RM OF EAST ST. PAUL

December 2019

Surface Water Quality Monitoring Report 2019 (Silver Springs Park)

CLIMATE CHANGE ADAPTATION

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EXECUTIVE SUMMARY

The purpose of East St. Paul's 2019 water quality monitoring program was to investigate areas of concern in the ponds of Silver Springs Park, related to water quality, water levels, and aquatic plant growth. The program occurred in order to identify and assess mitigation measures and create a baseline to monitor against future conditions.

The water sampling program occurred between June 13th 2019 and September 19th, 2019. Field measurements of pH, water temperature, dissolved oxygen (DO), and conductivity were collected using a SENSION+ M150 portable water quality meter. Further samples were sent to a Canadian Association for Laboratory Accreditation (CALA) accredited analytical laboratory (ALS Laboratories, Winnipeg, MB) to be analyzed for nitrate + nitrite (NO_3 + NO_2), ammonia (NH_3), chlorophyll *a*, total phosphorous (TP), total suspended solids (TSS), and turbidity, and in some cases, fecal matter, total chlorine (TCl) and algae identification. Results reflected seasonal changes, including temperature, moisture, and other weather conditions, as well as nutrient inputs.

Results were communicated to the public halfway through the sampling season during the Open House that occurred on August 20th, 2019, and then further summarized in the Open House report that was published in September 2019.

Data collected during the sampling program was analyzed and used to develop recommendations on opportunities to improve water quality conditions. Future sampling programs will reference the baseline data to verify findings and assess the impact of implemented mitigation measures.

Surface Water Quality Monitoring Report 2019 (Silver Springs Park)

1 INTRODUCTION

Purpose

The purpose of East St. Paul's 2019 water quality monitoring program was to investigate sources of water quality concerns in the ponds within the former quarry at Silver Springs Park, in order to identify and assess mitigation measures and create a baseline to monitor against future conditions.

Background

The ponds that currently exist in Silver Springs Park were originally formed during limestone quarrying activities, with groundwater and limited surface water runoff filling the low lying areas of the site. In the 1980s, the quarry began to decrease operation and restoration of the quarry side slopes was initiated to create a park overlooked by housing development. The east side of the site was reopened in the 1990s to remove residual granular materials. There are four separate waterbodies in the park. The separation of the ponds follows the high areas that were used as excavation platforms or access roads by excavating equipment during quarrying activities. These were later used as the base to create recreational pathways as part of the landscape master plan for the park.[1] Already in the 1990s varying surface water levels of up to 0.5 meters were measured between the ponds, indicating a certain degree of isolation between the systems. During a series of high water years, the pathways were further elevated to create permanent barriers between the ponds.[2]

The ponds are fed by groundwater, and to a lesser extent runoff.

Historic Water Quality Observations

Residents report that the ponds were a clear blue colour in the late 1990s and that locals frequently used the ponds for swimming. Feedback from residents indicates that water quality began making a visible shift within the last 10 years[3], although air photos from 2000 suggest this change started several years prior.[4] Residents raised concerns about changes in water quality and beginning in 2016, the RM began working with Clean Water Pro in order to look opportunities to improve water quality.

Historic Management Efforts

In August 2016, fine bubble aeration using six ProAir4 plates were installed in the NW corner of SS B. In September 2018, an assessment of all four ponds in Silver Springs was conducted by Clean Water Pro. The assessment concluded that all four ponds had adequate dissolved oxygen levels in the pond, which is the primary purpose of aeration.

[1] (McGowan Design Group, 1991)
[2] (Toews, 2019, pers comm.)
[3] (RM ESP, 2019)
[4] (Atlas Geomatics, 2000)

Description of Waterbodies

The four ponds vary in depth and water levels fluctuate, with low levels being observed in dry years.[5] The ponds range in depth from approximately one to ten feet however fluctuate in response to changes to the water table. Residents have advised that in the dry years of the early 1990s, water levels in the park were very low. Groundwater infiltration has been observed in Ponds A and C in the winter from areas that do not freeze over.

The four ponds currently have distinct water quality from each other and the aquatic vegetative communities within the ponds vary substantially.

Silver Springs A (SS A)

SS A is a 15.4-acre pond. The pond is surrounded by steep gravel slopes on the south, trees and grassland to the west of the pond, as well as a few residential properties at the top of the hillside. There are hiking trails located on the east side of the pond. SS A has high levels of brown algae and some cyanobacteria species present. Initially, Pond A was the deepest; however, it is believed that erosion of the steep south banks contributed substantial sedimentation which resulted in decreased depth.

Silver Springs B (SS B)

SS B is a 26-acre pond. SS B is surrounded by residential properties on its north and east sides, as it lies at the base of properties on Silver Fox Place, Ridgeview Place, and Highfield Place. Aquatic vegetation is growing in the form of submerged aquatic plants.

Silver Springs C (SS C)

SS C is a 25.16-acre pond. The majority of SS C is bordered by grassland and deciduous trees; however, there are some residential properties on the hill on its west side. SS C has high levels of green algae and the presence of some cyanobacteria (blue green) algae species.

Silver Springs D (SS D)

SS D is the smallest pond at 6.81 acres in size and is also notably shallower than the other three ponds. The majority of the pond is bordered by grassland or forested areas; however, some residential properties are present on the north side, up the hill. SS D has a mixture of both algae and submerged aquatic plants.

[5] (RM ESP, 2019)

Table 1. *Summary of Visual Observations*

Location	Algae	Aquatic Vegetation	Odour	Suspended Sediment	Wildlife	Other Notes
SS A	High levels of brown algae		√	High levels	Geese, Ducks, Turtles, Muskrat, Frogs, Minnows	Brown opaque water
SS B		High levels of submerged aquatic vegetation		Low levels	Geese, Ducks, Turtles, Frogs, Minnows	Blue clear water
SS C	High levels of green algae		√	Low levels	Geese, Ducks, Turtles, Muskrat, Frogs, Minnows	Blue-green opaque water
SS D		Moderate levels of submerged aquatic vegetation		Moderate levels	Geese, Ducks, Turtles, Frogs	Clear water

2 METHODOLOGY

Sample Locations

Silver Springs water quality sampling occurred at four locations; one for each of the four ponds designated as SS A, SS B, SS C, and SS D.

Figure 1. *Sampling Locations in Silver Springs Park.*

Sampling Protocol and Analysis

Ponds were accessed from the shoreline and water samples were collected using a sampling pole (i.e., a clean bucket attached to a long pole) in order to retrieve water from the water column. Sample water was composited in a larger (clean) bucket on the shore; the composite water was then used to collect readings with the portable water quality meter and to fill sample bottles for submission to the analytical laboratory. Sample dates and times were recorded at every site. Samples were sent to a Canadian Association for Laboratory Accreditation (CALA) accredited analytical laboratory (ALS Laboratories, Winnipeg, MB). Lab samples were kept cool and in the dark until submission to the laboratory. Laboratory samples were analyzed for nitrate + nitrite (NO_3 + NO_2), ammonia (NH_3),chlorophyll *a*, total phosphorous (TP), total suspended solids (TSS), and turbidity; in some cases, fecal matter, total chlorine (TCl) and algae identification were also assessed.

Field measurements of pH, water temperature, dissolved oxygen (DO), and conductivity were collected using a SENSION+ M150 portable water quality meter. The meter was calibrated in the office prior to each sampling event.

Prior to assessing the results, the field and laboratory data were reviewed for potential outliers and transcription or analytical errors. Any laboratory results that were reported below the analytical detection limit were included in the analyses at the value equal to the detection limit.

Sampling Dates and Parameters

Table 2. Sampling Dates

Full Parameter Sampling	**Lab Results Received**
June 19th	June 27th
June 26th	July 19th
July 11th	July 24th
July 24th	August 7th
August 7th	August 21st
August 29th	September 9th
September 19th	October 19th
Limited Parameter Sampling	
July 17th	
August 1st	
August 14th	
August 21st	

Limited parameters (pH, DO, temperature, and conductivity) with the portable meter were measured weekly at each pond in July and August. In addition, a full set of parameters were monitored in each pond approximately every two weeks. On these sampling dates, both meter readings (pH, DO, temperature, conductivity) and lab analysis samples (nitrates + nitrites, ammonia, chlorophyll *a*, total phosphorous, total suspended solids, and turbidity) were collected. DO was also measured at the laboratory six times through the summer to check the accuracy of readings from the water quality meter; all results indicated that the water quality meter was reading accurately. Based on information collected during the sampling process, additional samples (Fecals, algae, total chlorine) were occasionally collected from specific waterbodies.

Water quality results were compared to the Manitoba Water Quality Standards, Objectives and Guidelines (2011)[6] as well as the Canadian Council for Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life (PAL)[7] in cases where a provincial guideline needed further clarification. Objectives and guidelines for the Protection of Aquatic Life (PAL) are the primary focus, although drinking water and recreational use objectives/guidelines were also considered for perspective.

Table #3 summarizes the parameters measured during the monitoring program, including the rationale for its inclusion in the program, and lists the objective/guidelines, where applicable. Further description of select parameters follows.

[6] (Manitoba Water Stewardship, 2011)
[7] (CCME, 2011).

Table 3. Summary of Parameters

Parameter Name	Analysis Method	Units	MB Objectives /Guidelines	Type of Objective or Guideline	Description
pH	Portable Meter	units	6.5-9	Guideline for PAL[8]	Indicator of relative alkalinity or acidity of water
Water Temperature	Portable Meter	°C			Suitability for Aquatic Life
Dissolved Oxygen (DO)	Portable Meter/ Lab Analysis	mg/L	Minimum 6.5	Objective for PAL	Available oxygen in water
Conductivity	Portable Meter	µS/cm			Can indicate if a pollutant has entered the waterbody/presence or absence of groundwater
Nitrate + Nitrites ($NO_3 + NO_2$)	Lab Analysis	mg/L	10	Objective for Drinking Water [9]	Nutrient
Nitrate (NO_3)	Lab Analysis	mg/L	2.93[10]	Guideline for PAL	Nutrient
Nitrite (NO_2)	Lab Analysis	mg/L	0.06	Guideline for PAL	Nutrient
Ammonia (NH3)	Lab Analysis	mg/L	Dependent on pH and water temperature	Objective for PAL	Nutrient, can be toxic at high levels
Total Phosphorous (TP)	Lab Analysis	mg/L	0.025	Narrative guideline to prevent the growth of nuisance algae	Nutrient
Total Chlorine (TCl)	Lab Analysis	mg/L	0.011		Can be discharged from swimming pools- toxic to aquatic life at small quantities
Chlorophyll A	Lab Analysis	mg/L			Indicator of plant growth
Total Suspended Solids (TSS)	Lab Analysis	mg/L			Particles in water column; high TSS impairs foraging and predator avoidance behaviours
Turbidity	Lab Analysis	NTU			Relative clarity of water, how much material suspended in water decreases light passage in water[11]
Fecal Bacteria	Lab Analysis	CFU/100 mL	200	Objective for Human Recreation	Indicator of fecal contamination
Cyanobacteria	Lab Analysis	cells/1 mL	100,000	Objective for Human Recreation	Indicator of eutrophication in waterbodies

[8] PAL = Protection of Aquatic Life

[9] Drinking water objectives are not directly applicable, however used for perspective

[10] MB water quality states guideline as 13mg/L as N; however, it was confirmed by Province to be "13 mg/L as NO_3", which is equivalent to 2.93 mg/L as N.

[11] (Ohrel, R. L., & Register, K. M, 2006).

pH

pH is used to specify the alkalinity or acidity of a solution by measuring the hydrogen ion concentration. pH directly affects aquatic life and organisms become stressed and when the pH of water is too low or high it can highly impair or have lethal consequences for individual species. pH also impacts toxicity and solubility of various chemicals or heavy metals in water, one example of this being ammonia. Excessively high or low pH levels can also cause skin and eye irritations for humans, which could be a concern for individuals using the ponds for recreation. [14]

Dissolved oxygen

Dissolved oxygen (DO) is an important water quality indicator of a waterbody's ability to support aquatic life, as DO levels below a certain threshold can cause lethal effects on aquatic organisms. DO enters the water from two main sources- the atmosphere and aquatic plants. DO enters the water by diffusion through the atmosphere. Algae and submerged plants produce oxygen through photosynthesis and release it into the pond water. DO is affected by temperature and fluctuates throughout the day. Higher temperatures usually result in higher plant decomposition which can contribute to elevated DO concentration. Aeration also increases DO levels as bubbles produced by the moving water supply oxygen. Fish and aquatic animals rely on dissolved oxygen to survive, and decreasing oxygen levels puts aquatic life under stress. The overabundance of algae and other aquatic plants can deplete DO to levels below the PAL threshold. When algae blooms die-off, they can cause rapid oxygen depletions since DO is consumed by bacteria and fungi as they decompose dead organic matter. [15] Dissolved oxygen levels are also impacted by water flow, as higher flow rates increase turbulence and diffusion of atmospheric oxygen into the water, which will result in increased DO concentrations.

Nutrients

Nitrogen and Phosphorous are important naturally occurring and are the principle drivers for productivity in aquatic ecosystems. They can enter the aquatic environment through various human inputs, the most common being runoff from fertilized agricultural areas or lawns. They support the growth of aquatic vegetation including floating vegetation, submerged plants, macrophytes and emergent plants. However, excess nitrogen and phosphorus can result in nutrient pollution which may cause aquatic vegetation like algae to grow at rates higher than what can be supported naturally from the ecosystem. Eutrophication occurs when excessively high nutrient conditions result in excessive algal blooms and vegetation growth. [16] Excessive algae or plant growth will eventually die off. Oxygen-consuming bacteria will decompose dead aquatic vegetation, depleting available oxygen which is needed by aquatic life to survive.[17] There have also been studies that suggest that goose fecal matter can contribute to nutrient loading as it contains nitrogen and phosphorous. [18] The presence of large amounts of geese may result in higher nutrient levels.

Although the Manitoba Water Quality Standards, Objectives and Guidelines (2011) provides guideline values for phosphorous, the CCME provides trigger ranges for phosphorous concentration in order to classify waterbodies by trophic status and the tendency towards eutrophication.

[14] (Health Canada, 2012)
[15] (Ohrel, R. L., & Register, K. M, 2006).
[16] Ibid
[17] Ibid
[18] (Dessborn, L., Hessel, R., & Elmberg, J., 2016)

Table 4. Total Phosphorous Trigger ranges for Canadian lakes and Rivers. Adapted from Phosphorus: Canadian Guidance Framework for the Management of Freshwater Systems [19]

Trophic Status	Canadian Trigger Ranges Total Phosphorous (mg/L)
Ultra-oligotrophic	<0.004
Oligotrophic	0.004-0.01
Mesotrophic	0.01-0.02
Meso-eutrophic	0.02-0.035
Eutrophic	0.035-0.100
Hyper-Eutrophic	> 0.100

The proposed provincial guideline value of 0.025 mg/L of phosphorous would indicate a water body is meso-eutrophic, meaning the waterbody's biological productivity is moderate to high. Exceeding this level would indicate high biological activity within a waterbody due to excessive nutrients, and eutrophic conditions which could be detrimental to ecosystem health.

Ammonia is highly dependent on a variety of factors, the main being temperature and pH of the particular waterbody, although it can also be impacted by other factors including dissolved oxygen concentration and salinity. It can enter the environment through either natural processes, such as the breakdown of organic or animal waste, forest fires, and gas exchange in the atmosphere, as well as point sources such as emissions and effluent material from industrial plants or agricultural facilities.[20] At high concentrations, ammonia can be toxic to aquatic organisms; however, there is no uniform guideline value for ammonia toxicity because of its variability depending on other factors such as pH, temperature and occurring biological activity. For the purpose of this study, the referenced guideline value for ammonia was determined using the most stringent conditions by using the highest pH and temperature measured in each pond during the summer (i.e., conditions when ammonia would be most toxic). If the reference guideline was exceeded, then analysis of the guideline for the specific sample was calculated relative to the relevant factors.

Aquatic vegetation

Ponds within the municipality have various types of aquatic vegetation, whether it be algae, duckweed, aquatic weeds, and/or emergent macrophytes, with often one or two types of aquatic vegetation dominating. Aquatic vegetation is highly receptive to the concentration of nutrients available in the water. If there are excess nutrients available in the pond ecosystem, the abundance of aquatic vegetation will increase.

Algae

Algae are a group of diverse aquatic organisms. Typically, algae are identified as green plants that clump together to cover the water surface in a mat-like manner; however, algae can be blue, green, brown or even red and take many different forms. Algae are sometimes stringy and can extend into the water column. Algae provides numerous benefits to aquatic ecosystems when present at healthy levels. It can serve as a food source for fish, waterfowl and other animals. It also produces oxygen in the water through photosynthesis and absorbs nutrients such as nitrogen and phosphorous from the water while

[19] (CCME, 2004)
[20] (CCME, 2010)

it grows. However, excessive vegetation growth, such as algae blooms in the pond system is usually indicative of high nutrient levels. When large amounts of algae (or other vegetation) die off, oxygen levels typically decline. Some forms of algae, such as cyanobacteria, also known as blue-green oxygen algae can present a threat to human health. Certain species of cyanobacteria, the most common being *Anabaena, Aphanizomenon, Cylindrospermopsis, Microcystis, Nodularia* and *Planktothrix* are capable of releasing toxins during decomposition or during periods of limited nutrients.[21] Even though certain species are capable of producing toxins, the formation of toxic cells is unpredictable and factors responsible are not completely understood.[22] Lakes containing cyanobacteria may never form toxic blooms, or form toxic blooms once and never again. Contact with waters that may contain cyanobacterial blooms should be avoided. The most frequent reported symptoms are skin irritation and gastrointestinal symptoms.[23]

Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) or seagrasses refer to rooted aquatic plants that grow throughout the water column and blanket the SAV provide habitat and shelter for many aquatic organisms, as well as serve as a food source for some species. Their root systems can help stabilize the shoreline from erosion. SAV increases oxygen in the water through the process of photosynthesis and contributes to a healthy aquatic ecosystem. The root systems of SAV blanket the pond base, and therefore disruption or loss of the vegetation bed can result in detrimental effects in the pond ecosystem. [24] Removal of SAV can result in overload of nutrients such as nitrogen and phosphorous, making the pond system susceptible to algal blooms.[25] Nutrients and suspended sediments that are tangled within the plant leaves and roots may be also released.[26] Dissolved oxygen levels may decrease due to loss of oxygen generated by photosynthesis.

Duckweed (Lemna)

Lemna, commonly known as Duckweed is a free floating aquatic plant that forms on the surface of still or slow moving waterbodies. Duckweed can be an important component of the pond ecosystem, serving as a food source for fish, waterfowl and other animals. It also helps to pull excess nutrients such as nitrogen and phosphorous from the water while it grows. Duckweed shades the water, which reduces water temperatures and makes the ponds more habitable for invertebrates and small fish; lower light levels also reduce the growth of nuisance algae and other plants. However, too much duckweed can also cause problems for the ponds. Duckweed multiplies very quickly and can overtake the pond surface in a short amount of time. In the fall, when duckweed dies, nutrients including phosphorous are released back into the water column at once, causing further nutrient loading. The microorganisms facilitating the decay process can also use up the available oxygen, creating anaerobic conditions that cause odours. There is very little duckweed growth within the ponds throughout Silver Springs.

Weather Conditions

Weather conditions impact water quality. Large precipitation events result in more water entering the retention ponds, and heavy rains will bring in increased pollutants and other substances into the system

[21] (Health Canada, 2012)
[22] Ibid
[23] Ibid
[24] (Ohrel, R. L., & Register, K. M, 2006).
[25] Ibid
[26] Ibid

through storm drain and lawn runoff. Higher water flows will push free-floating aquatic vegetation such as duckweed through the system faster, resulting in vegetation buildup at the downstream end of the ponds as it collects near the outfall drains.

The months of May, June and the first week of July were relatively dry, with very few precipitation events, visible in Figure #1. This was reflected by lower water levels throughout the pond systems and low flow rates. In July there were numerous rain events, including significant rain events on July 9th and July 10th (Figure #1), as well as another rain even that began on July 14th, 15th, and 18th, that resulted in higher water flow into the ponds system. There was another significant rain event on August 25th. September was generally wet with several smaller rain events.

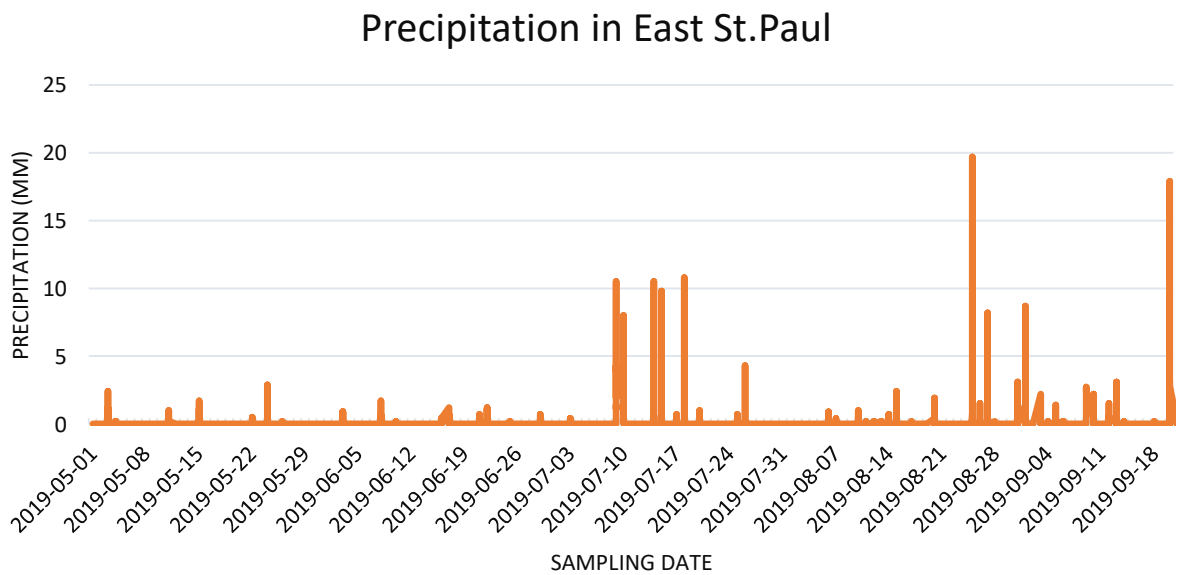

Figure 2. Precipitation in East St. Paul

3 RESULTS

The four ponds of Silver Springs currently have distinct water quality. While the ponds are groundwater fed, the ponds share high pH levels attributed to available lime from previous quarry activate. Groundwater from aquifer sources in the RM is consistently at a pH of approximately 7.5.[27] They also have elevated total phosphorous levels that indicate nutrient loading. Dissolved oxygen (DO) levels throughout the four waterbodies are sufficient to support a healthy aquatic ecosystem. The large surface area of all the Silver Springs ponds provides ample opportunity for aeration from wind and wave action.

