All test validity criteria as specified in the test method cited above were satisfied.

Work Order : 210742
Sample Number : 17672

Lemna minor Growth Inhibition





TEST MONITORING

Initiation Date : 2007-01-05
Intitiation Time : 13:45
Initiated By : HR

Termination Date : 2007-01-12
Termination Time : 13:45
Terminated By : KJ(HR)

Temperature Monitoring

Test Day	Date	Temperature (°C)
0 (unmodified sample)	2007-01-05	25.0
0	2007-01-05	24.5
1	2007-01-06	24.5
2	2007-01-07	24.5
3	2007-01-08	24.5
4	2007-01-09	24.5
5	2007-01-10	24.5
6	2007-01-11	25.0
7	2007-01-12	24.5

pH Monitoring

Concentration (%)	Day 0	Day 7
100 (unmodified sample)	7.8	–
Control	8.2	8.2
0.8	8.2	8.3
2.7	–	–
8.7	8.2	8.4
29.0	–	–
97.0	8.1	8.8

"–" = not required

REFERENCES

[a] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

<original signed by>

Date : 2007-01-25

Approved By:

Project Manager

Stantec

Work Order : 210742
Sample Number : 17672

Lemna minor Frond Increase

Concentration (%)	Replicate	Frond Count Day 0*	Frond Count Day 7	Frond Increase	Mean Frond Increase	Standard Deviation	CV (%)	Frond/Root Appearance (Day 7)
Control	A	6	51	45	45.7	3.1	6.7	Fronds healthy, appearance normal in all replicates.
	B	6	55	49				
	C	6	49	43				
0.8	A	6	50	44	41.7	2.5	6.0	Fronds healthy, appearance normal in all replicates.
	B	6	45	39				
	C	6	48	42				
2.7	A	6	38	32	42.3	11.7	27.6	Fronds healthy, appearance normal in all replicates.
	B	6	46	40				
	C	6	61	55				
8.7	A	6	64	58	56.7	4.2	7.3	Fronds healthy, appearance normal in all replicates.
	B	6	66	60				
	C	6	58	52				
29.0	A	6	79	73	66.7	8.5	12.8	Fronds healthy, appearance normal in all replicates.
	B	6	76	70				
	C	6	63	57				
97.0	A	6	47	41	47.3	6.0	12.7	Fronds healthy, appearance normal in all replicates.
	B	6	59	53				
	C	6	54	48				

NOTES: * No unusual appearance or treatment of culture prior to testing. Test inoculated with healthy plants.
- A 8.6-fold increase in frond number was observed in the control over the testing period.
- Light brown debris was observed at the bottom of the flasks in all concentrations. KJ

Lemna minor Frond Weight Data

Concentration (%)	Replicate	Dry Weight of Fronds (mg)	Mean Treatment Dry Weight (mg)	Standard Deviation
Control	A	4.99	5.28	0.68
	B	6.06		
	C	4.79		
0.8	A	5.26	5.15	0.12
	B	5.03		
	C	5.15		
2.7	A	4.94	5.42	0.44
	B	5.50		
	C	5.81		
8.7	A	7.49	6.49	0.98
	B	6.45		
	C	5.53		
29.0	A	7.80	7.53	0.45
	B	7.77		
	C	7.01		
97.0	A	6.01	6.38	0.50
	B	6.94		
	C	6.18		

Test Data Reviewed By : HC
Date : 2007-01-17

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Work Order : 210742
Sample Number : 17672

SAMPLE IDENTIFICATION

Company :	Canada North Environmental Services		
Location :	Saskatoon, SK	Date Collected :	2007-01-03
Substance :	WRS03	Time Collected :	12:30
Sampling Method :	Composite	Date Received :	2007-01-04
Sampled By :	J. Hogan/K. Wells/J. Moostoos	Time Received :	11:00
Temp. on arrival :	2.0°C	Date Tested :	2007-01-05
Sample Description:	Clear, yellow, odourless.		
Test Method :	Growth Inhibition Test Using the Freshwater Alga *Selenastrum capricornutum*. Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/25 (as amended November 1997).		

TEST RESULTS*

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Growth)	>100%	-	-

The results reported relate only to the sample tested.

SODIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2007-01-16	Statistical Method :	Linear Interpolation (Toxstat 3.5)[a]
Organism Batch :	Sel07-01	Historical Mean IC25 :	576.7 mg/L
Test Duration :	72 hours	Warning Limits (± 2SD) :	275.5 - 1233.0
IC25 Growth :	389.9 mg/L	Analyst(s) :	HR
95% Confidence Limits :	340.3 - 490.6		

TEST CONDITIONS

Test Organism :	*Selenastrum capricornutum*	Control/Dilution Water :	Millipore Milli-Q (no chemicals added)
Organism Batch :	Sel07-01	Test Vessel :	U-shaped polystyrene microplate
Strain Number :	UTCC37	Volume per Replicate :	220 µL
Source :	Stantec In-house Culture	Number of Control Replicates:	10
Age (on Test Day 0) :	4 days (in logarithmic growth)	Number of Test Replicates :	3
pH Adjustment :	None	Concentrations Tested :	10 + Control
Hardness Adjustment :	None	Photoperiod / Light Intensity :	Continuous light, 3995 - 4022 lux
Sample Pre-aeration :	None	Mean Test Temperature (± SD):	24.9°C (± 0.3)
Sample Filtration :	0.45 µm preconditioned filter	Test Duration :	72 hours
Volume Filtered:	≥10 mL	Test Method Deviation(s) :	None

COMMENTS

*Results do not incorporate the 0.9091dilution factor incurred by the addition of enrichment medium and algal inoculum.
•All test validity criteria as specified in the test method cited above were satisfied.
•No unusual appearance or treatment of culture prior to testing.