[27] (Winsor, 2019, pers. Comm.)

Silver Springs Pond A (SS A)

The pH levels in SS A were higher than the upper limit for the protection of aquatic life (9.0 pH units) in July, August, and September, indicating aquatic organisms in the pond are frequently exposed to pH stress. pH was within the guideline range in June, then increased and remained elevated thereafter. High pH levels present in the Silver Springs ponds are attributed to their limestone quarry base which is a common condition in former limestone quarries. Groundwater from aquifer sources in the Rm is consistently at a pH of 7.5.

Dissolved oxygen (DO) concentrations in SS A were generally good and within PAL guideline values. Exceptions occurred three times through the summer; DO fell below the objective for protection of aquatic life (6.5 mg/L) on July 10th and August 1st and 29th (Appendix 1). Various aquatic wildlife was observed in SS A including minnows, frogs, turtles, and muskrat, indicating that DO levels within the pond were generally healthy and able to support a diverse ecosystem throughout the summer.

Nitrogen levels were below the PAL guideline values for Nitrate +Nitrites, as well as Nitrate and Nitrite. Ammonia guideline levels for ponds in Silver Springs are difficult to accurately determine as the ammonia objectives provided by the Manitoba Water Quality Standards, Objectives and Guidelines are appropriate across a pH range of 6.50-9.00 and, as discussed above, pH of SS A was frequently above that range. On all but one occasion, ammonia concentrations in SS A were lower than the guideline of 0.247 mg/L calculated using a pH value of 9.00 and the highest temperature measured during the summer; the exception occurred on July 10th. The site-specific guideline for that date was calculated to be 0.291 mg/L, which was exceeded. Ammonia in the pond was back to an acceptable concentration by July 24th.

Total phosphorous levels in SS A exceeded the provincial objective for control of nuisance algal growth (0.025 mg/L) during every sampling event in 2019. On average, TP concentrations were nearly eight times the provincial narrative guideline and Pond SS A would be classified as hyper-eutrophic using the CCME trigger ranges defined in Table #4. As such, the high TP concentrations could be contributing to the abundance of algae in the pond. Average TP levels are higher in SS A than the other three ponds in Silver Springs.

Residents have also expressed some concern about the brown color and foul odour of SS A.[28] The turbidity and TSS levels in SS A are generally higher than the other ponds within the park. Brown, foam-like algae was present along the pond banks and suspended sediment was visible in the water column from the shore.

Chlorophyll *a* levels in SS A were extremely high and concentrations increased through the summer, which indicates a high abundance of plant growth in the pond. There were no visible aquatic weeds or vegetation present in SS A; therefore, it is possible that particulates/suspended matter observed in the pond are actually algal material with possible suspended fine clay particles.

SS A has been observed to have usage by the resident geese population, consisting of around 40 geese.[29] The effect of goose fecal matter was discussed as a possible source of increased nutrient levels, the

[28] (RM ESP, 2019)
[29] Ibid

brown color and odour; therefore, the fecal coliform count of SS A was analyzed five times during the sampling season. On average, the fecal coliform count was just over two times the guideline for recreational use of a waterbody (200 CFU/100 mL). The other three ponds showed no elevated levels. Since the elevated levels were not correlated to a high goose use period (fall migration), the source of the elevated fecals is unknown.

Samples for algae identification were collected on SS A on July 10th and August 7th, 2019 (Appendix 2).[30]Analysis on July 10th indicated small amounts of Phacus, Aphanocapsa and Microcystic species; large amounts of Cryptomonas, Limnothrix, and an unidentified dispersed rod shaped single cell cyanobacteria; as well as massive amounts of Merismopedia, Planktothrix and Pseudanabaena species. Total blue green algae cells (cyanobacterial cell count) on July 10th was 2,230,000 cells/mL. The cyanobacteria species present were Aphanocapsa (300 cells/mL), Limnothrix (162,000 cells/mL), Merismopedia (611,000 cells/mL), Planktothrix (505,000 cells/mL), Pseudanabaena (715,000 cells/mL) as well as an unidentified dispersed rod shaped single celled cyanobacteria species (235,000 cells/mL).

Algal analysis from August 7th, 2019 indicated small amounts of Scenedesmus, Euglena, Phacus, Aphanizomenon and Rhopalodia species; moderate amounts of Cryptomonas, small Chrysophytes, Microcystis and Limnothrix species; large amounts of Merismopedia and Planktothrix species; as well as massive amounts of Pseudanabaena.

Table 5. Summary of Water Quality Results in Silver Springs Pond A

Parameter	Units	Guideline Limit	Silver Springs A (SS A)		
			Minimum	Maximum	Average
Water Temperature	°C		16.7	25.6	21.7
Conductivity	µS/cm		362	1921	717
pH	units	6.5-9	8.81	9.77	9.35
Dissolved Oxygen (field)	mg/L	Min. 6.5	2.86	12.76	8.78
Nitrate + Nitrites	mg/L	10	<0.070	<0.070	<0.070
Nitrate	mg/L	2.93	<0.020	<0.020	<0.020
Nitrite	mg/L	0.06	<0.010	<0.010	<0.010
Ammonia	mg/L	0.247	0.026	0.315	0.078
Total Phosphorous	mg/L	0.025	0.142	0.275	0.210
Total Suspended Solids	mg/L		26.0	44.8	34.1
Turbidity	NTU		20.0	53.8	35.8
Chlorophyll A	mg/L		35.9	187	96.7
Fecal	CFU/100ml	200	45	1410	482
Chlorine	mg/L	0.011	0.010	0.010	0.010

Silver Springs Pond B (SS B)

Although pH increased between June and July in all four ponds in Silver Springs, SS B showed the most dramatic increase. At the beginning of the summer, pH levels were just above 8; however, they increased to more than 10 by July and remained high throughout the remainder of the summer, peaking

[30] ALS Global laboratory defined quantities under four qualitative categories- “small”, “moderate”, “large” and “massive”.

on August 14th. As such, pH in SS B exceeded the provincial guideline for PAL in July, August, and September. It is possible that for Pond SS B, the substrate the submerged aquatic plants were growing in may be buffering the pond's exposure to lime and preventing the pH from further rising.

Dissolved oxygen levels in SS B were consistently above 7.7 and averaged 10.28 mg/L; thus, concentrations were above the guideline minimum value of 6.5 mg/L which indicates healthy oxygen levels in the pond. SS B was the pond that initially had aerators installed in 2018; these were removed in early 2019 due to operational issues with power supply. However, without the aerator the DO levels remained high.

Nitrogen levels within SS B are below the guideline values for all 4 parameters (Nitrate, Nitrite, Nitrate + Nitrite and Ammonia). Ammonia guideline levels for ponds in Silver Springs are difficult to accurately determine as the ammonia objectives provided by the Manitoba Water Quality Standards, Objectives and Guidelines only go up to a pH value of 9.00. However, using the pH value of 9.00 and the maximum temperature for the pond to determine the most stringent objective, ammonia levels did not exceed the guideline in summer 2019.

Total phosphorous levels in SS B were higher than the provincial narrative guideline to prevent the proliferation of nuisance algae and averaged almost three times the guideline of 0.025 mg/L; however, SS B has the lowest mean TP and chlorophyll *a* levels of all four ponds. Aquatic vegetation growth in SS B is in the form of submerged aquatic weeds. In some areas, the weeds have accumulated and are visible at the pond surface do, which may help to deter geese from landing in the pond. SS B would be classified as eutrophic to hyper-eutrophic using the trigger ranges defined in Table #4 indicating high levels of biological activity due to excessive nutrients in the system.

Turbidity and TSS in SS B was relatively low compared to the other ponds in Silver Springs and, in general, water clarity was clear throughout the sampling season. Although it was hypothesized that the presence of aquatic weeds in SS B was limiting the amount of geese landing in the ponds, residents indicated that SS B periodically has a large geese population. Fecal coliform analyses varied dramatically by sample, but the average fecal coliform count was slightly above the recreational objective of 200 CFU/100mL . SS B is the pond most frequently used for recreational water activities such as canoeing or kayaking.

Samples for algae identification were collected from SS B on August 7th, 2019 (Appendix 2). Analysis revealed small amounts of Nitzschia, Synedra, Chlamydomonas, Cosmarium, Dictyosphaerium, Monoraphidium, Oocystis, Scenedesmus, Stauruastrum, Tetraedron, Cryptomonas, Euglena, Anabaena, Planktolyngbya and Phopolodia species. Analysis also identified moderate amounts of Pseudanabaena, large amounts of Gomphosphaeria and Microcystis, and massive amounts of Merismopedia.

Table 6. Summary of Water Quality Results in Silver Springs Pond B

Parameter	Units	Guideline Limit	Silver Springs B (SS B)		
			Minimum	Maximum	Average
Water Temperature	°C		16.2	24.7	21.5
Conductivity	µS/cm		329	1816	637
pH	units	6.5-9	8.26	10.80	9.94
Dissolved Oxygen (field)	mg/L	Min. 6.5	7.72	14.38	10.30
Nitrate + Nitrites	mg/L	10	<0.070	<0.070	<0.070
Nitrate	mg/L	2.93	<0.020	<0.020	<0.020
Nitrite	mg/L	0.06	<0.010	<0.010	<0.010
Ammonia	mg/L	0.247	0.019	0.194	0.069
Total Phosphorous	mg/L	0.025	0.049	0.131	0.085
Chlorophyll A	mg/L		4.1	86.3	28.7
Total Suspended Solids	mg/L		3.7	44.7	16.6
Turbidity	NTU		2.4	24.3	9.6
Fecal	CFU/100mL	200	1	1050	215
Chlorine	mg/L	0.011	0.010	0.010	0.010

Silver Springs Pond C (SS C)

The pH levels in SS C were higher than the guideline value of 6.5-9 in July, August, and September. pH in SS C increased in July (compared to June) then remained relatively stable.

Dissolved oxygen levels in SS C were high throughout the sampling period and well above the minimum guideline value of 6.5 mg/L for the protection of aquatic life.

All nitrogenous parameters (NH_3, NO_3, NO_2, and $NO_3 + NO_2$,) were all below the respective guidelines or objectives. In the case of Ammonia, using a pH of 9.00 and the highest temperature to calculate the most stringent objective, ammonia levels should not have exceeded 0.247 mg/L, however they reached 0.660 mg/L on June 19th. Using the temperature and pH level on that specific date (Appendix 1) to calculate the ammonia objective found that ammonia levels did not exceed the site-specific limit of 0.792 mg/L.

Total phosphorous levels were high and exceeded the provincial narrative guideline value of 0.025 mg/L to prevent formation of nuisance algae. On average, TP levels were seven times higher than the provincial guideline. SS C would be considered as eutrophic to hyper-eutrophic using the trigger ranges defined in Table #4 indicating high levels of biological activity due to excessive nutrients in the system.

In 2019, SS C had bright blue water with high levels of green algae growth. There were frequently geese present during sampling and an odour was also noted during sampling conducted later in the season, likely caused by the large algae blooms present along the shoreline, as well as accumulation of fecal matter. Chlorophyll-a levels fluctuated, but typically remained quite high as reflected by the high abundance of algae in the pond.

Samples for algae identification were collected from SS C on July 10th, 2019 and August 7th, 2019 (Appendix 2). Analysis on July 10th indicated small amounts of Fragilaria, Melosira, Naviula, Oedogonium, Pediastrum, Cryptomonas, Euglena, Phacus, Aphanocapsa, Gomphosphaeria, Microcystis,

Phormidium, Psuedanabaena, Planktolyngbya species. Analysis also revealed moderate amounts of Nitzschia, Monoraphidium, Scenedesmus, Schroederia and Cyanodictyon, as well as large amounts of Merismopedia and an unidentified dispersed coccoid shaped single celled cyanobacteria.

Total blue green algae cells (cyanobacterial cell count) was 358,000 cell/mL. The cyanobacteria species present were Aphanocapsa (2,000 cells/mL), Gomphosphaeria (100 cells/mL), Merismopedia (169,000 cells/mL), Microcystis (2,200 cells/mL), Phromidium (720 cells/mL), Planktolyngbya (990 cells/mL), Pseudanabaena (8,910 cells/mL), Unidentified dispersed coccoid shaped single celled blue green (129,000 cells/mL) and Cyanodictyon (44,600 cells/mL).

Analysis on August 7th, 2019 indicated small amounts of Chlamydomonas, Closterium, Cosmarium, Monoraphidium, Oocystis, Scenedesmus, Tetraedron, Cryptomonas, Euglena and Phormidium species. Also present were moderate amounts of Pseudanabaena, large amounts of Aphanizomenon and Planktolyngbya, as well as massive amounts of Merismopedia and Microcystis species.

Table 7. Summary of Water Quality Results in Silver Springs C

Parameter	Units	Guideline Limit	Silver Springs C (SS C)		
			Minimum	Maximum	Average
Water Temperature	°C		17.1	25.7	22.0
Conductivity	µS/cm		391	1861	749
pH	units	6.5-9	8.36	9.95	9.35
Dissolved Oxygen (field)	mg/L	Min. 6.5	6.52	12.51	10.02
Nitrate + Nitrites	mg/L	10	<0.070	<0.070	<0.070
Nitrate	mg/L	2.93	<0.020	0.035	0.023
Nitrite	mg/L	0.06	<0.010	0.017	0.011
Ammonia	mg/L	0.247*	0.023	0.660	0.185
Total Phosphorous	mg/L	0.025	0.089	0.258	0.183
Chlorophyll A	mg/L		5.62	136	70.8
Total Suspended Solids	mg/L		2.3	47.5	27.8
Turbidity	NTU		3.99	36.5	21.6
Fecal	CFU/100ml	200	7	629	304
Chlorine	mg/L	0.011	0.010	0.010	0.010

Silver Springs Pond D (SS D)

pH levels increased between June and July then remained high throughout the remainder of the sampling season. SS D generally had the highest pH levels of the four ponds (Appendix 3) and levels exceeded the provincial guideline for PAL on all but one occasion which occurred on June 26th (Appendix 1).

Dissolved oxygen levels in SS D were high and remained above the minimum guideline value of 6.5 mg/L for the protection of aquatic life.

Nitrogen levels for all four parameters (NH_3, NO_3, $NO_3 + NO_2$ and NO_2) were below the provincial objectives or guidelines even at maximum concentrations.

Total phosphorous concentrations exceeded the narrative guideline value of 0.025 mg/L by approximately 6 times on average. SS D would be considered as eutrophic to hyper-eutrophic using the trigger ranges defined in Table #4 again indicating high levels of biological activity due to excessive nutrients in the system.

SS D had relatively clear water and low amounts of aquatic vegetation in 2019. The water level in SS D was quite low at the beginning of the season and it continued to decline throughout the summer. Turbidity and TSS in SS D were low at the beginning of the sampling season, but increased throughout the season as water depth decreased. Chlorophyll-a levels fluctuated throughout the summer, but typically remained quite high and were comparable to levels measured in SS C.

Fecal coliform levels remained relatively in comparison to the other three ponds. Resident observations indicated that SS D was frequently used by migratory goose population, however geese were rarely observed using the pond during sampling.

Samples for algae identification were collected on August 7th, 2019. Analysis identified small amounts of Cosmarium, Monoraphidium, Oocystis, Pediastrum, Cryptomonas, Euglena, Phacus, Aphanizomenon, Microcystis, Pseudanabaena and Eucapsis species. Analysis also identified moderate amounts of Scenedesmus, Chroococcus, Merismopedia, Gymnodinium, and Planktolyngbya as well as large amounts of Gomphosphaeria species.

Table 8. Summary of Water Quality Results in Silver Springs D

Parameter	Units	Guideline Limit	Silver Springs D (SS D)		
			Minimum	Maximum	Average
Water Temperature	°C		15.1	24.1	20.8
Conductivity	µS/cm		382	1913	721
pH	units	6.5-9	8.52	10.88	10.10
Dissolved Oxygen (field)	mg/L	Min. 6.5	7.22	14.40	10.81
Nitrate + Nitrites	mg/L	10	<0.070	<0.070	<0.070
Nitrate	mg/L	2.93	<0.020	<0.020	<0.020
Nitrite	mg/L	0.06	<0.010	<0.010	<0.010
Ammonia	mg/L	0.247	0.027	0.103	0.047
Total Phosphorous	mg/L	0.025	0.047	0.249	0.151
Chlorophyll A	mg/L		0.69	93.1	48.4
Total Suspended Solids	mg/L		2.9	134.0	66.4
Turbidity	NTU		1.54	59.9	24.8
Fecal	CFU/100ml	200	1	131	34
Chlorine	mg/L	0.011	0.020	0.020	0.020

4 CONCLUSIONS & RECOMMENDATIONS

The Ponds within Silver Springs Park are unique; they operate as four distinct systems, rather than one cohesive watershed. However, they do share some similarities in regards to their water quality that is likely contributing to some of the visual issues that were observed.

All four ponds have issues with excess nutrients, specifically with total phosphorous concentrations resulting in them being considered as eutrophic or hyper-eutrophic by the Canadian Guidance

Framework. Phosphorous is likely entering the water from various sources, including fertilizer runoff from neighboring residential properties. Fecal matter from waterfowl is also a likely source of excess phosphorous in the system. This nutrient loading fuels to growth of aquatic vegetation.

Algal identification indicated that the ponds contain species with the potential to produce toxic blue-green algae blooms, with Pond A and Pond C having the most dominant communities. However, not all blue green algae produce toxins and even the ones capable of producing toxins don't produce it all the time. Therefore, it is important to continue to educate residents on the potential concerns of blue-green algae and to closely monitor bloom presence within the ponds in the future.

pH levels throughout the four ponds are high, exceeding the guideline for protection of aquatic life. It is likely that the limestone quarry base of the ponds is contributing to the elevated pH levels within the four ponds. Limestone acts as a neutralizing agent and is often used in pond systems that have very low and thus acidic pH levels to raise them and make the water more neutral.

Residents have raised concerns about the presence of aquatic vegetation in the ponds, notably within SS B and questions were received about the possibility of removing the aquatic vegetation, particularly the submerged aquatic vegetation (SAV). Since there is no outflow from the ponds[31], removing aquatic vegetation would help to remove nutrients from the current pond nutrient cycle. However, because the Silver Springs ponds are a relatively closed system, this removal would need to proceed cautiously to avoid exacerbating existing issues. The SAV bed at the bottom of the pond may be preventing further leaching of lime into the water column, and removing the aquatic vegetation using a mechanical method could disturb the substrate[32], possible leading to further pH increases. Any removal should proceed cautiously with monitoring of surface water for nutrients and pH. It has been identified that removing the SAV root system destabilizes the sediment at the bottom of the pond, which would increase TSS and turbidity levels. [33]

Since DO concentrations in the ponds were consistently observed at levels above the guideline for protection of aquatic life, augmented aeration will not result in improved water quality in the Silver Springs Ponds and is not recommended.

Recommendations to reduce nutrient loading in the ponds consist of measures to promote uptake of nutrients by vegetation and dissuade increases in goose populations, particularly resident populations. Measures to support healthy macrophyte and upland hardy native vegetation such as grasses and shrubs should be considered.

To reduce the spread of purple loosestrife and avoid it outcompeting important macrophyte vegetation at the waters edge, manual removal of purple loosestrife in the Park occurred in the summer of 2019. The spread of purple loosestrife should be monitored with beetle introduction and manual controls considered on a seasonal basis.

Other measures to introduce beneficial vegetation such as manmade floating islands with wetland vegetation communities have been successfully implemented elsewhere.[34] These islands remove

[31] Only outflow will be groundwater infiltration
[32] (Ohrel, R. L., & Register, K. M, 2006)
[33] Ibid
[34] (Winston et al., 2013).

nutrients and can be harvested on periodic basis (8-10 years). A pilot would confirm if vegetation can be successfully grown on floating islands in the high pH waters of the ponds.

Implementing a naturalization plan to migrate existing grasses to native and other hardy species with deep root systems will not only capture nutrients from making their ways down the slopes to the ponds but also promote bank stability in dry years. These measures should be supplemented with a decrease in the mowing regime in the areas adjacent to the ponds.

Geese in particular favour loafing and feeding in short grasses, shying away from tall grass and other heavily vegetated environments because of the potential for these areas to harbour predators. Residents report that existing and transient predator populations appear to be helping to keep resident goose populations in check. Predators such as fox, coyote and raptors such as eagles provide important population controls and their presence should not be discouraged. More invasive measures for goose control such as noise cannons, fencing and are not consistent with park aesthetics and should only be considered if resident goose populations grow exponentially and then only in consultation with local residents and provincial wildlife officials.

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6 APPENDICES

Appendix 1. Full Water Quality Data

Appendix 2. Laboratory Reports

Appendix 3. Graphical Representation of Water Quality Data

Appendix 1. Full Water Quality Data

LOCATION	DATE	TIME	AIR TEMP (°C)	CONDUCTIVITY (µS/cm)	pH	DO (field) (mg/L)	Water Temp (°C)	TSS (mg/L)	TURBIDITY (NTU)	Nitrate in Water by IC (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite in Water by IC (mg/L)	TOTAL PHOSPHOROUS (mg/L)	AMMONIA as N (mg/L)	TOTAL CHLORINE (mg/L)	DO (lab) (mg/L)	CHLORO-PHYLL A (ug/L)	FECAL (MPN/100ml)
Silver Springs																		
SS A	6/19/2019	10:40	20	n.d.	8.89	11.90	20.2	44.8	53.8	0.020	0.070	0.010	0.200	0.026	0.010		51.6	
SS A	6/27/2019	10:15	19	362	8.81	12.76	22.6	37.9	47.4	0.020	0.070	0.010	0.217	0.041			35.9	
SS A	7/10/2019	12:20	21	381	9.58	2.86	22.5	35.8	36.4	0.020	0.070	0.010	0.275	0.315			50.3	1410
SS A	7/17/2019	9:50	21	405	9.70	10.30	25.6											
SS A	7/24/2019	9:30	21	395	9.77	11.52	25.0	26.0	20.0	0.020	0.070	0.010	0.211	0.028			78.8	45
SS A	8/1/2019	8:42	21	1575	9.15	6.46	22.7											
SS A	8/7/2019	9:30	17	1921	9.27	6.95	22.7	29.2	30.9	0.020	0.070	0.010	0.218	0.065			109.0	84
SS A	8/14/2019	10:10		527	9.71	11.33	21.5											
SS A	8/21/2019	9:44	14	435	9.48	8.16	20.0											
SS A	8/29/2019	9:05	14	455	9.59	6.31	16.7	37.9	31.1	0.020	0.070	0.010	0.207	0.037			187.0	411
SS A	9/19/2019	9:20	15		8.90	8.04	19.1	26.9	30.7	0.020	0.070	0.010	0.142	0.033			164.0	461
MINIMUM			14	362	8.81	2.86	16.7	26.0	20.0	0.020	0.070	0.010	0.142	0.026	0.010		35.9	45
MAXIMUM			21	1921	9.77	12.76	25.6	44.8	53.8	0.020	0.070	0.010	0.275	0.315	0.010		187.0	1410
AVERAGE			18	717	9.35	8.78	21.7	34.1	35.8	0.020	0.070	0.010	0.210	0.078	0.010		96.7	482
SS B	6/19/2019	10:00	20	329	8.26	8.60	20.5	7.7	4.0	0.020	0.070	0.010	0.0524	0.072	0.010		4.09	
SS B	6/27/2019	10:00	19	366	8.37	10.42	22.6	3.7	2.36	0.020	0.070	0.010	0.0488	0.102			4.67	
SS B	7/10/2019	12:10	21	343	10.27	9.33	24.0	10.1	7.8	0.020	0.070	0.010	0.066	0.020			15.6	1050
SS B	7/17/2019	9:33	21	401	10.25	9.38	24.7											
SS B	7/24/2019	9:17	21	373	n.d.	12.64	23.9	13.1	6.8	0.020	0.070	0.010	0.084	0.019			27.9	1
SS B	8/1/2019	8:33	21	1426	10.07	9.36												
SS B	8/7/2019	9:20	17	1816	10.26	11.67	22.5	21.3	10.8	0.020	0.070	0.010	0.102	0.024			31.3	1
SS B	8/14/2019	9:57		504	10.80	11.70	21.5											
SS B	8/21/2019	9:37	14	421	10.49	14.38	19.6											
SS B	8/29/2019	9:00	14		10.57	8.06	16.2	44.7	24.3	0.020	0.070	0.010	0.131	0.194			86.3	4
SS B	9/19/2019	9:13	15	389	10.05	7.72	19.2	15.9	11.3	0.020	0.070	0.010	0.113	0.050			31.3	21
MINIMUM			14	329	8.26	7.72	16.2	3.7	2.4	0.020	0.070	0.010	0.049	0.019	0.010		4.1	1
MAXIMUM			21	1816	10.80	14.38	24.7	44.7	24.3	0.020	0.070	0.010	0.131	0.194	0.010		86.3	1050
AVERAGE			18	637	9.94	10.30	21.5	16.6	9.6	0.020	0.070	0.010	0.085	0.069	0.010		28.7	215
SS C	6/19/2019	11:15	21		8.46	10.90	20.5	7.5	7.01	0.035	0.070	0.013	0.109	0.660	0.010		19.2	
SS C	6/26/2019	10:35	19	425	8.36	9.66	22.0	2.3	3.99	0.028	0.070	0.017	0.0894	0.474		9.40	5.62	
SS C	7/10/2019	12:40	21	391	9.70	10.67	24.7	20.7	15.9	0.020	0.070	0.010	0.168	0.046			88.4	548
SS C	7/17/2019	10:05	22	438	9.47	9.20	25.7											
SS C	7/24/2019	9:45	21	414	9.57	11.46	24.7	28.4	25.4	0.020	0.070	0.010	0.220	0.023			66.7	7
SS C	8/1/2019	9:05	21	1536	9.23	8.72	23.3											
SS C	8/7/2019	9:52	18	1861	9.52	10.46	22.9	41.9	36.5	0.020	0.070	0.010	0.258	0.033			82.3	28
SS C	8/14/2019	10:23		513	9.85	12.51	21.6											
SS C	8/21/2019	9:57	14	418	9.59	10.62	20.6											
SS C	8/29/2019	9:37	14		9.95	9.54	17.1	46.1	32.8	0.020	0.070	0.010	0.198	0.037			97.6	308
SS C	9/19/2019	9:37	15		9.14	6.52	19.0	47.5	29.8	0.020	0.070	0.010	0.242	0.025			136.0	629
MINIMUM			14	391	8.36	6.52	17.1	2.3	3.99	0.020	0.070	0.010	0.089	0.023	0.010	9.40	5.62	7
MAXIMUM			22	1861	9.95	12.51	25.7	47.5	36.5	0.035	0.070	0.017	0.258	0.660	0.010	9.40	136.0	629
AVERAGE			19	749	9.35	10.02	22.0	27.8	21.6	0.023	0.070	0.011	0.183	0.185	0.010	9.40	70.8	304
SS D	6/19/2019	11:31	21	441	9.13	10.80	19.6	2.9	1.54	0.020	0.070	0.010	0.0469	0.035	0.020		0.69	
SS D	6/27/2019	11:10	22	420	8.52	11.75	22.3	7.2	4.98	0.020	0.070	0.010	0.0967	0.041			7.59	
SS D	7/10/2019	12:55	21	382	n.d.	8.97	22.6	34.3	12.8	0.020	0.070	0.010	0.113	0.028			93.1	131
SS D	7/17/2019	10:15	22	421	10.29	10.54	24.0											
SS D	7/24/2019	10:00	21	399	10.53	11.92	24.1	54.4	15.4	0.020	0.070	0.010	0.133	0.029			36.8	3
SS D	8/1/2019	9:13	21	1540	10.24	8.30	22.9											
SS D	8/7/2019	10:05	18	1913	10.40	12.09	20.8	120.0	24.1	0.020	0.070	0.010	0.200	0.027			50.1	1
SS D	8/14/2019	10:31		543	10.88	14.40	21.2											
SS D	8/21/2019	10:06	14	429	10.47	12.95	17.7											
SS D	8/29/2019	9:50	14		10.66	10.00	15.1	134.0	59.9	0.020	0.070	0.010	0.249	0.103			74.3	25
SS D	9/19/2019	9:47	15		9.88	7.22	18.9	112.0	55.2	0.020	0.070	0.010	0.215	0.069			76.5	10
MINIMUM			14	382	8.52	7.22	15.1	2.9	1.5	0.020	0.070	0.010	0.047	0.027	0.020		0.7	1
MAXIMUM			22	1913	10.88	14.40	24.1	134.0	59.9	0.020	0.070	0.010	0.249	0.103	0.020		93.1	131
AVERAGE			19	721	10.10	10.81	20.8	66.4	24.8	0.020	0.070	0.010	0.151	0.047	0.020		48.4	34

LEGEND
cells = <indicated value

Appendix 2. Laboratory Reports

RM of East St. Paul
ATTN: Leanne Shewchuk
3021 Birdshill Road
East St. Paul MB R2E 1A7

Date Received: 14-JUN-19
Report Date: 24-JUN-19 15:44 (MT)
Version: FINAL

Client Phone: 204-668-8112

Certificate of Analysis

Lab Work Order #: L2291959

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2291959-1 SS A							
Sampled By: TM on 13-JUN-19 @ 10:00							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-JUN-19	R4673753
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	4.09		0.10	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.072		0.010	mg/L		17-JUN-19	R4672883
Chlorine, Total	0.010	CLH	0.010	mg/L		15-JUN-19	R4672207
Phosphorus (P)-Total	0.0524		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	7.7		2.0	mg/L		20-JUN-19	R4681118
Turbidity	4.00		0.10	NTU		14-JUN-19	R4672328
L2291959-2 SS B							
Sampled By: TM on 13-JUN-19 @ 10:40							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-JUN-19	R4673753
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	51.6		0.10	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.026		0.010	mg/L		21-JUN-19	R4682037
Chlorine, Total	<0.010	CLH	0.010	mg/L		15-JUN-19	R4672207
Phosphorus (P)-Total	0.200		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	44.8		2.0	mg/L		20-JUN-19	R4681118
Turbidity	53.8		0.10	NTU		14-JUN-19	R4672328
L2291959-3 SS C							
Sampled By: TM on 13-JUN-19 @ 11:15							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.035		0.020	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	0.013		0.010	mg/L		14-JUN-19	R4673753
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	19.2		0.10	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.66		0.10	mg/L		21-JUN-19	R4682037
Chlorine, Total	0.010	CLH	0.010	mg/L		15-JUN-19	R4672207

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2291959-3 SS C							
Sampled By: TM on 13-JUN-19 @ 11:15							
Matrix: WATER							
Phosphorus (P)-Total	0.109		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	7.5		2.0	mg/L		20-JUN-19	R4681118
Turbidity	7.01		0.10	NTU		14-JUN-19	R4672328
L2291959-4 SS D							
Sampled By: TM on 13-JUN-19 @ 11:31							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-JUN-19	R4673753
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	0.69		0.10	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.035		0.010	mg/L		17-JUN-19	R4672883
Chlorine, Total	0.020	CLH	0.010	mg/L		15-JUN-19	R4672207
Phosphorus (P)-Total	0.0469		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	2.9		2.0	mg/L		20-JUN-19	R4681118
Turbidity	1.54		0.10	NTU		14-JUN-19	R4672328
L2291959-5 CS U							
Sampled By: TM on 13-JUN-19 @ 14:12							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-JUN-19	R4673753
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	108		0.20	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.024		0.010	mg/L		21-JUN-19	R4682037
Chlorine, Total	0.020	CLH	0.010	mg/L		15-JUN-19	R4672207
Phosphorus (P)-Total	0.0813		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	17.3		2.0	mg/L		20-JUN-19	R4681118
Turbidity	26.4		0.10	NTU		14-JUN-19	R4672328
L2291959-6 CS L							
Sampled By: TM on 13-JUN-19 @ 14:45							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		14-JUN-19	R4673753

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2291959-6 CS L							
Sampled By: TM on 13-JUN-19 @ 14:45							
Matrix: WATER							
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	6.06		0.10	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.017		0.010	mg/L		17-JUN-19	R4672883
Chlorine, Total	0.050	CLH	0.010	mg/L		15-JUN-19	R4672207
Oxygen, Dissolved	15.0	RWHS	0.10	mg/L		14-JUN-19	R4672730
Phosphorus (P)-Total	0.0456		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	4.9		2.0	mg/L		20-JUN-19	R4681118
Turbidity	1.59		0.10	NTU		14-JUN-19	R4672328
L2291959-7 S U							
Sampled By: TM on 13-JUN-19 @ 13:30							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		14-JUN-19	R4673753
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	13.6		0.10	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.034		0.010	mg/L		17-JUN-19	R4672883
Chlorine, Total	0.060	CLH	0.010	mg/L		15-JUN-19	R4672207
Phosphorus (P)-Total	0.104		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	17.6		2.0	mg/L		20-JUN-19	R4681118
Turbidity	4.53		0.10	NTU		14-JUN-19	R4672328
L2291959-8 S L							
Sampled By: TM on 13-JUN-19 @ 13:45							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		14-JUN-19	R4673753
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	23.6		0.10	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.016		0.010	mg/L		17-JUN-19	R4672883
Chlorine, Total	0.050	CLH	0.010	mg/L		15-JUN-19	R4672207
Phosphorus (P)-Total	0.0565		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	14.1		2.0	mg/L		20-JUN-19	R4681118
Turbidity	3.28		0.10	NTU		14-JUN-19	R4672328

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2291959-9 BTP 1							
Sampled By: TM on 13-JUN-19 @ 15:20							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		14-JUN-19	R4673753
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	8.15		0.10	ug/L	14-JUN-19	14-JUN-19	R4675504
Miscellaneous Parameters							
Ammonia, Total (as N)	0.021		0.010	mg/L		21-JUN-19	R4682037
Chlorine, Total	0.020	CLH	0.010	mg/L		15-JUN-19	R4672207
Phosphorus (P)-Total	0.0480		0.0030	mg/L		18-JUN-19	R4672439
Total Suspended Solids	13.3		2.0	mg/L		20-JUN-19	R4681118
Turbidity	10.8		0.10	NTU		14-JUN-19	R4672328

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
CLH	Free/Total Chlorine sample had headspace. Hold time for Chlorine tests is 15 minutes; field testing is recommended. Chlorine dissipates rapidly into headspace.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RWHS	Samples Received With Headspace

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CHL/A-ACET-FLUORO-WP	Water	Chlorophyll a by fluorometry	EPA 445.0 ACET
This analysis is done using procedures modified from EPA method 445.0. Chlorophyll a is determined by a 90 % acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.			
CL2-TOTAL-WP	Water	Chlorine, Total	APHA 4500-Cl Chlorine(Residual) G (mod)
Chlorine (residual), as free or total, is analyzed using the DPD colourimetric method. The recommended hold time for these tests is 15 minutes; field testing is recommended for best results. Chlorine can be rapidly consumed by organic matter, if present, and dissipates rapidly into headspace.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
O2-DIS-WP	Water	Dissolved Oxygen	APHA 4500-O-C
Manganous sulphate reacts with potassium or sodium hydroxide to give a white precipitate of manganous hydroxide. In the presence of oxygen, brown manganic hydroxide is formed. Addition of sulfuric acid dissolves the manganic hydroxide, yielding manganic sulfate which reacts with iodide, releasing iodide in an amount equivalent to the original DO content. The iodide is then titrated with a standard solution of thiosulphate. Results for supersaturated samples may be biased low.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - 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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: RM of East St. Paul
3021 Birdshill Road
East St. Paul MB R2E 1A7
Contact: Leanne Shewchuk

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CHL/A-ACET-FLUORO-WP	**Water**							
Batch R4675504								
WG3082093-2 LCS								
Chlorophyll a			101.2		%		80-120	19-JUN-19
WG3082093-1 MB								
Chlorophyll a			<0.10		ug/L		0.1	14-JUN-19
CL2-TOTAL-WP	**Water**							
Batch R4672207								
WG3080082-3 DUP		**L2291959-1**						
Chlorine, Total		0.010	0.010		mg/L	0.0	15	15-JUN-19
WG3080082-2 LCS								
Chlorine, Total			100.0		%		75-125	15-JUN-19
WG3080082-1 MB								
Chlorine, Total			<0.010		mg/L		0.01	15-JUN-19
NH3-COL-WP	**Water**							
Batch R4672883								
WG3080831-10 LCS								
Ammonia, Total (as N)			99.5		%		85-115	17-JUN-19
WG3080831-9 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	17-JUN-19
Batch R4682037								
WG3085326-14 LCS								
Ammonia, Total (as N)			100.0		%		85-115	21-JUN-19
WG3085326-13 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	21-JUN-19
NO2-IC-N-WP	**Water**							
Batch R4673753								
WG3077957-10 LCS								
Nitrite (as N)			102.8		%		90-110	14-JUN-19
WG3077957-6 LCS								
Nitrite (as N)			101.8		%		90-110	14-JUN-19
WG3077957-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	14-JUN-19
WG3077957-9 MB								
Nitrite (as N)			<0.010		mg/L		0.01	14-JUN-19
NO3-IC-N-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-WP	**Water**							
Batch R4673753								
WG3077957-10 LCS								
Nitrate (as N)			100.8		%		90-110	14-JUN-19
WG3077957-6 LCS								
Nitrate (as N)			99.2		%		90-110	14-JUN-19
WG3077957-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	14-JUN-19
WG3077957-9 MB								
Nitrate (as N)			<0.020		mg/L		0.02	14-JUN-19
O2-DIS-WP	**Water**							
Batch R4672730								
WG3080665-2 LCS								
Oxygen, Dissolved			104.6		%		85-115	14-JUN-19
WG3080665-1 MB								
Oxygen, Dissolved			<0.10		mg/L		0.1	14-JUN-19
P-T-COL-WP	**Water**							
Batch R4672439								
WG3079595-18 LCS								
Phosphorus (P)-Total			100.5		%		80-120	18-JUN-19
WG3079595-17 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	18-JUN-19
SOLIDS-TOTSUS-WP	**Water**							
Batch R4681118								
WG3081869-20 LCS								
Total Suspended Solids			102.7		%		85-115	20-JUN-19
WG3081869-19 MB								
Total Suspended Solids			<2.0		mg/L		2	20-JUN-19
TURBIDITY-WP	**Water**							
Batch R4672328								
WG3080125-5 LCS								
Turbidity			105.0		%		85-115	14-JUN-19
WG3080125-4 MB								
Turbidity			<0.10		NTU		0.1	14-JUN-19

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
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

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Dissolved Oxygen							
	6	13-JUN-19 14:45	14-JUN-19 14:36	8.0	24	hours	EHTR
Inorganic Parameters							
Chlorine, Total							
	1	13-JUN-19 10:00	15-JUN-19 14:00	0.25	52	hours	EHTR-FM
	2	13-JUN-19 10:40	15-JUN-19 14:00	0.25	51	hours	EHTR-FM
	3	13-JUN-19 11:15	15-JUN-19 14:00	0.25	51	hours	EHTR-FM
	4	13-JUN-19 11:31	15-JUN-19 14:00	0.25	50	hours	EHTR-FM
	5	13-JUN-19 14:12	15-JUN-19 14:00	0.25	48	hours	EHTR-FM
	6	13-JUN-19 14:45	15-JUN-19 14:00	0.25	47	hours	EHTR-FM
	7	13-JUN-19 13:30	15-JUN-19 14:00	0.25	48	hours	EHTR-FM
	8	13-JUN-19 13:45	15-JUN-19 14:00	0.25	48	hours	EHTR-FM
	9	13-JUN-19 15:20	15-JUN-19 14:00	0.25	47	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2291959 were received on 14-JUN-19 13:40.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2291959-COFC

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Report Form	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	leanne.shewchuk@easstpaul.com
Email 2	operations@easstpaul.com
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	operations@easstpaul.com
Email 2	

Project Information	
ALS Account # / Quote #:	Q74289
Job #:	
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Connor Cattani Sampler: TM

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
1	SS A	13-06-2019	10:00	Water	4	R	R		R	R	R	R	R		
2	SS B	13-06-2019	10:40	Water	4	R	R		R	R	R	R	R		
3	SS C	13-06-2019	11:15	Water	4	R	R		R	R	R	R	R		
4	SS D	13-06-2019	11:31	Water	4	R	R		R	R	R	R	R		
5	CS U	13-06-2019	2:12	Water	4	R	R		R	R	R	R	R		
6	CS L	13-06-2019	2:45	Water	5	R	R	R	R	R	R	R	R		
7	S U	13-06-2019	1:30	Water	4	R	R		R	R	R	R	R		
8	S L	13-06-2019	1:45	Water	4	R	R		R	R	R	R	R		
9	BTP 1	13-06-2019	3:20	Water	4	R	R		R	R	R	R	R		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
11.1							

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by: JH	Date: June 14	Time: 1:40

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

RM of East St. Paul
ATTN: Leanne Shewchuk
3021 Birdshill Road
East St. Paul MB R2E 1A7

Date Received: 19-JUN-19
Report Date: 27-JUN-19 07:02 (MT)
Version: FINAL

Client Phone: 204-668-8112

Certificate of Analysis

Lab Work Order #: L2295004

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2295004-1 P1 U							
Sampled By: CLIENT on 19-JUN-19 @ 09:30							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		20-JUN-19	R4684255
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		25-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		20-JUN-19	R4684255
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	43.6		0.10	ug/L	19-JUN-19	19-JUN-19	R4688383
Miscellaneous Parameters							
Ammonia, Total (as N)	0.064		0.010	mg/L		24-JUN-19	R4685446
Chlorine, Total	0.010	CLH	0.010	mg/L		20-JUN-19	R4680488
Phosphorus (P)-Total	0.144		0.0030	mg/L		21-JUN-19	R4682341
Total Suspended Solids	13.9		2.0	mg/L		25-JUN-19	R4687654
Turbidity	3.70		0.10	NTU		20-JUN-19	R4681974
L2295004-2 P2 L							
Sampled By: CLIENT on 19-JUN-19 @ 09:30							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		20-JUN-19	R4684255
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		25-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		20-JUN-19	R4684255
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	61.6		0.20	ug/L	19-JUN-19	19-JUN-19	R4688383
Miscellaneous Parameters							
Ammonia, Total (as N)	0.065		0.050	mg/L		25-JUN-19	R4688367
Chlorine, Total	0.020	CLH	0.010	mg/L		20-JUN-19	R4680488
Phosphorus (P)-Total	0.480		0.0030	mg/L		21-JUN-19	R4682341
Total Suspended Solids	24.3		2.0	mg/L		25-JUN-19	R4687654
Turbidity	2.47		0.10	NTU		20-JUN-19	R4681974
L2295004-3 P3 L							
Sampled By: CLIENT on 19-JUN-19 @ 09:30							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.258		0.040	mg/L		20-JUN-19	R4684255
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.287		0.070	mg/L		25-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	0.029		0.020	mg/L		20-JUN-19	R4684255
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	49.2		0.10	ug/L	19-JUN-19	19-JUN-19	R4688383
Miscellaneous Parameters							
Ammonia, Total (as N)	0.089		0.010	mg/L		24-JUN-19	R4685446
Chlorine, Total	0.020	CLH	0.010	mg/L		20-JUN-19	R4680488