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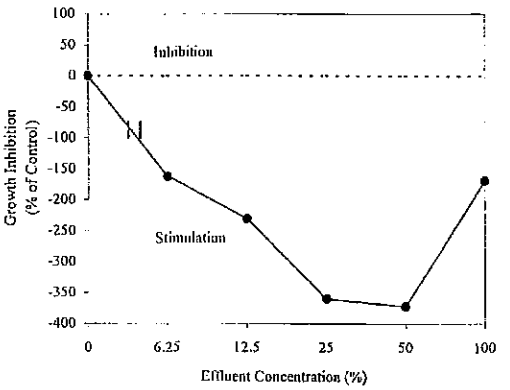
Work Order : 210742
Sample Number : 17672

***Selenastrum capricornutum* Growth Inhibition**



Cell Enumeration at 72-hours

Initiation Date :	2007-01-05	Sample pH (at 0 hours) :	7.8
Initiated By :	AS/HR	Control pH (at 0 hours) :	6.5
Completion Date :	2007-01-08	Control pH (at 72 hours) :	6.5
Enumerated By :	KJ(HR)	Initial Algal Inoculum :	1.0591 cells/mL (x 10 000)
Enumeration Technique :	Manual (hemocytometer)	Inoculum Prepared :	00:30 h prior to test initiation

Concentration	Cell Concentration (x10 000) Replicate										Cell Yield (x 10 000)		
(%)	1	2	3	4	5	6	7	8	9	10	Mean	Standard Deviation	CV (%)
Control	48.00	45.50	39.00	42.50	–	–	49.00	39.00	51.00	45.50	43.88	4.47	10.18
0.195	–	–	–								–	–	–
0.39	–	–	–								–	–	–
0.78	–	–	–								–	–	–
1.56	–	–	–								–	–	–
3.13	–	–	–								–	–	–
6.25	102.00	111.50	134.50								114.94	16.71	14.54
12.5	155.50	158.00	125.00								145.11	18.37	12.66
25	232.00	194.50	182.50								201.94	25.82	12.79
50	245.50	198.50	181.00								207.27	33.36	16.09
100	145.00	104.00	108.00								117.94	22.61	19.17

"–" = not enumerated

NOTES : •Control replicates 5 and 6 used for pH measurement.

Test Data Reviewed By : HL
Date : 2007-01-09

REFERENCES

[a] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, USA.

<original signed by>

Date : 2007-01-25

Approved By : Project Manager

CHAIN OF CUSTODY RECORD

Stantec

Stantec Work Order No:

Shipping Address: Stantec Consulting Ltd.
11B Nicholas Beaver Road, RR #3
Guelph, Ontario Canada N1H 6H9

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number:	
Field Sampler Name (print):	Jaime Hogan, Kelly Wells, John Moostoos
Signature:	Jaime Hogan
Affiliation:	Canada North Environmental Services
Sample Storage (prior to shipping):	Transported to Prince Albert from site (2h)
Custody Relinquished by:	Jaime Hogan
Date/Time Shipped:	January 3, 2007 / 1500

Client: Canada North Environmental Services (CanNorth)
4-130 Robin Crescent
Saskatoon, SK, S7L 6M7

Phone: (306) 652-4432
Fax: (306) 652-4431
Contact: Jaime Hogan or Kelly Wells

Sample Identification					Analyses Requested										Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	Stantec Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Lemna minor* Growth	*Selenastrum capricornutum* Growth	RISS Data Entry	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2007-01-03	1230	WRS03	17672			✓		✓	✓	✓	✓	✓		✓		✓	46L + 2L +30L
2007-01-03	1130	MWS01	17673			✓		✓	✓	✓	✓	✓		✓		✓	46L + 2L +30L
		23L pails		12.0°C													
		10L bags		2.0°C													

2007-01-05

For Lab Use Only	
Received By:	P (Stantec)
Date:	2007-01-04
Time:	11.00
Storage Location:	
Storage Temp.(°C)	

Please list any special requests or instructions:

Contact Jaime on Thursday morning for details regarding changes to the standard dilution percentages for the above toxicity tests. Water quality parameters to be analysed as previously discussed with Keith; finalize these on Thursday as well.

Shipped three coolers and four buckets

*one cooler missing from shipment. Stantec personnel picked up missing piece at door. 2007-01-04 AP.