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2295004-3 P3 L							
Sampled By: CLIENT on 19-JUN-19 @ 09:30							
Matrix:							
Phosphorus (P)-Total	0.193		0.0030	mg/L		21-JUN-19	R4682341
Total Suspended Solids	58.9		2.0	mg/L		25-JUN-19	R4687654
Turbidity	15.4		0.10	NTU		20-JUN-19	R4681974
L2295004-4 P4 L							
Sampled By: CLIENT on 19-JUN-19 @ 09:30							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		20-JUN-19	R4684255
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		25-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		20-JUN-19	R4684255
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	69.3		0.20	ug/L	19-JUN-19	19-JUN-19	R4688383
Miscellaneous Parameters							
Ammonia, Total (as N)	0.038		0.010	mg/L		24-JUN-19	R4685446
Chlorine, Total	0.010	CLH	0.010	mg/L		20-JUN-19	R4680488
Phosphorus (P)-Total	0.238		0.0030	mg/L		21-JUN-19	R4682341
Total Suspended Solids	19.1		2.0	mg/L		25-JUN-19	R4687654
Turbidity	7.77		0.10	NTU		20-JUN-19	R4681974
L2295004-5 P6 L							
Sampled By: CLIENT on 19-JUN-19 @ 09:30							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		20-JUN-19	R4684255
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		25-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		20-JUN-19	R4684255
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	34.3		0.10	ug/L	19-JUN-19	19-JUN-19	R4688383
Miscellaneous Parameters							
Ammonia, Total (as N)	0.079		0.010	mg/L		25-JUN-19	R4685446
Chlorine, Total	0.020	CLH	0.010	mg/L		20-JUN-19	R4680488
Phosphorus (P)-Total	0.262		0.0030	mg/L		21-JUN-19	R4682341
Total Suspended Solids	32.1		2.0	mg/L		25-JUN-19	R4687654
Turbidity	24.4		0.10	NTU		20-JUN-19	R4681974

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
CLH	Free/Total Chlorine sample had headspace. Hold time for Chlorine tests is 15 minutes; field testing is recommended. Chlorine dissipates rapidly into headspace.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CHL/A-ACET-FLUORO-WP	Water	Chlorophyll a by fluorometry	EPA 445.0 ACET
This analysis is done using procedures modified from EPA method 445.0. Chlorophyll a is determined by a 90 % acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.			
CL2-TOTAL-WP	Water	Chlorine, Total	APHA 4500-Cl Chlorine(Residual) G (mod)
Chlorine (residual), as free or total, is analyzed using the DPD colourimetric method. The recommended hold time for these tests is 15 minutes; field testing is recommended for best results. Chlorine can be rapidly consumed by organic matter, if present, and dissipates rapidly into headspace.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - 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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: RM of East St. Paul
3021 Birdshill Road
East St. Paul MB R2E 1A7
Contact: Leanne Shewchuk

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CHL/A-ACET-FLUORO-WP	**Water**							
Batch R4688383								
WG3089010-4 DUP		**L2295004-5**						
Chlorophyll a		34.3	18.1	DUP-H	ug/L	62	35	19-JUN-19
WG3089010-3 LCS								
Chlorophyll a			104.8		%		80-120	26-JUN-19
WG3089010-1 MB								
Chlorophyll a			<0.10		ug/L		0.1	19-JUN-19
WG3089010-2 MB								
Chlorophyll a			<0.10		ug/L		0.1	18-JUN-19
CL2-TOTAL-WP	**Water**							
Batch R4680488								
WG3083963-3 DUP		**L2295004-5**						
Chlorine, Total		0.020	0.020		mg/L	0.0	15	20-JUN-19
WG3083963-2 LCS								
Chlorine, Total			95.0		%		75-125	20-JUN-19
WG3083963-1 MB								
Chlorine, Total			<0.010		mg/L		0.01	20-JUN-19
NH3-COL-WP	**Water**							
Batch R4685446								
WG3087895-2 LCS								
Ammonia, Total (as N)			97.4		%		85-115	24-JUN-19
WG3087895-6 LCS								
Ammonia, Total (as N)			97.2		%		85-115	24-JUN-19
WG3087895-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	24-JUN-19
WG3087895-5 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	24-JUN-19
Batch R4688367								
WG3089044-6 LCS								
Ammonia, Total (as N)			99.6		%		85-115	25-JUN-19
WG3089044-5 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	25-JUN-19
NO2-IC-N-WP	**Water**							
Batch R4684255								
WG3083246-2 LCS								
Nitrite (as N)			101.1		%		90-110	20-JUN-19
WG3083246-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	20-JUN-19
NO3-IC-N-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-WP	**Water**							
Batch R4684255								
WG3083246-2 LCS								
Nitrate (as N)			99.5		%		90-110	20-JUN-19
WG3083246-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	20-JUN-19
P-T-COL-WP	**Water**							
Batch R4682341								
WG3083405-6 LCS								
Phosphorus (P)-Total			96.2		%		80-120	21-JUN-19
WG3083405-5 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	21-JUN-19
SOLIDS-TOTSUS-WP	**Water**							
Batch R4687654								
WG3086688-22 LCS								
Total Suspended Solids			98.0		%		85-115	25-JUN-19
WG3086688-21 MB								
Total Suspended Solids			<2.0		mg/L		2	25-JUN-19
TURBIDITY-WP	**Water**							
Batch R4681974								
WG3085302-8 LCS								
Turbidity			105.5		%		85-115	20-JUN-19
WG3085302-7 MB								
Turbidity			<0.10		NTU		0.1	20-JUN-19

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
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

Sample Parameter Qualifier Definitions:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Inorganic Parameters							
Chlorine, Total							
	1	19-JUN-19 09:30	20-JUN-19 10:00	0.25	24	hours	EHTR-FM
	2	19-JUN-19 09:30	20-JUN-19 10:00	0.25	24	hours	EHTR-FM
	3	19-JUN-19 09:30	20-JUN-19 10:00	0.25	24	hours	EHTR-FM
	4	19-JUN-19 09:30	20-JUN-19 10:00	0.25	24	hours	EHTR-FM
	5	19-JUN-19 09:30	20-JUN-19 10:00	0.25	24	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2295004 were received on 19-JUN-19 16:25.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2295004-COFC

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	leanne.shewchuk@eaststpaul.com
Email 2	operations@eaststpaul.com
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	operations@eaststpaul.com
Email 2	

Project Information	
ALS Account # / Quote #:	Q74289
Job #:	
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L2295004 **ALS Contact:** Connor Cattani **Sampler:** TM

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	P1 U	19-06-2019	9:30	Water	4	R	R		R	R	R	R	R		
	P2 L	19-06-2019	9:50	Water	4	R	R		R	R	R	R	R		
	P3 L	19-06-2019	10:20	Water	4	R	R		R	R	R	R	R		
	P4 L	19-06-2019	10:50	Water	4	R	R		R	R	R	R	R		
	P6 L	19-06-2019	11:15	Water	4	R	R		R	R	R	R	R		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
16.9							

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by: JLt	Date: June 19	Time: 4:05

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date: 19-6-19	Time: 415

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

RM of East St. Paul
ATTN: Leanne Shewchuk
3021 Birdshill Road
East St. Paul MB R2E 1A7

Date Received: 27-JUN-19
Report Date: 09-JUL-19 08:19 (MT)
Version: FINAL

Client Phone: 204-668-8112

Certificate of Analysis

Lab Work Order #: L2300108

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

David Inocando
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2300108-1 P1 U							
Sampled By: TM on 26-JUN-19 @ 08:50							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	10.3		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.049		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.050	CLH	0.010	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.150		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	15.7		2.0	mg/L		03-JUL-19	R4693447
Turbidity	6.06		0.10	NTU		27-JUN-19	R4689852
L2300108-2 P2 L							
Sampled By: TM on 26-JUN-19 @ 09:10							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	47.3		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.171		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.010	CLH	0.010	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.458		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	25.1		2.0	mg/L		03-JUL-19	R4693447
Turbidity	9.15		0.10	NTU		27-JUN-19	R4689852
L2300108-3 P3 L							
Sampled By: TM on 26-JUN-19 @ 09:40							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	32.6		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.053		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.020	CLH	0.010	mg/L		27-JUN-19	R4689878

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2300108-3 P3 L							
Sampled By: TM on 26-JUN-19 @ 09:40							
Matrix: WATER							
Oxygen, Dissolved	7.10		0.10	mg/L		27-JUN-19	R4690757
Phosphorus (P)-Total	0.113		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	5.9		2.0	mg/L		03-JUL-19	R4693447
Turbidity	1.97		0.10	NTU		27-JUN-19	R4689852
L2300108-4 P4 L							
Sampled By: TM on 26-JUN-19 @ 10:15							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	20.5		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.042		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.010	CLH	0.010	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.247		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	20.9		2.0	mg/L		03-JUL-19	R4693447
Turbidity	5.85		0.10	NTU		27-JUN-19	R4689852
L2300108-5 P6 L							
Sampled By: TM on 26-JUN-19 @ 10:35							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	4.81		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.072		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.010	CLH	0.010	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.614		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	15.9		2.0	mg/L		03-JUL-19	R4693447
Turbidity	6.03		0.10	NTU		27-JUN-19	R4689852
L2300108-6 S U							
Sampled By: TM on 26-JUN-19 @ 10:55							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2300108-6 S U							
Sampled By: TM on 26-JUN-19 @ 10:55							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	31.1		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.021		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.150	CLH	0.010	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.127		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	11.6		2.0	mg/L		03-JUL-19	R4693447
Turbidity	3.65		0.10	NTU		27-JUN-19	R4689852
L2300108-7 S L							
Sampled By: TM on 26-JUN-19 @ 11:15							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	3.16		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.041		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.030	CLH	0.010	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.0495		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	4.4		2.0	mg/L		03-JUL-19	R4693447
Turbidity	1.76		0.10	NTU		27-JUN-19	R4689852
L2300108-8 CS U							
Sampled By: TM on 26-JUN-19 @ 11:40							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	7.48		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.030		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	<0.020	CLH	0.020	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.0706		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	4.8		2.0	mg/L		03-JUL-19	R4693447
Turbidity	1.65		0.10	NTU		27-JUN-19	R4689852

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2300108-9 CS L							
Sampled By: TM on 26-JUN-19 @ 12:00							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	78.0		0.50	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.041		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.020	CLH	0.010	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.179		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	19.5		2.0	mg/L		03-JUL-19	R4693447
Turbidity	23.6		0.10	NTU		27-JUN-19	R4689852
L2300108-10 BTP 1							
Sampled By: TM on 26-JUN-19 @ 12:30							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	9.23		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.032		0.010	mg/L		03-JUL-19	R4693823
Chlorine, Total	0.090	CLH	0.010	mg/L		27-JUN-19	R4689878
Phosphorus (P)-Total	0.0885		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	10.7		2.0	mg/L		03-JUL-19	R4693447
Turbidity	9.65		0.10	NTU		27-JUN-19	R4689852
L2300108-11 SS A							
Sampled By: TM on 26-JUN-19 @ 10:00							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	4.67		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.102		0.010	mg/L		03-JUL-19	R4693823
Phosphorus (P)-Total	0.0488		0.0030	mg/L		05-JUL-19	R4694643

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2300108-11 SS A							
Sampled By: TM on 26-JUN-19 @ 10:00							
Matrix: WATER							
Total Suspended Solids	3.7		2.0	mg/L		03-JUL-19	R4693447
Turbidity	2.36		0.10	NTU		27-JUN-19	R4689852
L2300108-12 SS B							
Sampled By: TM on 26-JUN-19 @ 10:15							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	35.9		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.041		0.010	mg/L		04-JUL-19	R4694849
Phosphorus (P)-Total	0.217		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	37.9		2.0	mg/L		03-JUL-19	R4693447
Turbidity	47.4		0.10	NTU		27-JUN-19	R4689852
L2300108-13 SS C							
Sampled By: TM on 26-JUN-19 @ 10:35							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.028		0.020	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.017		0.010	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	5.62		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.474		0.010	mg/L		03-JUL-19	R4693823
Oxygen, Dissolved	9.40		0.10	mg/L		27-JUN-19	R4690757
Phosphorus (P)-Total	0.0894		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	2.3		2.0	mg/L		03-JUL-19	R4693447
Turbidity	3.99		0.10	NTU		27-JUN-19	R4689852
L2300108-14 SS D							
Sampled By: TM on 26-JUN-19 @ 11:10							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-19	R4692567
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-19	R4692567
Chlorophyll a							
Chlorophyll a by fluorometry							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2300108-14 SS D							
Sampled By: TM on 26-JUN-19 @ 11:10							
Matrix: WATER							
Chlorophyll a by fluorometry							
Chlorophyll a	7.59		0.10	ug/L	27-JUN-19	27-JUN-19	R4696236
Miscellaneous Parameters							
Ammonia, Total (as N)	0.041		0.010	mg/L		03-JUL-19	R4693823
Phosphorus (P)-Total	0.0967		0.0030	mg/L		05-JUL-19	R4694643
Total Suspended Solids	7.2		2.0	mg/L		03-JUL-19	R4693447
Turbidity	4.98		0.10	NTU		28-JUN-19	R4692344

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
CLH	Free/Total Chlorine sample had headspace. Hold time for Chlorine tests is 15 minutes; field testing is recommended. Chlorine dissipates rapidly into headspace.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CHL/A-ACET-FLUORO-WP	Water	Chlorophyll a by fluorometry	EPA 445.0 ACET
This analysis is done using procedures modified from EPA method 445.0. Chlorophyll a is determined by a 90 % acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.			
CL2-TOTAL-WP	Water	Chlorine, Total	APHA 4500-Cl Chlorine(Residual) G (mod)
Chlorine (residual), as free or total, is analyzed using the DPD colourimetric method. The recommended hold time for these tests is 15 minutes; field testing is recommended for best results. Chlorine can be rapidly consumed by organic matter, if present, and dissipates rapidly into headspace.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
O2-DIS-WP	Water	Dissolved Oxygen	APHA 4500-O-C
Manganous sulphate reacts with potassium or sodium hydroxide to give a white precipitate of manganous hydroxide. In the presence of oxygen, brown manganic hydroxide is formed. Addition of sulfuric acid dissolves the manganic hydroxide, yielding manganic sulfate which reacts with iodide, releasing iodide in an amount equivalent to the original DO content. The iodide is then titrated with a standard solution of thiosulphate. Results for supersaturated samples may be biased low.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - 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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2300108-COFC

COC Number: 17 -

Page 1 of 2

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: leanne.shewchuk@eaststpaul.com
Email 2: operations@eaststpaul.com
Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☑ FAX
Email 1 or Fax: operations@eaststpaul.com
Email 2:

Select Service Level below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q74289	AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Connor Cattani Sampler: TM

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
1	P1 U	26-06-2019	8:50	Water	4	R	R		R	R	R	R	R		
2	P2 L	26-06-2019	9:10	Water	4	R	R		R	R	R	R	R		
3	P3 L	26-06-2019	9:40	Water	5	R	R	R	R	R	R	R	R		
4	P4 L	26-06-2019	10:15	Water	4	R	R		R	R	R	R	R		
5	P6 L	26-06-2019	10:35	Water	4	R	R		R	R	R	R	R		
6	S U	26-06-2019	10:55	Water	4	R	R		R	R	R	R	R		
7	S L	26-06-2019	11:15	Water	4	R	R		R	R	R	R	R		
8	CS U	26-06-2019	11:40	Water	4	R	R		R	R	R	R	R		
9	CS L	26-06-2019	12:00	Water	4	R	R		R	R	R	R	R		
10	BTP 1	26-06-2019	12:30	Water	4	R	R		R	R	R	R	R		
11	SS A	27-06-2019	10:00	Water	3	R	R		R	R		R	R		
12	SS B	27-06-2019	10:15	Water	3	R	R		R	R		R	R		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
14.3							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: AML	Date: 27/6/19	Time: 1145	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2300108-COFC

COC Number: 17 -

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	leanne.shewchuk@easstpaul.com
Email 2	operations@easstpaul.com
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	operations@easstpaul.com
Email 2	

Project Information	
ALS Account # / Quote #:	Q74289
Job #:	
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Connor Cattani Sampler: TM

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)
- 4 day [P4-20%] ☐
- 3 day [P3-25%] ☐
- 2 day [P2-50%] ☐

EMERGENCY
- 1 Business day [E - 100%] ☐
- Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
13	SS C	27-06-2019	10:35	Water	4	R	R	R	R	R		R	R		
14	SS D	27-06-2019	11:10	Water	3	R	R		R	R		R	R		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
14.3							

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by: AAL	Date: 27/6/19	Time: 1:205

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

RM of East St. Paul
ATTN: Leanne Shewchuk
3021 Birdshill Road
East St. Paul MB R2E 1A7

Date Received: 10-JUL-19
Report Date: 24-JUL-19 15:51 (MT)
Version: FINAL

Client Phone: 204-668-8112

Certificate of Analysis

Lab Work Order #: L2307649

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2307649-1 P1 U							
Sampled By: TM on 10-JUL-19 @ 09:15							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	1.11		0.10	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	1.18		0.11	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.073		0.050	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	2.71		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.063		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.292		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	25.6		2.0	mg/L		17-JUL-19	R4714220
Turbidity	18.9		0.10	NTU		11-JUL-19	R4708479
L2307649-2 P2 L							
Sampled By: TM on 10-JUL-19 @ 09:35							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	1.28		0.10	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	1.36		0.11	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.079		0.050	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	3.93		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.108		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.278		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	40.0		2.0	mg/L		17-JUL-19	R4714220
Turbidity	31.2		0.10	NTU		11-JUL-19	R4708479
L2307649-3 P3 L							
Sampled By: TM on 10-JUL-19 @ 09:50							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	1.17		0.040	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	1.24		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.074		0.020	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	20.7		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.144		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.328		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	48.7		2.0	mg/L		17-JUL-19	R4714220
Turbidity	37.5		0.10	NTU		11-JUL-19	R4708479

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2307649-3 P3 L							
Sampled By: TM on 10-JUL-19 @ 09:50							
Matrix: WATER							
L2307649-4 P4 L							
Sampled By: TM on 10-JUL-19 @ 10:00							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.824		0.040	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.851		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.027		0.020	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	14.9		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.091		0.010	mg/L		15-JUL-19	R4712722
Chlorine, Total	0.020	CLH	0.010	mg/L		11-JUL-19	R4708486
Oxygen, Dissolved	4.30		0.10	mg/L		11-JUL-19	R4714825
Phosphorus (P)-Total	0.273		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	17.9		2.0	mg/L		17-JUL-19	R4714220
Turbidity	13.6		0.10	NTU		11-JUL-19	R4708479
L2307649-5 P6 L							
Sampled By: TM on 10-JUL-19 @ 10:21							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.090		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.113		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.023		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	15.0		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.141		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.294		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	37.1		2.0	mg/L		17-JUL-19	R4714220
Turbidity	14.0		0.10	NTU		11-JUL-19	R4708479
L2307649-6 SL U							
Sampled By: TM on 10-JUL-19 @ 10:35							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.043		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	20.8		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2307649-6 SL U							
Sampled By: TM on 10-JUL-19 @ 10:35							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.013		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.0589		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	5.6		2.0	mg/L		17-JUL-19	R4714220
Turbidity	4.41		0.10	NTU		11-JUL-19	R4708479
L2307649-7 SL L							
Sampled By: TM on 10-JUL-19 @ 10:50							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.600		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.626		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.026		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	11.2		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.089		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.192		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	20.1		2.0	mg/L		17-JUL-19	R4714220
Turbidity	13.8		0.10	NTU		11-JUL-19	R4708479
L2307649-8 CS U							
Sampled By: TM on 10-JUL-19 @ 11:05							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.109		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.109		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	64.2		0.20	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.028		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.193		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	22.3		2.0	mg/L		17-JUL-19	R4714220
Turbidity	16.7		0.10	NTU		11-JUL-19	R4708479
L2307649-9 CS L							
Sampled By: TM on 10-JUL-19 @ 11:20							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.598		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.628		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.030		0.010	mg/L		11-JUL-19	R4709040

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2307649-9 CS L							
Sampled By: TM on 10-JUL-19 @ 11:20							
Matrix: WATER							
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	74.7		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.362		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.0990		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	62.3		2.0	mg/L		17-JUL-19	R4714220
Turbidity	51.4		0.10	NTU		11-JUL-19	R4708479
L2307649-10 BTP 1							
Sampled By: TM on 10-JUL-19 @ 13:25							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.638		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.684		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	0.046		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	5.52		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.048		0.010	mg/L		15-JUL-19	R4712722
Phosphorus (P)-Total	0.152		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	12.9		2.0	mg/L		17-JUL-19	R4714220
Turbidity	8.07		0.10	NTU		11-JUL-19	R4708479
L2307649-11 SS A							
Sampled By: TM on 10-JUL-19 @ 12:20							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	50.3		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.315		0.010	mg/L		15-JUL-19	R4712722
Biochemical Oxygen Demand	15.7		6.0	mg/L		11-JUL-19	R4714331
Fecal Coliforms	1410		1	MPN/100mL		10-JUL-19	R4707712
Phosphorus (P)-Total	0.275		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	35.8		2.7	mg/L		11-JUL-19	R4710308
Turbidity	36.4		0.10	NTU		11-JUL-19	R4708479
Algae Identification							
Gomphonema (Bacillariophyceae)	Small amount		1.0			24-JUL-19	R4724019
Scenedesmus (Chlorophyceae)	Small amount		1.0			24-JUL-19	R4724019
Cryptomonas (Cryptophyceae)	Large amount		1.0			24-JUL-19	R4724019
Euglena (Euglenophyceae)	Small amount		1.0			24-JUL-19	R4724019

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2307649-11 SS A							
Sampled By: TM on 10-JUL-19 @ 12:20							
Matrix: WATER							
Algae Identification							
Phacus (Euglenophyceae)	Small amount		1.0			24-JUL-19	R4724019
Aphanocapsa (Cyanophyceae)	Small amount		1.0			24-JUL-19	R4724019
Merismopedia (Cyanophyceae)	Massive amount		1.0			24-JUL-19	R4724019
Microcystis (Cyanophyceae)	Small amount		1.0			24-JUL-19	R4724019
Pseudanabaena (Cyanophyceae)	Massive amount		1.0			24-JUL-19	R4724019
Limnothrix (Cyanophyceae)	Large amount		1.0			24-JUL-19	R4724019
Planktothrix (Cyanophyceae)	Massive amount		1.0			24-JUL-19	R4724019
Unidentified	Large amount		1.0			24-JUL-19	R4724019
Note: Unidentified: dispersed rod shaped single cells of an unidentified cyanobacteria							
Enumeration of blue green algae cells							
Total cyanobacterial cell count	2230000		1	cells/mL		24-JUL-19	R4724029
Aphanocapsa (Cyanophyceae)	300		1	cells/mL		24-JUL-19	R4724029
Limnothrix (Cyanophyceae)	162000		1	cells/mL		24-JUL-19	R4724029
Merismopedia (Cyanophyceae)	611000		1	cells/mL		24-JUL-19	R4724029
Planktothrix (Cyanophyceae)	505000		1	cells/mL		24-JUL-19	R4724029
Pseudanabaena (Cyanophyceae)	715000		1	cells/mL		24-JUL-19	R4724029
Unidentified blue-green	235000		1	cells/mL		24-JUL-19	R4724029
Note: Unidentified: dispersed rod shaped single cells of an unidentified cyanobacteria							
L2307649-12 SS B							
Sampled By: TM on 10-JUL-19 @ 12:10							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	15.6		0.10	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.020		0.010	mg/L		15-JUL-19	R4712722
Biochemical Oxygen Demand	4.3		2.0	mg/L		11-JUL-19	R4714331
Fecal Coliforms	1050		1	MPN/100mL		10-JUL-19	R4707712
Phosphorus (P)-Total	0.0658		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	10.1		2.0	mg/L		17-JUL-19	R4714220
Turbidity	7.82		0.10	NTU		11-JUL-19	R4708479
L2307649-13 SS C							
Sampled By: TM on 10-JUL-19 @ 12:40							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2307649-13 SS C							
Sampled By: TM on 10-JUL-19 @ 12:40							
Matrix: WATER							
Chlorophyll a by fluorometry							
Chlorophyll a	88.4		0.20	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.046		0.010	mg/L		15-JUL-19	R4712722
Fecal Coliforms	548		1	MPN/100mL		10-JUL-19	R4707712
Phosphorus (P)-Total	0.168		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	20.7		2.0	mg/L		11-JUL-19	R4710308
Turbidity	15.9		0.10	NTU		11-JUL-19	R4708479
Algae Identification							
Fragilaria (Fragilariophyceae)	Small amount		1.0			24-JUL-19	R4724019
Melosira (Coscinodiscophyceae)	Small amount		1.0			24-JUL-19	R4724019
Navicula (Bacillariophyceae)	Small amount		1.0			24-JUL-19	R4724019
Nitzschia (Bacillariophyceae)	Moderate amount		1.0			24-JUL-19	R4724019
Monoraphidium (Chlorophyceae)	Moderate amount		1.0			24-JUL-19	R4724019
Oedogonium (Chlorophyceae)	Small amount		1.0			24-JUL-19	R4724019
Pediastrum (Chlorophyceae)	Small amount		1.0			24-JUL-19	R4724019
Scenedesmus (Chlorophyceae)	Moderate amount		1.0			24-JUL-19	R4724019
Cryptomonas (Cryptophyceae)	Small amount		1.0			24-JUL-19	R4724019
Euglena (Euglenophyceae)	Small amount		1.0			24-JUL-19	R4724019
Phacus (Euglenophyceae)	Small amount		1.0			24-JUL-19	R4724019
Aphanocapsa (Cyanophyceae)	Small amount		1.0			24-JUL-19	R4724019
Gomphosphaeria (Cyanophyceae)	Small amount		1.0			24-JUL-19	R4724019
Merismopedia (Cyanophyceae)	Large amount		1.0			24-JUL-19	R4724019
Microcystis (Cyanophyceae)	Small amount		1.0			24-JUL-19	R4724019
Phormidium (Cyanophyceae)	Small amount		1.0			24-JUL-19	R4724019
Pseudanabaena (Cyanophyceae)	Small amount		1.0			24-JUL-19	R4724019
Planktolyngbya (Cyanophyceae)	Small amount		1.0			24-JUL-19	R4724019
Schroederia (Chlorophyceae)	Moderate amount		1.0			24-JUL-19	R4724019
Unidentified	Large amount		1.0			24-JUL-19	R4724019
Other	Moderate amount		1.0			24-JUL-19	R4724019
Note: Unidentified: dispersed coccoid shaped single cells of an unidentified cyanobacteria. Other: moderate amount of Cyanodictyon (Cyanophyceae), small amount of Arthrospira (Cyanophyceae).							
Enumeration of blue green algae cells							
Total cyanobacterial cell count	358000		1	cells/mL		24-JUL-19	R4724029
Aphanocapsa (Cyanophyceae)	2000		1	cells/mL		24-JUL-19	R4724029
Gomphosphaeria (Cyanophyceae)	100		1	cells/mL		24-JUL-19	R4724029
Merismopedia (Cyanophyceae)	169000		1	cells/mL		24-JUL-19	R4724029
Microcystis (Cyanophyceae)	2200		1	cells/mL		24-JUL-19	R4724029
Phormidium (Cyanophyceae)	720		1	cells/mL		24-JUL-19	R4724029
Planktolyngbya (Cyanophyceae)	990		1	cells/mL		24-JUL-19	R4724029
Pseudanabaena (Cyanophyceae)	8910		1	cells/mL		24-JUL-19	R4724029
Unidentified blue-green	129000		1	cells/mL		24-JUL-19	R4724029
Other blue-green	44600		1	cells/mL		24-JUL-19	R4724029
Note: Unidentified: dispersed coccoid shaped single cells of an unidentified cyanobacteria. Other: Cyanodictyon (Cyanophyceae).							
L2307649-14 SS D							
Sampled By: TM on 10-JUL-19 @ 12:55							
Matrix: WATER							
Nitrate + Nitrite							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2307649-14 SS D							
Sampled By: TM on 10-JUL-19 @ 12:55							
Matrix: WATER							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		11-JUL-19	R4709040
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-JUL-19	R4709040
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	93.1		1.5	ug/L	11-JUL-19	11-JUL-19	R4720596
Miscellaneous Parameters							
Ammonia, Total (as N)	0.028		0.010	mg/L		15-JUL-19	R4712722
Fecal Coliforms	131		1	MPN/100mL		10-JUL-19	R4707712
Phosphorus (P)-Total	0.113		0.0030	mg/L		15-JUL-19	R4711474
Total Suspended Solids	34.3		2.0	mg/L		17-JUL-19	R4714220
Turbidity	12.8		0.10	NTU		11-JUL-19	R4708479

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
CLH	Free/Total Chlorine sample had headspace. Hold time for Chlorine tests is 15 minutes; field testing is recommended. Chlorine dissipates rapidly into headspace.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALGAE-CYANO-BACT-WP	Water	Enumeration of blue green algae cells	APHA 10200 C & F

Samples are prepared by sedimentation/settling and examined using a compound phase contrast inverted microscope. Cyanobacteria (also known as blue-green algae) are identified to genus and the cells are enumerated. The total cyanobacteria count is also reported.

ALGAE-ID-WP	Water	Algae Identification	Microscopic Examination

Standard Methods 10200, 2005

This procedure is applicable to the general identification of algae occurring in samples of fresh water. Samples are prepared using a sedimentation technique, and are then examined using a compound phase contrast inverted microscope. This test is a general screen of dominant types of algae. Dominant genera of algae are reported.

BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B

Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

CHL/A-ACET-FLUORO-WP	Water	Chlorophyll a by fluorometry	EPA 445.0 ACET

This analysis is done using procedures modified from EPA method 445.0. Chlorophyll a is determined by a 90 % acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.

CL2-TOTAL-WP	Water	Chlorine, Total	APHA 4500-Cl Chlorine(Residual) G (mod)

Chlorine (residual), as free or total, is analyzed using the DPD colourimetric method. The recommended hold time for these tests is 15 minutes; field testing is recommended for best results. Chlorine can be rapidly consumed by organic matter, if present, and dissipates rapidly into headspace.

EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc

FC-QT97-WP	Water	Fecal Coliform by MPN QT97	APHA 9223B QT97

This analysis is carried out using procedures adapted from APHA Method 9223B "Enzyme Substrate Coliform Test". The sample is mixed with a mixture of hydrolyzable substrates and then sealed in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the number of positive responses to a probability table.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

O2-DIS-WP	Water	Dissolved Oxygen	APHA 4500-O-C

Manganous sulphate reacts with potassium or sodium hydroxide to give a white precipitate of manganous hydroxide. In the presence of oxygen, brown manganic hydroxide is formed. Addition of sulfuric acid dissolves the manganic hydroxide, yielding manganic sulfate which reacts with iodide, releasing iodide in an amount equivalent to the original DO content. The iodide is then titrated with a standard solution of thiosulphate. Results for supersaturated samples may be biased low.

P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L

This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - 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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: RM of East St. Paul
3021 Birdshill Road
East St. Paul MB R2E 1A7
Contact: Leanne Shewchuk

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-WP	**Water**							
Batch R4714331								
WG3101856-12 LCS								
Biochemical Oxygen Demand			102.2		%		85-115	11-JUL-19
WG3101856-11 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	11-JUL-19
CHL/A-ACET-FLUORO-WP	**Water**							
Batch R4720596								
WG3111940-3 DUP		**L2307649-1**						
Chlorophyll a		2.71	3.67		ug/L	30	35	11-JUL-19
WG3111940-2 LCS								
Chlorophyll a			106.4		%		80-120	22-JUL-19
WG3111940-1 MB								
Chlorophyll a			<0.10		ug/L		0.1	11-JUL-19
CL2-TOTAL-WP	**Water**							
Batch R4708486								
WG3103154-3 DUP		**L2307649-4**						
Chlorine, Total		0.020	0.020		mg/L	0.0	15	11-JUL-19
WG3103154-2 LCS								
Chlorine, Total			105.0		%		75-125	11-JUL-19
WG3103154-1 MB								
Chlorine, Total			<0.010		mg/L		0.01	11-JUL-19
FC-QT97-WP	**Water**							
Batch R4707712								
WG3101488-2 DUP		**L2307649-12**						
Fecal Coliforms		1050	866		MPN/100mL	19	65	10-JUL-19
WG3101488-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	10-JUL-19
NH3-COL-WP	**Water**							
Batch R4712722								
WG3106545-2 LCS								
Ammonia, Total (as N)			100.2		%		85-115	15-JUL-19
WG3106545-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	15-JUL-19
NO2-IC-N-WP	**Water**							
Batch R4709040								
WG3102280-2 LCS								
Nitrite (as N)			100.8		%		90-110	11-JUL-19
WG3102280-6 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-WP	**Water**							
Batch R4709040								
WG3102280-6 LCS								
Nitrite (as N)			99.8		%		90-110	11-JUL-19
WG3102280-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	11-JUL-19
WG3102280-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	11-JUL-19
NO3-IC-N-WP	**Water**							
Batch R4709040								
WG3102280-2 LCS								
Nitrate (as N)			99.8		%		90-110	11-JUL-19
WG3102280-6 LCS								
Nitrate (as N)			99.5		%		90-110	11-JUL-19
WG3102280-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	11-JUL-19
WG3102280-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	11-JUL-19
O2-DIS-WP	**Water**							
Batch R4714825								
WG3107252-2 LCS								
Oxygen, Dissolved			98.9		%		85-115	11-JUL-19
WG3107252-1 MB								
Oxygen, Dissolved			<0.10		mg/L		0.1	11-JUL-19
P-T-COL-WP	**Water**							
Batch R4711474								
WG3103799-10 LCS								
Phosphorus (P)-Total			96.6		%		80-120	15-JUL-19
WG3103799-14 LCS								
Phosphorus (P)-Total			97.6		%		80-120	15-JUL-19
WG3103799-13 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	15-JUL-19
WG3103799-9 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	15-JUL-19
SOLIDS-TOTSUS-WP	**Water**							
Batch R4710308								
WG3101355-6 LCS								
Total Suspended Solids			95.8		%		85-115	11-JUL-19
WG3101355-5 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TOTSUS-WP	**Water**							
Batch R4710308								
WG3101355-5 MB								
Total Suspended Solids			<2.0		mg/L		2	11-JUL-19
Batch R4714220								
WG3106450-2 LCS								
Total Suspended Solids			86.4		%		85-115	17-JUL-19
WG3106450-1 MB								
Total Suspended Solids			<2.0		mg/L		2	17-JUL-19
TURBIDITY-WP	**Water**							
Batch R4708479								
WG3103133-2 LCS								
Turbidity			103.0		%		85-115	11-JUL-19
WG3103133-1 MB								
Turbidity			<0.10		NTU		0.1	11-JUL-19

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
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

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Dissolved Oxygen							
	4	10-JUL-19 10:00	11-JUL-19 15:24	8.0	30	hours	EHTL
Inorganic Parameters							
Chlorine, Total							
	4	10-JUL-19 10:00	11-JUL-19 10:00	0.25	24	hours	EHTR-FM
Taxonomy							
Algae Identification							
	11	10-JUL-19 12:20	24-JUL-19 12:00	7	14	days	EHT
	13	10-JUL-19 12:40	24-JUL-19 12:00	7	14	days	EHT

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2307649 were received on 10-JUL-19 15:55.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2307649-COFC

COC Number: 17 -

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7

Report Form	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	leanne.shewchuk@eaststpaul.com
Email 2	operations@eaststpaul.com
Email 3	

Invoice To		
	Same as Report To	☑ YES ☐ NO
	Copy of Invoice with Report	☑ YES ☐ NO
Company:		
Contact:		

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☑ FAX
Email 1 or Fax	operations@eaststpaul.com
Email 2	

Project Information	
ALS Account # / Quote #:	Q74289
Job #:	
PO / AFE:	
LSD:	
ALS Lab Work Order # (lab use only):	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	
ALS Contact: Connor Cattani	Sampler: TM

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	BOD	FECALS					SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	P1 U	10-Jul-19	9:15	Water	3	R	R		R	R		R	R								
	P2 L	10-Jul-19	9:35	Water	3	R	R		R	R		R	R								
	P3 L	10-Jul-19	9:50	Water	3	R	R		R	R		R	R								
	P4 L	10-Jul-19	10:00	Water	5	R	R	R	R	R	R	R	R								
	P6 L	10-Jul-19	10:21	Water	3	R	R		R	R		R	R								
	SL U	10-Jul-19	10:35	Water	3	R	R		R	R		R	R								
	SL L	10-Jul-19	10:50	Water	3	R	R		R	R		R	R								
	CS U	10-Jul-19	11:05	Water	3	R	R		R	R		R	R								
	CS L	10-Jul-19	11:20	Water	3	R	R		R	R		R	R								
	BTP 1	10-Jul-19	1:25	Water	3	R	R		R	R		R	R								
	SS A	10-Jul-19	12:20	Water	5	R	R		R	R		R	R	R	R						
	SS B	10-Jul-19	12:10	Water	5	R	R		R	R		R	R	R	R						

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
16.4							

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by: APL	Date: 10/7/19	Time: 3:35

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2307649-COFC

COC Number: 17 -

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7

Report F	
Select Report Format:	☑
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	leanne.shewchuk@eaststpaul.com
Email 2	operations@eaststpaul.com
Email 3	

Invoice To		
	Same as Report To	☑ YES ☐ NO
	Copy of Invoice with Report	☑ YES ☐ NO
Company:		
Contact:		

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	operations@eaststpaul.com
Email 2	

Project Information	
ALS Account # / Quote #:	Q74289
Job #:	
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Connor Cattani Sampler: TM

Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	BOD	FECALS					SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	SS C	10-Jul-19	12:40	Water	4	R	R		R	R		R	R		R						
	SS D	10-Jul-19	12:55	Water	4	R	R		R	R		R	R		R						

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
16.0							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: ANC	Date: 10/7/19	Time: 3:55	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1 If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

RM of East St. Paul
ATTN: Leanne Shewchuk
3021 Birdshill Road
East St. Paul MB R2E 1A7

Date Received: 24-JUL-19
Report Date: 07-AUG-19 15:24 (MT)
Version: FINAL

Client Phone: 204-668-8112

Certificate of Analysis

Lab Work Order #: L2316302

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2316302-1 SS A							
Sampled By: TM on 24-JUL-19 @ 09:30							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	78.8		0.10	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.028		0.010	mg/L		25-JUL-19	R4727748
Biochemical Oxygen Demand	11.1		2.0	mg/L		25-JUL-19	R4731628
Fecal Coliforms	45		1	MPN/100mL		24-JUL-19	R4724888
Phosphorus (P)-Total	0.211		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	26.0		2.0	mg/L		31-JUL-19	R4734288
Turbidity	20.0		0.10	NTU		25-JUL-19	R4727347
L2316302-2 SS B							
Sampled By: TM on 24-JUL-19 @ 09:17							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	27.9		0.10	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.019		0.010	mg/L		25-JUL-19	R4727748
Fecal Coliforms	<1		1	MPN/100mL		24-JUL-19	R4724888
Phosphorus (P)-Total	0.0839		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	13.1		2.0	mg/L		31-JUL-19	R4734288
Turbidity	6.76		0.10	NTU		25-JUL-19	R4727347
L2316302-3 SS C							
Sampled By: TM on 24-JUL-19 @ 09:45							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	66.7		0.10	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.023		0.010	mg/L		25-JUL-19	R4727748

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2316302-3 SS C							
Sampled By: TM on 24-JUL-19 @ 09:45							
Matrix: WATER							
Biochemical Oxygen Demand	6.0		2.0	mg/L		25-JUL-19	R4731628
Fecal Coliforms	7		1	MPN/100mL		24-JUL-19	R4724888
Phosphorus (P)-Total	0.220		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	28.4		2.0	mg/L		31-JUL-19	R4734288
Turbidity	25.4		0.10	NTU		25-JUL-19	R4727347
L2316302-4 SS D							
Sampled By: TM on 24-JUL-19 @ 10:00							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	36.8		0.10	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.029		0.010	mg/L		25-JUL-19	R4727748
Fecal Coliforms	3		1	MPN/100mL		24-JUL-19	R4724888
Phosphorus (P)-Total	0.133		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	54.4		2.0	mg/L		31-JUL-19	R4734288
Turbidity	15.4		0.10	NTU		25-JUL-19	R4727347
L2316302-5 CS U							
Sampled By: TM on 24-JUL-19 @ 10:57							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	5.99		0.10	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.026		0.010	mg/L		25-JUL-19	R4727748
Phosphorus (P)-Total	0.151		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	5.3		2.0	mg/L		31-JUL-19	R4734288
Turbidity	2.21		0.10	NTU		25-JUL-19	R4727347
L2316302-6 CS L							
Sampled By: TM on 24-JUL-19 @ 11:10							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2316302-6 CS L							
Sampled By: TM on 24-JUL-19 @ 11:10							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	46.6		0.10	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.037		0.010	mg/L		25-JUL-19	R4727748
Oxygen, Dissolved	10.2		0.10	mg/L		24-JUL-19	R4728608
Phosphorus (P)-Total	0.166		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	49.3		3.3	mg/L		31-JUL-19	R4734288
Turbidity	28.9		0.10	NTU		25-JUL-19	R4727347
L2316302-7 BTP 1							
Sampled By: TM on 24-JUL-19 @ 10:40							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	3.17		0.10	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.027		0.010	mg/L		25-JUL-19	R4727748
Phosphorus (P)-Total	0.0293		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	<2.0		2.0	mg/L		31-JUL-19	R4734288
Turbidity	1.13		0.10	NTU		25-JUL-19	R4727347
L2316302-8 S U							
Sampled By: TM on 24-JUL-19 @ 11:50							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	93.0		0.20	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.072		0.010	mg/L		25-JUL-19	R4727748
Phosphorus (P)-Total	0.554		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	42.7		2.0	mg/L		31-JUL-19	R4734288
Turbidity	5.24		0.10	NTU		25-JUL-19	R4727347
L2316302-9 S L							
Sampled By: TM on 24-JUL-19 @ 11:40							
Matrix: WATER							
Nitrate + Nitrite							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2316302-9 S L							
Sampled By: TM on 24-JUL-19 @ 11:40							
Matrix: WATER							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	17.2		0.10	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.020		0.010	mg/L		25-JUL-19	R4727748
Phosphorus (P)-Total	0.0577		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	21.7		2.0	mg/L		31-JUL-19	R4734288
Turbidity	7.49		0.10	NTU		25-JUL-19	R4727347
L2316302-10 P1 U							
Sampled By: TM on 24-JUL-19 @ 12:40							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	62.4		0.20	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.071		0.010	mg/L		25-JUL-19	R4727748
Oxygen, Dissolved	3.30		0.10	mg/L		24-JUL-19	R4728608
Phosphorus (P)-Total	0.189		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	82.7		2.0	mg/L		31-JUL-19	R4734288
Turbidity	22.4		0.10	NTU		25-JUL-19	R4727347
L2316302-11 P2 L							
Sampled By: TM on 24-JUL-19 @ 12:50							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	55.9		0.20	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.126		0.010	mg/L		25-JUL-19	R4727748
Phosphorus (P)-Total	0.197		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	11.9		2.0	mg/L		31-JUL-19	R4734288
Turbidity	4.31		0.10	NTU		25-JUL-19	R4727347

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2316302-11 P2 L							
Sampled By: TM on 24-JUL-19 @ 12:50							
Matrix: WATER							
L2316302-12 P3 L							
Sampled By: TM on 24-JUL-19 @ 12:25							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	69.1		0.20	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.112		0.010	mg/L		25-JUL-19	R4727748
Phosphorus (P)-Total	0.807		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	55.7		2.0	mg/L		31-JUL-19	R4734288
Turbidity	19.6		0.10	NTU		25-JUL-19	R4727347
L2316302-13 P4 L							
Sampled By: TM on 24-JUL-19 @ 12:15							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	30.9		0.20	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.089		0.010	mg/L		25-JUL-19	R4727748
Phosphorus (P)-Total	0.190		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	8.3		2.0	mg/L		31-JUL-19	R4734288
Turbidity	2.50		0.10	NTU		25-JUL-19	R4727347
L2316302-14 P6 L							
Sampled By: TM on 24-JUL-19 @ 12:05							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		25-JUL-19	R4730558
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		30-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		25-JUL-19	R4730558
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	24.2		0.20	ug/L	25-JUL-19	25-JUL-19	R4742723
Miscellaneous Parameters							
Ammonia, Total (as N)	0.024		0.010	mg/L		26-JUL-19	R4729344

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2316302-14 P6 L							
Sampled By: TM on 24-JUL-19 @ 12:05							
Matrix: WATER							
Phosphorus (P)-Total	0.208		0.0030	mg/L		31-JUL-19	R4731768
Total Suspended Solids	43.2		2.0	mg/L		31-JUL-19	R4734288
Turbidity	19.4		0.10	NTU		25-JUL-19	R4727347

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B
Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.			
CHL/A-ACET-FLUORO-WP	Water	Chlorophyll a by fluorometry	EPA 445.0 ACET
This analysis is done using procedures modified from EPA method 445.0. Chlorophyll a is determined by a 90 % acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
FC-QT97-WP	Water	Fecal Coliform by MPN QT97	APHA 9223B QT97
This analysis is carried out using procedures adapted from APHA Method 9223B "Enzyme Substrate Coliform Test". The sample is mixed with a mixture of hydrolyzable substrates and then sealed in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the number of positive responses to a probability table.			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
O2-DIS-WP	Water	Dissolved Oxygen	APHA 4500-O-C
Manganous sulphate reacts with potassium or sodium hydroxide to give a white precipitate of manganous hydroxide. In the presence of oxygen, brown manganic hydroxide is formed. Addition of sulfuric acid dissolves the manganic hydroxide, yielding manganic sulfate which reacts with iodide, releasing iodide in an amount equivalent to the original DO content. The iodide is then titrated with a standard solution of thiosulphate. Results for supersaturated samples may be biased low.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - 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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2316302 Report Date: 07-AUG-19

Client: RM of East St. Paul
3021 Birdshill Road
East St. Paul MB R2E 1A7
Contact: Leanne Shewchuk

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-WP	**Water**							
Batch R4731628								
WG3114845-12 LCS								
Biochemical Oxygen Demand			103.0		%		85-115	25-JUL-19
WG3114845-11 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	25-JUL-19
CHL/A-ACET-FLUORO-WP	**Water**							
Batch R4742723								
WG3124934-2 LCS								
Chlorophyll a			107.5		%		80-120	06-AUG-19
WG3124934-1 MB								
Chlorophyll a			<0.10		ug/L		0.1	25-JUL-19
FC-QT97-WP	**Water**							
Batch R4724888								
WG3114541-2 DUP		**L2316302-1**						
Fecal Coliforms		45	30		MPN/100mL	41	65	24-JUL-19
WG3114541-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	24-JUL-19
NH3-COL-WP	**Water**							
Batch R4727748								
WG3116506-10 LCS								
Ammonia, Total (as N)			101.4		%		85-115	25-JUL-19
WG3116506-9 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	25-JUL-19
Batch R4729344								
WG3118122-2 LCS								
Ammonia, Total (as N)			104.0		%		85-115	26-JUL-19
WG3118122-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	26-JUL-19
NO2-IC-N-WP	**Water**							
Batch R4730558								
WG3115270-10 LCS								
Nitrite (as N)			98.3		%		90-110	25-JUL-19
WG3115270-9 MB								
Nitrite (as N)			<0.010		mg/L		0.01	25-JUL-19
NO3-IC-N-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-WP	**Water**							
Batch R4730558								
WG3115270-10 LCS								
Nitrate (as N)			96.7		%		90-110	25-JUL-19
WG3115270-9 MB								
Nitrate (as N)			<0.020		mg/L		0.02	25-JUL-19
O2-DIS-WP	**Water**							
Batch R4728608								
WG3117330-2 LCS								
Oxygen, Dissolved			94.7		%		85-115	24-JUL-19
WG3117330-1 MB								
Oxygen, Dissolved			<0.10		mg/L		0.1	24-JUL-19
P-T-COL-WP	**Water**							
Batch R4731768								
WG3119582-2 LCS								
Phosphorus (P)-Total			102.5		%		80-120	31-JUL-19
WG3119582-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	31-JUL-19
SOLIDS-TOTSUS-WP	**Water**							
Batch R4734288								
WG3119451-2 LCS								
Total Suspended Solids			94.4		%		85-115	31-JUL-19
WG3119451-1 MB								
Total Suspended Solids			<2.0		mg/L		2	31-JUL-19
TURBIDITY-WP	**Water**							
Batch R4727347								
WG3116063-5 LCS								
Turbidity			99.98		%		85-115	25-JUL-19
WG3116063-4 MB								
Turbidity			<0.10		NTU		0.1	25-JUL-19

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS www.alsglobal.com

Chain of C … **Canad**

L2316302-COFC

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…b use only)

COC Number: 17 -

Page 1 of 2

Report To	Contact and company name below will appear on the final report	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Company:	RM of East St. Paul	Quality Control (QC) Report with Report ☐ YES ☐ NO
Contact:	Leanne Shewchuk	☐ Compare Results to Criteria on Report - provide details below if box checked
Phone:	204-668-8112 x 4503	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
	Company address below will appear on the final report	Email 1 or Fax leanne.shewchuk@eaststpaul.com
Street:	3021 Birdshill Road	Email 2 operations@eaststpaul.com
City/Province:	East St. Paul, MB	Email 3
Postal Code:	R2E 1A7	
Invoice To	Same as Report To ☑ YES ☐ NO	**Invoice Distribution**
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☑ FAX
Company:		Email 1 or Fax operations@eaststpaul.com
Contact:		Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q74289	AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact: Connor Cattani	Sampler: TM

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
	4 day [P4-20%] ☐		1 Business day [E - 100%] ☐
	3 day [P3-25%] ☐		Same Day, Weekend or Statutory holiday [E2 -200%] ☐
	2 day [P2-50%] ☐		(Laboratory opening fees may apply)]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	BOD	FECALS	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
					Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below												
	SS A	24-Jul-19	9:30	Water	5	R	R		R	R		R	R	R	R		
	SS B	24-Jul-19	9:17	Water	4	R	R		R	R		R	R		R		
	SS C	24-Jul-19	9:45	Water	5	R	R		R	R		R	R	R	R		
	SS D	24-Jul-19	10:00	Water	4	R	R		R	R		R	R		R		
	CS U	24-Jul-19	10:57	Water	3	R	R		R	R		R	R				
	CS L	24-Jul-19	11:10	Water	4	R	R	R	R	R		R	R				
	BTP 1	24-Jul-19	10:40	Water	3	R	R		R	R		R	R				
	S U	24-Jul-19	11:50	Water	3	R	R		R	R		R	R				
	S L	24-Jul-19	11:40	Water	3	R	R		R	R		R	R				
	P1 U	24-Jul-19	12:40	Water	4	R	R	R	R	R		R	R				
	P2 L	24-Jul-19	12:50	Water	3	R	R		R	R		R	R				
	P3 L	24-Jul-19	12:25	Water	3	R	R		R	R		R	R				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
-20.7							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: JH	Date: July 24	Time: 4:07	Received by: CEL	Date:	Time: 4:06

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION. WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2316302-COFC

COC Number: 17 -

Page 2 of 2

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Contact your AM to confirm all E&P TATs (surcharges may apply)
Company:	RM of East St. Paul	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Leanne Shewchuk	Quality Control (QC) Report with Report ☐ YES ☐ NO	PRIORITY (Business Days): 4 day [P4-20%] ☐ / 3 day [P3-25%] ☐ / 2 day [P2-50%] ☐
Phone:	204-668-8112 x 4503	☐ Compare Results to Criteria on Report - provide details below if box checked	EMERGENCY: 1 Business day [E - 100%] ☐ / Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Street:	3021 Birdshill Road	Email 1 or Fax: leanne.shewchuk@eaststpaul.com	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
City/Province:	East St. Paul, MB	Email 2: operations@eaststpaul.com	For tests that can not be performed according to the service level selected, you will be contacted.
Postal Code:	R2E 1A7	Email 3:	
Invoice To	Same as Report To ☑ YES ☐ NO	**Invoice Distribution**	**Analysis Request**
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Company:		Email 1 or Fax: operations@eaststpaul.com	
Contact:		Email 2:	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q74289	AFE/Cost Center:	PO#:
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact: Connor Cattani	Sampler: TM

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	BOD	FECALS	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	P4 L	24-Jul-19	12:15	Water	3	R	R		R	R		R	R				
	P6 L	24-Jul-19	12:05	Water	3	R	R		R	R		R	R				

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐		SIF Observations	Yes ☐	No ☐	
Ice Packs ☐	Ice Cubes ☐	Custody seal intact	Yes ☐	No ☐	
Cooling Initiated ☐					

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
20.2							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: JH	Date: July 24	Time: 4:07	Received by: CEL	Date:	Time: 4:06

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

RM of East St. Paul
ATTN: Leanne Shewchuk
3021 Birdshill Road
East St. Paul MB R2E 1A7

Date Received: 07-AUG-19
Report Date: 21-AUG-19 13:14 (MT)
Version: FINAL

Client Phone: 204-668-8112

Certificate of Analysis

Lab Work Order #: L2324295

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2324295-1 SS A							
Sampled By: TM on 07-AUG-19 @ 09:30							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		09-AUG-19	R4750115
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		09-AUG-19	R4750115
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	109		0.20	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.065		0.010	mg/L		12-AUG-19	R4751433
Fecal Coliforms	84		1	MPN/100mL		07-AUG-19	R4744466
Phosphorus (P)-Total	0.218		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	29.2		2.0	mg/L		14-AUG-19	R4754769
Turbidity	30.9		0.10	NTU		08-AUG-19	R4744903
Algae Identification							
Scenedesmus (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Cryptomonas (Cryptophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Small Chrysophytes (Chrysophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Euglena (Euglenophyceae)	Small amount		1.0			09-AUG-19	R4746767
Phacus (Euglenophyceae)	Small amount		1.0			09-AUG-19	R4746767
Aphanizomenon (Cyanophyceae)	Small amount		1.0			09-AUG-19	R4746767
Merismopedia (Cyanophyceae)	Large amount		1.0			09-AUG-19	R4746767
Microcystis (Cyanophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Pseudanabaena (Cyanophyceae)	Massive amount		1.0			09-AUG-19	R4746767
Limnothrix (Cyanophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Planktothrix (Cyanophyceae)	Large amount		1.0			09-AUG-19	R4746767
Other	Small amount		1.0			09-AUG-19	R4746767
Note: Other: Rhopalodia (Bacillariophyceae)							
L2324295-2 SS B							
Sampled By: TM on 07-AUG-19 @ 09:20							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		09-AUG-19	R4750115
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		09-AUG-19	R4750115
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	31.3		0.50	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.024		0.010	mg/L		12-AUG-19	R4751433
Fecal Coliforms	<1		1	MPN/100mL		07-AUG-19	R4744466
Phosphorus (P)-Total	0.102		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	21.3		2.0	mg/L		14-AUG-19	R4754769
Turbidity	10.8		0.10	NTU		08-AUG-19	R4744903
Algae Identification							
Nitzschia (Bacillariophyceae)	Small amount		1.0			09-AUG-19	R4746767
Synedra (Fragilariophyceae)	Small amount		1.0			09-AUG-19	R4746767

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2324295-2 SS B							
Sampled By: TM on 07-AUG-19 @ 09:20							
Matrix: WATER							
Algae Identification							
Chlamydomonas (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Cosmarium (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Dictyosphaerium (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Monoraphidium (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Oocystis (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Scenedesmus (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Staurastrum (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Tetraedron (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Cryptomonas (Cryptophyceae)	Small amount		1.0			09-AUG-19	R4746767
Euglena (Euglenophyceae)	Small amount		1.0			09-AUG-19	R4746767
Anabaena (Cyanophyceae)	Small amount		1.0			09-AUG-19	R4746767
Gomphosphaeria (Cyanophyceae)	Large amount		1.0			09-AUG-19	R4746767
Merismopedia (Cyanophyceae)	Massive amount		1.0			09-AUG-19	R4746767
Microcystis (Cyanophyceae)	Large amount		1.0			09-AUG-19	R4746767
Pseudanabaena (Cyanophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Planktolyngbya (Cyanophyceae)	Small amount		1.0			09-AUG-19	R4746767
Other	Small amount		1.0			09-AUG-19	R4746767
Note: Other: Rhopalodia (Bacillariophyceae)							
L2324295-3 SS C							
Sampled By: TM on 07-AUG-19 @ 09:52							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		09-AUG-19	R4750115
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		09-AUG-19	R4750115
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	82.3		0.50	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.033		0.010	mg/L		12-AUG-19	R4751433
Fecal Coliforms	28		1	MPN/100mL		07-AUG-19	R4744466
Phosphorus (P)-Total	0.258		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	41.9		2.0	mg/L		14-AUG-19	R4754769
Turbidity	36.5		0.10	NTU		08-AUG-19	R4744903
Algae Identification							
Chlamydomonas (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Closterium (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Cosmarium (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Monoraphidium (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Oocystis (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Scenedesmus (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Tetraedron (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Cryptomonas (Cryptophyceae)	Small amount		1.0			09-AUG-19	R4746767
Euglena (Euglenophyceae)	Small amount		1.0			09-AUG-19	R4746767
Aphanizomenon (Cyanophyceae)	Large amount		1.0			09-AUG-19	R4746767
Merismopedia (Cyanophyceae)	Massive amount		1.0			09-AUG-19	R4746767
Microcystis (Cyanophyceae)	Massive amount		1.0			09-AUG-19	R4746767
Phormidium (Cyanophyceae)	Small amount		1.0			09-AUG-19	R4746767

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2324295-3 SS C							
Sampled By: TM on 07-AUG-19 @ 09:52							
Matrix: WATER							
Algae Identification							
Pseudanabaena (Cyanophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Planktolyngbya (Cyanophyceae)	Large amount		1.0			09-AUG-19	R4746767
L2324295-4 SS D							
Sampled By: TM on 07-AUG-19 @ 10:05							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		09-AUG-19	R4750115
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		13-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		09-AUG-19	R4750115
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	50.1		0.50	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.027		0.010	mg/L		12-AUG-19	R4751433
Oxygen, Dissolved	11.5		0.10	mg/L		08-AUG-19	R4744914
Fecal Coliforms	<1		1	MPN/100mL		07-AUG-19	R4744466
Phosphorus (P)-Total	0.200		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	120		6.0	mg/L		14-AUG-19	R4754769
Turbidity	24.1		0.10	NTU		08-AUG-19	R4744903
Algae Identification							
Cosmarium (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Monoraphidium (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Oocystis (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Pediastrum (Chlorophyceae)	Small amount		1.0			09-AUG-19	R4746767
Scenedesmus (Chlorophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Cryptomonas (Cryptophyceae)	Small amount		1.0			09-AUG-19	R4746767
Euglena (Euglenophyceae)	Small amount		1.0			09-AUG-19	R4746767
Phacus (Euglenophyceae)	Small amount		1.0			09-AUG-19	R4746767
Aphanizomenon (Cyanophyceae)	Small amount		1.0			09-AUG-19	R4746767
Chroococcus (Cyanophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Gomphosphaeria (Cyanophyceae)	Large amount		1.0			09-AUG-19	R4746767
Merismopedia (Cyanophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Microcystis (Cyanophyceae)	Small amount		1.0			09-AUG-19	R4746767
Pseudanabaena (Cyanophyceae)	Small amount		1.0			09-AUG-19	R4746767
Gymnodinium (Dinophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Planktolyngbya (Cyanophyceae)	Moderate amount		1.0			09-AUG-19	R4746767
Other	Small amount		1.0			09-AUG-19	R4746767
Note: Other: Eucapsis (Cyanophyceae)							
L2324295-5 CS U							
Sampled By: TM on 07-AUG-19 @ 12:37							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		09-AUG-19	R4752545

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2324295-5 CS U							
Sampled By: TM on 07-AUG-19 @ 12:37							
Matrix: WATER							
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	5.60		0.10	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.028		0.010	mg/L		12-AUG-19	R4751433
Phosphorus (P)-Total	0.191		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	3.7		2.0	mg/L		14-AUG-19	R4754769
Turbidity	2.37		0.10	NTU		08-AUG-19	R4744903
L2324295-6 CS L							
Sampled By: TM on 07-AUG-19 @ 12:50							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	24.8		0.10	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.081		0.010	mg/L		12-AUG-19	R4751433
Phosphorus (P)-Total	0.148		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	19.9		2.0	mg/L		14-AUG-19	R4754769
Turbidity	26.4		0.10	NTU		08-AUG-19	R4744903
L2324295-7 BTP 1							
Sampled By: TM on 07-AUG-19 @ 11:45							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	18.9		0.10	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.050		0.010	mg/L		12-AUG-19	R4751433
Phosphorus (P)-Total	0.0710		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	8.8		2.0	mg/L		14-AUG-19	R4754769
Turbidity	6.11		0.10	NTU		08-AUG-19	R4744903
L2324295-8 S U							
Sampled By: TM on 07-AUG-19 @ 12:05							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2324295-8 S U							
Sampled By: TM on 07-AUG-19 @ 12:05							
Matrix: WATER							
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	72.4		0.20	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.021		0.010	mg/L		12-AUG-19	R4751433
Phosphorus (P)-Total	0.119		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	20.9		2.0	mg/L		14-AUG-19	R4754769
Turbidity	11.6		0.10	NTU		08-AUG-19	R4744903
L2324295-9 S L							
Sampled By: TM on 07-AUG-19 @ 12:20							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	12.1		0.10	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.026		0.010	mg/L		12-AUG-19	R4751433
Phosphorus (P)-Total	0.0595		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	35.3		2.0	mg/L		14-AUG-19	R4754769
Turbidity	15.4		0.10	NTU		08-AUG-19	R4744903
L2324295-10 P1 U							
Sampled By: TM on 07-AUG-19 @ 10:40							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	27.1		0.10	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.068		0.010	mg/L		12-AUG-19	R4751433
Fecal Coliforms	687		1	MPN/100mL		07-AUG-19	R4744466
Phosphorus (P)-Total	0.217		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	17.7		2.0	mg/L		14-AUG-19	R4754769
Turbidity	4.61		0.10	NTU		08-AUG-19	R4744903

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2324295-11 P2 L							
Sampled By: TM on 07-AUG-19 @ 10:50							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	57.2		0.20	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.073		0.010	mg/L		12-AUG-19	R4751433
Phosphorus (P)-Total	0.581		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	23.2		2.0	mg/L		14-AUG-19	R4754769
Turbidity	4.43		0.10	NTU		08-AUG-19	R4744903
L2324295-12 P3 L							
Sampled By: TM on 07-AUG-19 @ 11:20							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	477		1.0	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.060		0.020	mg/L		13-AUG-19	R4753069
Phosphorus (P)-Total	0.635		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	56.0		2.0	mg/L		14-AUG-19	R4754769
Turbidity	15.9		0.10	NTU		08-AUG-19	R4744903
L2324295-13 P4 L							
Sampled By: TM on 07-AUG-19 @ 11:06							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	138		0.20	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.042		0.010	mg/L		12-AUG-19	R4751433
Phosphorus (P)-Total	0.535		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	60.0		2.0	mg/L		14-AUG-19	R4754769
Turbidity	25.5		0.10	NTU		08-AUG-19	R4744903

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2324295-13 P4 L							
Sampled By: TM on 07-AUG-19 @ 11:06							
Matrix: WATER							
L2324295-14 P6 L							
Sampled By: TM on 07-AUG-19 @ 11:35							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		09-AUG-19	R4752545
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		14-AUG-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		09-AUG-19	R4752545
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	51.3		0.50	ug/L	08-AUG-19	08-AUG-19	R4762235
Miscellaneous Parameters							
Ammonia, Total (as N)	0.107		0.010	mg/L		12-AUG-19	R4751433
Phosphorus (P)-Total	0.312		0.0030	mg/L		09-AUG-19	R4745230
Total Suspended Solids	210		3.3	mg/L		14-AUG-19	R4754769
Turbidity	107		0.10	NTU		08-AUG-19	R4744903

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALGAE-ID-WP	Water	Algae Identification	Microscopic Examination
Standard Methods 10200, 2005			
This procedure is applicable to the general identification of algae occurring in samples of fresh water. Samples are prepared using a sedimentation technique, and are then examined using a compound phase contrast inverted microscope. This test is a general screen of dominant types of algae. Dominant genera of algae are reported.			
CHL/A-ACET-FLUORO-WP	Water	Chlorophyll a by fluorometry	EPA 445.0 ACET
This analysis is done using procedures modified from EPA method 445.0. Chlorophyll a is determined by a 90 % acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
FC-QT97-WP	Water	Fecal Coliform by MPN QT97	APHA 9223B QT97
This analysis is carried out using procedures adapted from APHA Method 9223B "Enzyme Substrate Coliform Test". The sample is mixed with a mixture of hydrolyzable substrates and then sealed in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the number of positive responses to a probability table.			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
O2-DIS-WP	Water	Dissolved Oxygen	APHA 4500-O-C
Manganous sulphate reacts with potassium or sodium hydroxide to give a white precipitate of manganous hydroxide. In the presence of oxygen, brown manganic hydroxide is formed. Addition of sulfuric acid dissolves the manganic hydroxide, yielding manganic sulfate which reacts with iodide, releasing iodide in an amount equivalent to the original DO content. The iodide is then titrated with a standard solution of thiosulphate. Results for supersaturated samples may be biased low.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - 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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2324295 Report Date: 21-AUG-19

Client: RM of East St. Paul
3021 Birdshill Road
East St. Paul MB R2E 1A7
Contact: Leanne Shewchuk

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CHL/A-ACET-FLUORO-WP	**Water**							
Batch R4762235								
WG3138205-3 DUP		**L2324295-5**						
Chlorophyll a		5.60	6.16		ug/L	9.5	35	08-AUG-19
WG3138205-2 LCS								
Chlorophyll a			105.9		%		80-120	20-AUG-19
WG3138205-1 MB								
Chlorophyll a			<0.10		ug/L		0.1	08-AUG-19
FC-QT97-WP	**Water**							
Batch R4744466								
WG3126316-2 DUP		**L2324295-1**						
Fecal Coliforms		84	54		MPN/100mL	43	65	07-AUG-19
WG3126316-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	07-AUG-19
NH3-COL-WP	**Water**							
Batch R4751433								
WG3131497-2 LCS								
Ammonia, Total (as N)			100.0		%		85-115	12-AUG-19
WG3131497-22 LCS								
Ammonia, Total (as N)			100.6		%		85-115	12-AUG-19
WG3131497-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	12-AUG-19
WG3131497-21 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	12-AUG-19
Batch R4753069								
WG3132727-2 LCS								
Ammonia, Total (as N)			95.6		%		85-115	13-AUG-19
WG3132727-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	13-AUG-19
NO2-IC-N-WP	**Water**							
Batch R4750115								
WG3128328-2 LCS								
Nitrite (as N)			99.4		%		90-110	09-AUG-19
WG3128328-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	09-AUG-19
Batch R4752545								
WG3128319-2 LCS								
Nitrite (as N)			102.2		%		90-110	09-AUG-19
WG3128319-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	09-AUG-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-WP	**Water**							
Batch R4750115								
WG3128328-2 LCS								
Nitrate (as N)			98.2		%		90-110	09-AUG-19
WG3128328-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	09-AUG-19
Batch R4752545								
WG3128319-2 LCS								
Nitrate (as N)			98.6		%		90-110	09-AUG-19
WG3128319-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	09-AUG-19
O2-DIS-WP	**Water**							
Batch R4744914								
WG3127931-2 LCS								
Oxygen, Dissolved			101.3		%		85-115	08-AUG-19
WG3127931-1 MB								
Oxygen, Dissolved			<0.10		mg/L		0.1	08-AUG-19
P-T-COL-WP	**Water**							
Batch R4745230								
WG3127329-27 DUP		**L2324295-14**						
Phosphorus (P)-Total		0.312	0.326		mg/L	4.3	20	09-AUG-19
WG3127329-22 LCS								
Phosphorus (P)-Total			103.7		%		80-120	09-AUG-19
WG3127329-26 LCS								
Phosphorus (P)-Total			98.2		%		80-120	09-AUG-19
WG3127329-21 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	09-AUG-19
WG3127329-25 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	09-AUG-19
SOLIDS-TOTSUS-WP	**Water**							
Batch R4754769								
WG3131146-2 LCS								
Total Suspended Solids			104.9		%		85-115	14-AUG-19
WG3131146-1 MB								
Total Suspended Solids			<2.0		mg/L		2	14-AUG-19
TURBIDITY-WP	**Water**							

Quality Control Report

Workorder: L2324295 Report Date: 21-AUG-19

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-WP	**Water**							
Batch R4744903								
WG3127403-2 LCS								
Turbidity			104.5		%		85-115	08-AUG-19
WG3127403-1 MB								
Turbidity			<0.10		NTU		0.1	08-AUG-19

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
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

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Dissolved Oxygen							
	4	07-AUG-19 10:05	08-AUG-19 08:45	8.0	23	hours	EHTL

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2324295 were received on 07-AUG-19 16:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2324295-COFC

COC Number: 17 -

Report To	Contact and company name below will appear on the final report	Report Format / Di
Company:	RM of East St. Paul	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Contact:	Leanne Shewchuk	Quality Control (QC) Report with Report ☐ YES ☐ NO
Phone:	204-668-8112 x 4503	☐ Compare Results to Criteria on Report - provide details below if box checked
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Street:	3021 Birdshill Road	Email 1 or Fax leanne.shewchuk@eaststpaul.com
City/Province:	East St. Paul, MB	Email 2 operations@eaststpaul.com
Postal Code:	R2E 1A7	Email 3
Invoice To	Same as Report To ☑ YES ☐ NO	**Invoice Distribution**
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☑ FAX
Company:		Email 1 or Fax operations@eaststpaul.com
Contact:		Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q74289	AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		**ALS Contact:** Connor Cattani	**Sampler:** TM

Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	FECALS	ALGAE IDENTIFICATION	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	SS A	7-Aug-19	9:30	Water	4	R	R		R	R		R	R	R	R		
	SS B	7-Aug-19	9:20	Water	4	R	R		R	R		R	R	R	R		
	SS C	7-Aug-19	9:52	Water	4	R	R		R	R		R	R	R	R		
	SS D	7-Aug-19	10:05	Water	5	R	R	R	R	R		R	R	R	R		
	CS U	7-Aug-19	12:37	Water	3	R	R		R	R		R	R				
	CS L	7-Aug-19	12:50	Water	3	R	R		R	R		R	R				
	BTP 1	7-Aug-19	11:45	Water	3	R	R		R	R		R	R				
	S U	7-Aug-19	12:05	Water	3	R	R		R	R		R	R				
	S L	7-Aug-19	12:20	Water	3	R	R		R	R		R	R				
	P1 U	7-Aug-19	10:40	Water	4	R	R		R	R		R	R	R			
	P2 L	7-Aug-19	10:50	Water	3	R	R		R	R		R	R				
	P3 L	7-Aug-19	11:20	Water	3	R	R		R	R		R	R				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
		18.5					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: CM	Date: 7-8-19	Time: 4:00	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

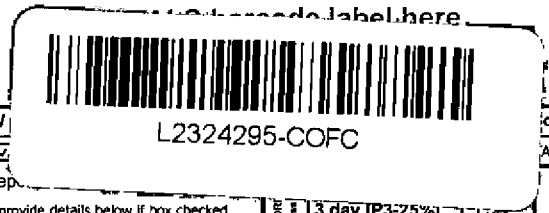
1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 17 -



Report To	Contact and company name below will appear on the final report	Report Format /
Company:	RM of East St. Paul	Select Report Format: ☑ PDF ☑
Contact:	Leanne Shewchuk	Quality Control (QC) Report with Rep
Phone:	204-668-8112 x 4503	☐ Compare Results to Criteria on Report - provide details below if box checked
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Street:	3021 Birdshill Road	Email 1 or Fax leanne.shewchuk@eaststpaul.com
City/Province:	East St. Paul, MB	Email 2 operations@eaststpaul.com
Postal Code:	R2E 1A7	Email 3
Invoice To	Same as Report To ☑ YES ☐ NO	**Invoice Distribution**
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Company:		Email 1 or Fax operations@eaststpaul.com
Contact:		Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q74289	AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		**ALS Contact:** Connor Cattani	**Sampler:** TM

PRIORITY (Business): 3 day [P3-25%] ☐ 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Contact your AM to confirm all E&P TATs (surcharges may apply)

AT if received by 3 pm - business days - no surcharges apply

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	FECALS	ALGAE IDENTIFICATION	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	P4 L	7-Aug-19	11:06	Water	3	R	R		R	R		R	R				
	P6 L	7-Aug-19	11:35	Water	3	R	R		R	R		R	R				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
		18.5					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: CM	Date: 7-8-19	Time: 4:00	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

RM of East St. Paul
ATTN: Leanne Shewchuk
3021 Birdshill Road
East St. Paul MB R2E 1A7

Date Received: 29-AUG-19
Report Date: 10-SEP-19 12:09 (MT)
Version: FINAL

Client Phone: 204-668-8112

Certificate of Analysis

Lab Work Order #: L2338601

Project P.O. #: NOT SUBMITTED
Job Reference: WATER
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338601-1 S U							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.145		0.020	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.145		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	32.2		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.063		0.010	mg/L		06-SEP-19	R4786151
Conductivity	651		1.0	umhos/cm		30-AUG-19	R4780896
Phosphorus (P)-Total	0.0786		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	11.9		2.0	mg/L		05-SEP-19	R4784577
Turbidity	7.35		0.10	NTU		30-AUG-19	R4778918
L2338601-2 S L							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	32.6		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.019		0.010	mg/L		06-SEP-19	R4786151
Fecal Coliforms	37		1	MPN/100mL		29-AUG-19	R4778222
Phosphorus (P)-Total	0.0494		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	8.0		2.0	mg/L		05-SEP-19	R4784577
Turbidity	6.50		0.10	NTU		30-AUG-19	R4778918
L2338601-3 P1 U							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	29.7		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.141		0.010	mg/L		06-SEP-19	R4786151
Conductivity	1690		1.0	umhos/cm		30-AUG-19	R4780896

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338601-3 P1 U							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Fecal Coliforms	548		1	MPN/100mL		29-AUG-19	R4778222
Phosphorus (P)-Total	0.110		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	10.1		2.0	mg/L		05-SEP-19	R4784577
Turbidity	4.90		0.10	NTU		30-AUG-19	R4778918
L2338601-4 P2 L							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.33		0.10	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.33		0.11	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	39.0		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.126		0.010	mg/L		06-SEP-19	R4786151
Phosphorus (P)-Total	0.217		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	36.1		2.0	mg/L		05-SEP-19	R4784577
Turbidity	11.1		0.10	NTU		30-AUG-19	R4778918
L2338601-5 P3 L							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	33.2		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.140		0.010	mg/L		06-SEP-19	R4786151
Phosphorus (P)-Total	0.120		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	4.7		2.0	mg/L		05-SEP-19	R4784577
Turbidity	2.80		0.10	NTU		30-AUG-19	R4778918
L2338601-6 P4 L							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		30-AUG-19	R4782488
Chlorophyll a							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338601-6 P4 L							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Chlorophyll a by fluorometry							
Chlorophyll a	23.0		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.201		0.010	mg/L		06-SEP-19	R4786151
Conductivity	1220		1.0	umhos/cm		30-AUG-19	R4780896
Phosphorus (P)-Total	0.122		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	6.1		2.0	mg/L		05-SEP-19	R4784577
Turbidity	3.60		0.10	NTU		30-AUG-19	R4778918
L2338601-7 P6 L							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	21.4		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.063		0.010	mg/L		06-SEP-19	R4786151
Fecal Coliforms	114		1	MPN/100mL		29-AUG-19	R4778222
Phosphorus (P)-Total	0.0810		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	6.0		2.0	mg/L		05-SEP-19	R4784577
Turbidity	2.02		0.10	NTU		30-AUG-19	R4778918
L2338601-8 SS A							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	187		0.40	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.037		0.010	mg/L		06-SEP-19	R4786151
Conductivity	455		1.0	umhos/cm		30-AUG-19	R4780896
Fecal Coliforms	411		1	MPN/100mL		29-AUG-19	R4778222
Phosphorus (P)-Total	0.207		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	37.9		2.0	mg/L		05-SEP-19	R4784577
Turbidity	31.1		0.10	NTU		30-AUG-19	R4778918
L2338601-9 SS B							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338601-9 SS B							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	86.3		0.70	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.194		0.010	mg/L		06-SEP-19	R4786151
Fecal Coliforms	4		1	MPN/100mL		29-AUG-19	R4778222
Phosphorus (P)-Total	0.131		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	44.7		2.0	mg/L		05-SEP-19	R4784577
Turbidity	24.3		0.10	NTU		30-AUG-19	R4778918
L2338601-10 SS C							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	97.6		0.70	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.037		0.010	mg/L		06-SEP-19	R4786151
Fecal Coliforms	308		1	MPN/100mL		29-AUG-19	R4778222
Phosphorus (P)-Total	0.198		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	46.1		2.0	mg/L		05-SEP-19	R4784577
Turbidity	32.8		0.10	NTU		30-AUG-19	R4778918
L2338601-11 SS D							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	74.3		1.0	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.103		0.010	mg/L		06-SEP-19	R4786151
Fecal Coliforms	25		1	MPN/100mL		29-AUG-19	R4778222

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338601-11 SS D							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Phosphorus (P)-Total	0.249		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	134		7.5	mg/L		05-SEP-19	R4784577
Turbidity	59.9		0.10	NTU		30-AUG-19	R4778918
L2338601-12 CS U							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	43.2		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.105		0.010	mg/L		06-SEP-19	R4786151
Conductivity	907		1.0	umhos/cm		30-AUG-19	R4780896
Phosphorus (P)-Total	0.198		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	44.3		2.0	mg/L		05-SEP-19	R4784577
Turbidity	18.1		0.10	NTU		30-AUG-19	R4778918
L2338601-13 CS L							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.051		0.040	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		30-AUG-19	R4782488
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	39.6		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.120		0.010	mg/L		06-SEP-19	R4786151
Phosphorus (P)-Total	0.140		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	12.5		2.0	mg/L		05-SEP-19	R4784577
Turbidity	14.8		0.10	NTU		30-AUG-19	R4778918
L2338601-14 BTP 1							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.048		0.040	mg/L		30-AUG-19	R4782488
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		05-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		30-AUG-19	R4782488
Chlorophyll a							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338601-14 BTP 1							
Sampled By: TM on 29-AUG-19 @ 11:10							
Matrix:							
Chlorophyll a by fluorometry							
Chlorophyll a	30.1		0.10	ug/L	29-AUG-19	29-AUG-19	R4782973
Miscellaneous Parameters							
Ammonia, Total (as N)	0.521		0.020	mg/L		06-SEP-19	R4790690
Phosphorus (P)-Total	0.136		0.0030	mg/L		03-SEP-19	R4781470
Total Suspended Solids	12.5		2.0	mg/L		05-SEP-19	R4784577
Turbidity	11.3		0.10	NTU		30-AUG-19	R4778918

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CHL/A-ACET-FLUORO-WP	Water	Chlorophyll a by fluorometry	EPA 445.0 ACET
This analysis is done using procedures modified from EPA method 445.0. Chlorophyll a is determined by a 90 % acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
EC-WP	Water	Conductivity	APHA 2510B
Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.			
FC-QT97-WP	Water	Fecal Coliform by MPN QT97	APHA 9223B QT97
This analysis is carried out using procedures adapted from APHA Method 9223B "Enzyme Substrate Coliform Test". The sample is mixed with a mixture of hydrolyzable substrates and then sealed in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the number of positive responses to a probability table.			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - 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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2338601 Report Date: 10-SEP-19

Client: RM of East St. Paul
3021 Birdshill Road
East St. Paul MB R2E 1A7

Contact: Leanne Shewchuk

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CHL/A-ACET-FLUORO-WP	**Water**							
Batch R4782973								
WG3151694-2 LCS								
Chlorophyll a			109.7		%		80-120	04-SEP-19
WG3151694-1 MB								
Chlorophyll a			<0.10		ug/L		0.1	29-AUG-19
EC-WP	**Water**							
Batch R4780896								
WG3150168-13 LCS								
Conductivity			98.9		%		90-110	30-AUG-19
WG3150168-8 LCS								
Conductivity			99.1		%		90-110	30-AUG-19
WG3150168-11 MB								
Conductivity			<1.0		umhos/cm		1	30-AUG-19
WG3150168-6 MB								
Conductivity			<1.0		umhos/cm		1	30-AUG-19
FC-QT97-WP	**Water**							
Batch R4778222								
WG3147776-2 DUP		**L2338601-2**						
Fecal Coliforms		37	37		MPN/100mL	1.1	65	29-AUG-19
WG3147776-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	29-AUG-19
NH3-COL-WP	**Water**							
Batch R4786151								
WG3154633-6 LCS								
Ammonia, Total (as N)			100.4		%		85-115	05-SEP-19
WG3154633-5 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	05-SEP-19
Batch R4790690								
WG3156239-2 LCS								
Ammonia, Total (as N)			100.2		%		85-115	06-SEP-19
WG3156239-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	06-SEP-19
NO2-IC-N-WP	**Water**							
Batch R4782488								
WG3148511-2 LCS								
Nitrite (as N)			99.99		%		90-110	30-AUG-19
WG3148511-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	30-AUG-19

Quality Control Report

Workorder: L2338601 Report Date: 10-SEP-19

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-WP	**Water**							
Batch R4782488								
WG3148511-2 LCS								
Nitrate (as N)			99.6		%		90-110	30-AUG-19
WG3148511-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	30-AUG-19
P-T-COL-WP	**Water**							
Batch R4781470								
WG3148886-10 LCS								
Phosphorus (P)-Total			94.9		%		80-120	03-SEP-19
WG3148886-6 LCS								
Phosphorus (P)-Total			94.3		%		80-120	03-SEP-19
WG3148886-5 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	03-SEP-19
WG3148886-9 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	03-SEP-19
SOLIDS-TOTSUS-WP	**Water**							
Batch R4784577								
WG3151613-18 LCS								
Total Suspended Solids			106.2		%		85-115	05-SEP-19
WG3151613-17 MB								
Total Suspended Solids			<2.0		mg/L		2	05-SEP-19
TURBIDITY-WP	**Water**							
Batch R4778918								
WG3148398-3 DUP		**L2338601-1**						
Turbidity		7.35	7.54		NTU	2.6	15	30-AUG-19
WG3148398-2 LCS								
Turbidity			103.5		%		85-115	30-AUG-19
WG3148398-1 MB								
Turbidity			<0.10		NTU		0.1	30-AUG-19

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2338601-COFC

COC Number: 17 -

Page 2 of 2

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: leanne.shewchuk@eaststpaul.com
Email 2: operations@eaststpaul.com
Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: operations@eaststpaul.com
Email 2:

Project Information

ALS Account # / Quote #: Q74289
Job #:
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#:
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (lab use only): L2338601

ALS Contact: Connor Cattani Sampler: TM

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	FECALS	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
13	CS L	29-Aug-19	11:40	Water	3	R	R		R	R		R	R			
14	BTP 1	29-Aug-19	11:57	Water	3	R	R		R	R		R	R			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO
Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
	10.5				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: CT	Date: 29-8-19	Time: 3:59	Received by:	Date: aug 29	Time: 440

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2338601-COFC

COC Number: 17 -

Page 1 of 2

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	leanne.shewchuk@eaststpaul.com
Email 2	operations@eaststpaul.com
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☑ FAX
Email 1 or Fax	operations@eaststpaul.com
Email 2	

Project Information	
ALS Account # / Quote #:	Q74289
Job #:	
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L2338601

ALS Contact: Connor Cattani Sampler: TM

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	FECALS	CONDUCTIVITY	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
1	S U	29-Aug-19	11:10	Water	3	R	R		R	R		R	R		R		
2	S L	29-Aug-19	11:20	Water	4	R	R		R	R		R	R	R			
3	P1 U	29-Aug-19	10:16	Water	4	R	R		R	R		R	R	R	R		
4	P2 L	29-Aug-19	10:25	Water	3	R	R		R	R		R	R				
5	P3 L	29-Aug-19	10:35	Water	3	R	R		R	R		R	R				
6	P4 L	29-Aug-19	10:45	Water	3	R	R		R	R		R	R		R		
7	P6 L	29-Aug-19	10:55	Water	4	R	R		R	R		R	R	R			
8	SS A	29-Aug-19	9:05	Water	4	R	R		R	R		R	R	R	R		
9	SS B	29-Aug-19	9:00	Water	4	R	R		R	R		R	R	R			
10	SS C	29-Aug-19	9:37	Water	4	R	R		R	R		R	R	R			
11	SS D	29-Aug-19	9:50	Water	4	R	R		R	R		R	R	R			
12	CS U	29-Aug-19	11:30	Water	3	R	R		R	R		R	R		R		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
	10.5				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: CM	Date: 29-8-19	Time: 3:59	Received by:	Date: aug 29	Time: 440

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

RM of East St. Paul
ATTN: Leanne Shewchuk
3021 Birdshill Road
East St. Paul MB R2E 1A7

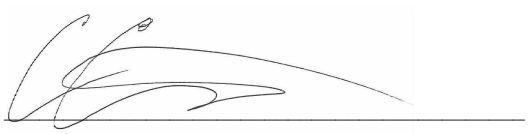
Date Received: 19-SEP-19
Report Date: 08-OCT-19 08:46 (MT)
Version: FINAL

Client Phone: 204-668-8112

Certificate of Analysis

Lab Work Order #: L2351375

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:



Connor Cattani
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351375-1 S U							
Sampled By: TM on 19-SEP-19 @ 11:15							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.097		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.097		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	122		0.50	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.156		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.100	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Conductivity	824		1.0	umhos/cm		22-SEP-19	R4835269
Phosphorus (P)-Total	0.175		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	55.6		2.0	mg/L		26-SEP-19	R4848528
Turbidity	33.1		0.10	NTU		20-SEP-19	R4838752
L2351375-2 S L							
Sampled By: TM on 19-SEP-19 @ 11:05							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	70.8		0.20	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.042		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.080	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Phosphorus (P)-Total	0.139		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	89.3		2.0	mg/L		26-SEP-19	R4848528
Turbidity	54.9		0.10	NTU		20-SEP-19	R4838752
L2351375-3 P1 U							
Sampled By: TM on 19-SEP-19 @ 10:19							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		26-SEP-19	
Nitrite in Water by IC							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351375-3 P1 U							
Sampled By: TM on 19-SEP-19 @ 10:19							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	15.2		0.10	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.262		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.070	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Conductivity	1640		1.0	umhos/cm		22-SEP-19	R4835269
Fecal Coliforms	172	MBHT	1	MPN/100mL		20-SEP-19	R4832299
Phosphorus (P)-Total	0.127		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	11.1		2.0	mg/L		26-SEP-19	R4848528
Turbidity	7.69		0.10	NTU		20-SEP-19	R4838752
L2351375-4 P2 L							
Sampled By: TM on 19-SEP-19 @ 10:25							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	70.6		0.20	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.105		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.020	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Phosphorus (P)-Total	0.227		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	34.9		2.0	mg/L		26-SEP-19	R4848528
Turbidity	4.49		0.10	NTU		20-SEP-19	R4838752
L2351375-5 P3 L							
Sampled By: TM on 19-SEP-19 @ 10:37							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351375-5 P3 L							
Sampled By: TM on 19-SEP-19 @ 10:37							
Matrix: WATER							
Chlorophyll a by fluorometry							
Chlorophyll a	4.68		0.10	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.100		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.050	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Phosphorus (P)-Total	0.0689		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	3.6		2.0	mg/L		26-SEP-19	R4848528
Turbidity	2.48		0.10	NTU		20-SEP-19	R4838752
L2351375-6 P4 L							
Sampled By: TM on 19-SEP-19 @ 10:42							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.183		0.040	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.183		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	11.2		0.10	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.251		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.030	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Phosphorus (P)-Total	0.105		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	2.3		2.0	mg/L		26-SEP-19	R4848528
Turbidity	2.34		0.10	NTU		20-SEP-19	R4838752
L2351375-7 P6 L							
Sampled By: TM on 19-SEP-19 @ 10:55							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	8.48		0.10	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.039		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.060	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351375-7 P6 L							
Sampled By: TM on 19-SEP-19 @ 10:55							
Matrix: WATER							
bottle with no headspace. Also, Total Chlorine sample had headspace.							
Conductivity	1220		1.0	umhos/cm		22-SEP-19	R4835269
Fecal Coliforms	152	MBHT	1	MPN/100mL		20-SEP-19	R4832299
Phosphorus (P)-Total	0.0630		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	29.6		2.0	mg/L		26-SEP-19	R4848528
Turbidity	5.35		0.10	NTU		20-SEP-19	R4838752
L2351375-8 SS A							
Sampled By: TM on 19-SEP-19 @ 09:20							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	164		0.50	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.033		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.020	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Fecal Coliforms	461	MBHT	1	MPN/100mL		20-SEP-19	R4832299
Phosphorus (P)-Total	0.142		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	26.9		2.0	mg/L		26-SEP-19	R4848528
Turbidity	30.7		0.10	NTU		20-SEP-19	R4838752
L2351375-9 SS B							
Sampled By: TM on 19-SEP-19 @ 09:13							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	31.3		0.10	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.050		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.050	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Conductivity	389		1.0	umhos/cm		22-SEP-19	R4835269

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351375-9 SS B							
Sampled By: TM on 19-SEP-19 @ 09:13							
Matrix: WATER							
Fecal Coliforms	21	MBHT	1	MPN/100mL		20-SEP-19	R4832299
Phosphorus (P)-Total	0.113		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	15.9		2.0	mg/L		26-SEP-19	R4848528
Turbidity	11.3		0.10	NTU		20-SEP-19	R4838752
L2351375-10 SS C							
Sampled By: TM on 19-SEP-19 @ 09:37							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	136		0.20	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.025		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.010	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Fecal Coliforms	629	MBHT	1	MPN/100mL		20-SEP-19	R4832299
Phosphorus (P)-Total	0.242		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	47.5		2.0	mg/L		26-SEP-19	R4848528
Turbidity	29.8		0.10	NTU		20-SEP-19	R4838752
L2351375-11 SS D							
Sampled By: TM on 19-SEP-19 @ 09:47							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	76.5		0.10	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.069		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.020	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Fecal Coliforms	10	MBHT	1	MPN/100mL		20-SEP-19	R4832299
Phosphorus (P)-Total	0.215		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	112		6.0	mg/L		26-SEP-19	R4848528
Turbidity	55.2		0.10	NTU		20-SEP-19	R4838752

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351375-11 SS D							
Sampled By: TM on 19-SEP-19 @ 09:47							
Matrix: WATER							
L2351375-12 CS U							
Sampled By: TM on 19-SEP-19 @ 11:30							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	7.71		0.10	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.038		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.050	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Fecal Coliforms	1	MBHT	1	MPN/100mL		20-SEP-19	R4832299
Phosphorus (P)-Total	0.156		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	5.3		2.0	mg/L		26-SEP-19	R4848528
Turbidity	4.11		0.10	NTU		20-SEP-19	R4838752
L2351375-13 CS L							
Sampled By: TM on 19-SEP-19 @ 11:38							
Matrix: WATER							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	39.1		0.20	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.027		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.050	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Conductivity	960		1.0	umhos/cm		22-SEP-19	R4835269
Phosphorus (P)-Total	0.116		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	9.7		2.0	mg/L		26-SEP-19	R4848528
Turbidity	9.63		0.10	NTU		20-SEP-19	R4838752
L2351375-14 BTP 1							
Sampled By: TM on 19-SEP-19 @ 11:53							
Matrix: WATER							
Nitrate + Nitrite							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351375-14 BTP 1							
Sampled By: TM on 19-SEP-19 @ 11:53							
Matrix: WATER							
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		21-SEP-19	R4841049
Chlorophyll a							
Chlorophyll a by fluorometry							
Chlorophyll a	88.2		0.20	ug/L	21-SEP-19	21-SEP-19	R4859789
Miscellaneous Parameters							
Ammonia, Total (as N)	0.018		0.010	mg/L		27-SEP-19	R4850813
Chlorine, Total	0.030	RRR	0.010	mg/L		21-SEP-19	R4838770
Note: RRR: Sample received in improper sampling bottle. Method requires amber glass bottle with no headspace. Also, Total Chlorine sample had headspace.							
Phosphorus (P)-Total	0.267		0.0030	mg/L		25-SEP-19	R4839654
Total Suspended Solids	25.9		2.0	mg/L		26-SEP-19	R4848528
Turbidity	28.6		0.10	NTU		20-SEP-19	R4838752

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MBHT	The APHA 30 hour hold time was exceeded for microbiological testing. Samples processed within 48 hours from time of sampling may be valid in some cases (refer to Health Canada guidance).
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CHL/A-ACET-FLUORO-WP	Water	Chlorophyll a by fluorometry	EPA 445.0 ACET
This analysis is done using procedures modified from EPA method 445.0. Chlorophyll a is determined by a 90 % acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.			
CL2-TOTAL-WP	Water	Chlorine, Total	APHA 4500-Cl Chlorine(Residual) G (mod)
Chlorine (residual), as free or total, is analyzed using the DPD colourimetric method. The recommended hold time for these tests is 15 minutes; field testing is recommended for best results. Chlorine can be rapidly consumed by organic matter, if present, and dissipates rapidly into headspace.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
EC-WP	Water	Conductivity	APHA 2510B
Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.			
FC-QT97-WP	Water	Fecal Coliform by MPN QT97	APHA 9223B QT97
This analysis is carried out using procedures adapted from APHA Method 9223B "Enzyme Substrate Coliform Test". The sample is mixed with a mixture of hydrolyzable substrates and then sealed in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the number of positive responses to a probability table.			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - 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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Chain of Custody (COC) / Analytic Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2351375-COFC

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: leanne.shewchuk@eaststpaul.com

Email 2: operations@eaststpaul.com

Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☑ FAX

Email 1 or Fax: operations@eaststpaul.com

Email 2:

Project Information

ALS Account # / Quote #: Q74289

Job #:

PO / AFE:

LSD:

ALS Lab Work Order # (lab use only): L2351375

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Contact: Connor Cattani Sampler: TM

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200%] (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	FECALS	CONDUCTIVITY	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
1	S U	19-Sep-19	11:15	Water	3	R	R		R	R	R	R	R		R		
2	S L	19-Sep-19	11:05	Water	3	R	R		R	R	R	R	R				
3	P1 U	19-Sep-19	10:19	Water	4	R	R		R	R	R	R	R	R	R		
4	P2 L	19-Sep-19	10:25	Water	3	R	R		R	R	R	R	R				
5	P3 L	19-Sep-19	10:37	Water	3	R	R		R	R	R	R	R				
6	P4 L	19-Sep-19	10:42	Water	3	R	R		R	R	R	R	R				
7	P6 L	19-Sep-19	10:55	Water	4	R	R		R	R	R	R	R	R	R		
8	SS A	19-Sep-19	9:20	Water	4	R	R		R	R	R	R	R	R			
9	SS B	19-Sep-19	9:13	Water	4	R	R		R	R	R	R	R	R	R		
10	SS C	19-Sep-19	9:37	Water	4	R	R		R	R	R	R	R	R			
11	SS D	19-Sep-19	9:47	Water	4	R	R		R	R	R	R	R	R			
12	CS U	19-Sep-19	11:30	Water	4	R	R		R	R	R	R	R	R			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
11.3							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				Sept 19	4:30		Sept 20	2:25

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2351375-COFC

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	RM of East St. Paul
Contact:	Leanne Shewchuk
Phone:	204-668-8112 x 4503
	Company address below will appear on the final report
Street:	3021 Birdshill Road
City/Province:	East St. Paul, MB
Postal Code:	R2E 1A7
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: leanne.shewchuk@eaststpaul.com

Email 2: operations@eaststpaul.com

Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: operations@eaststpaul.com

Email 2:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	Q74289
Job #:	
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L2351375

ALS Contact: Connor Cattani Sampler: TM

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SOLIDS-TOTSUS-WP	TURBIDITY-WP	O2-DIS-WP	P-T-COL-WP	NH3-COL-WP	CL2-TOTAL-WP (Monochloramine)	ANIONS-N2N3-IC-N-WP	CHL-FLUORO-WP	FECALS	CONDUCTIVITY	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
13	CS L	19-Sep-19	11:38	Water	3	R	R		R	R		R	R		R		
14	BTP 1	19-Sep-19	11:53	Water	3	R	R		R	R		R	R				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
11.3							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				Sept 4/19	4:10		Sept 20	2:25

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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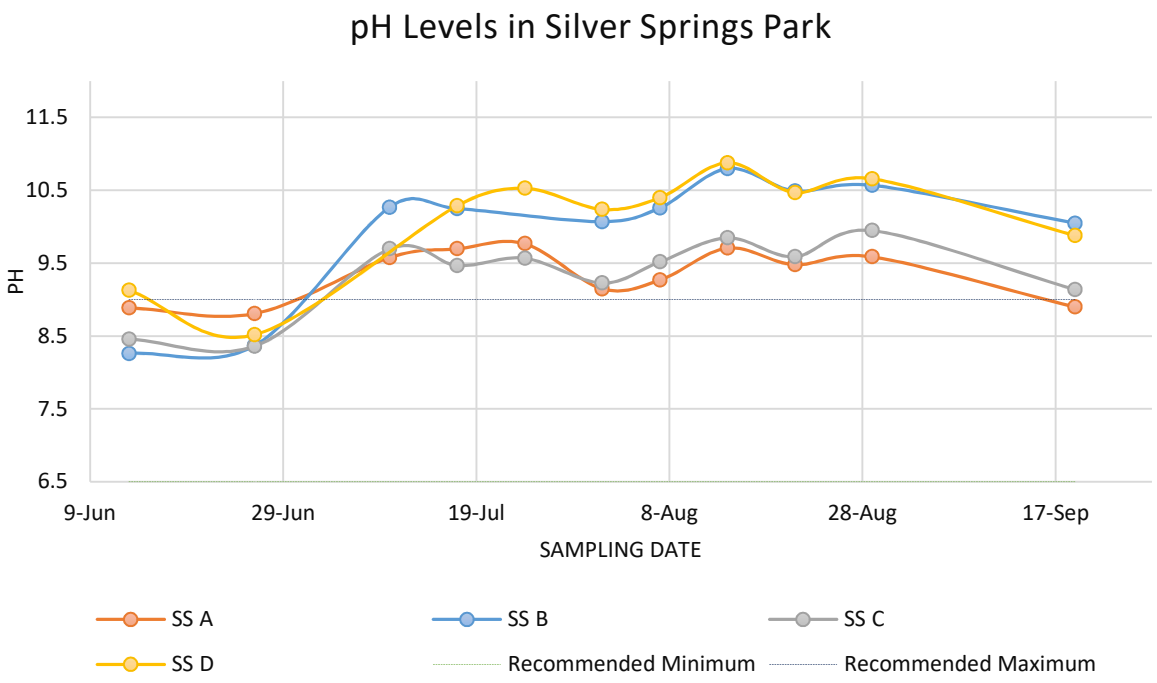
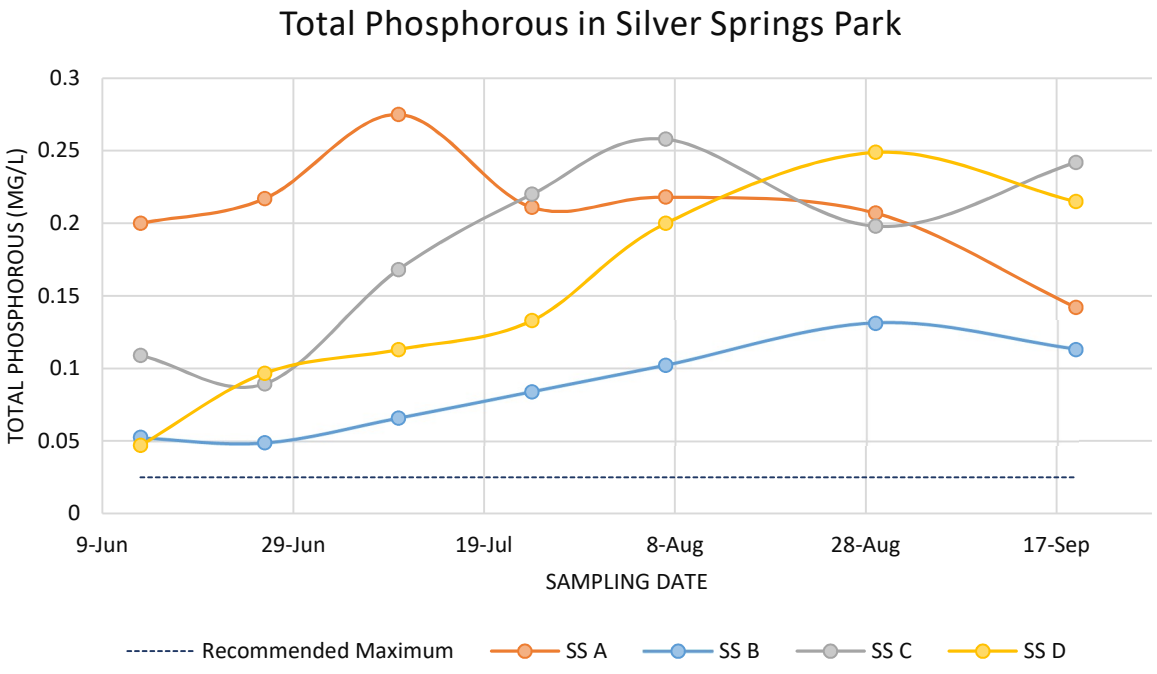
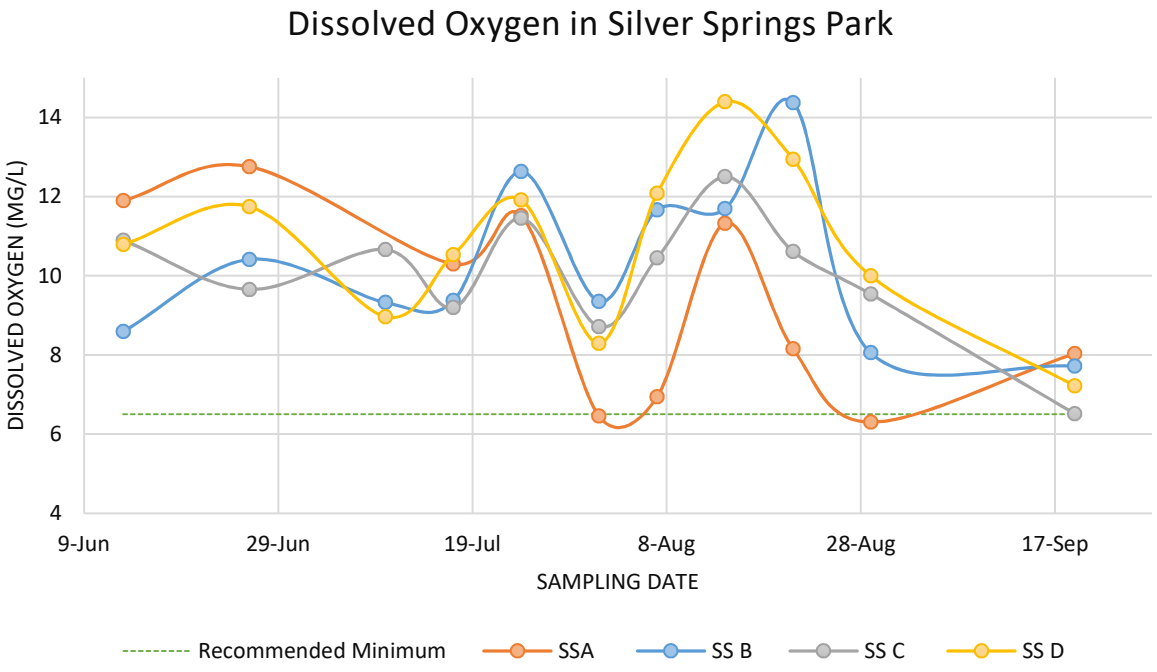
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

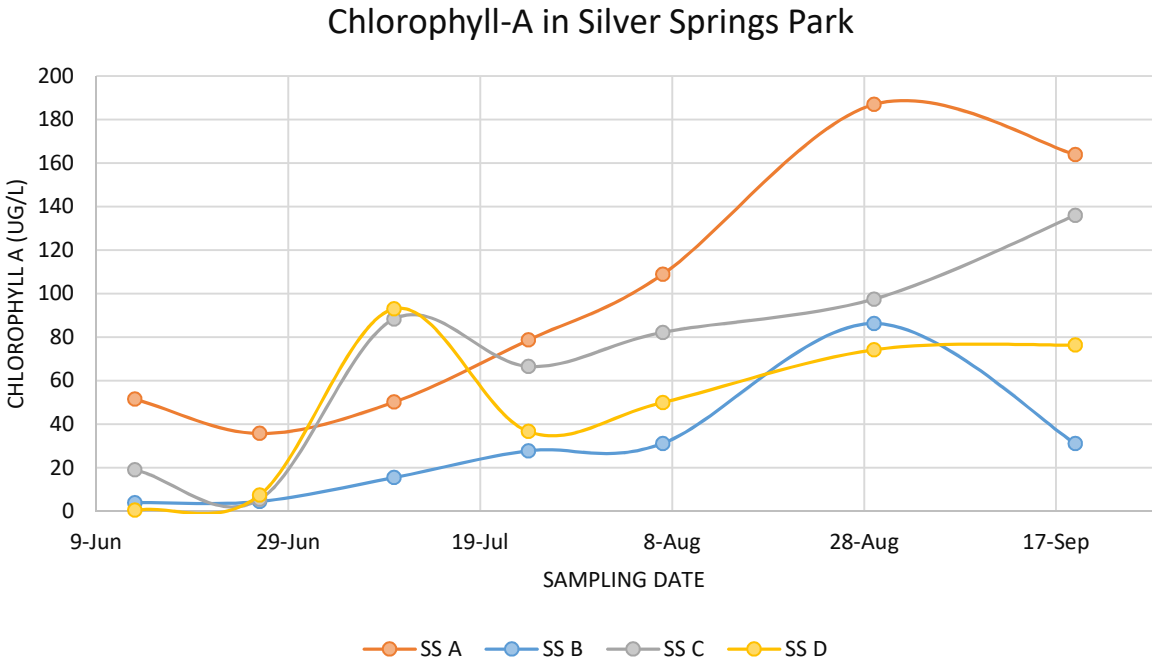
1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

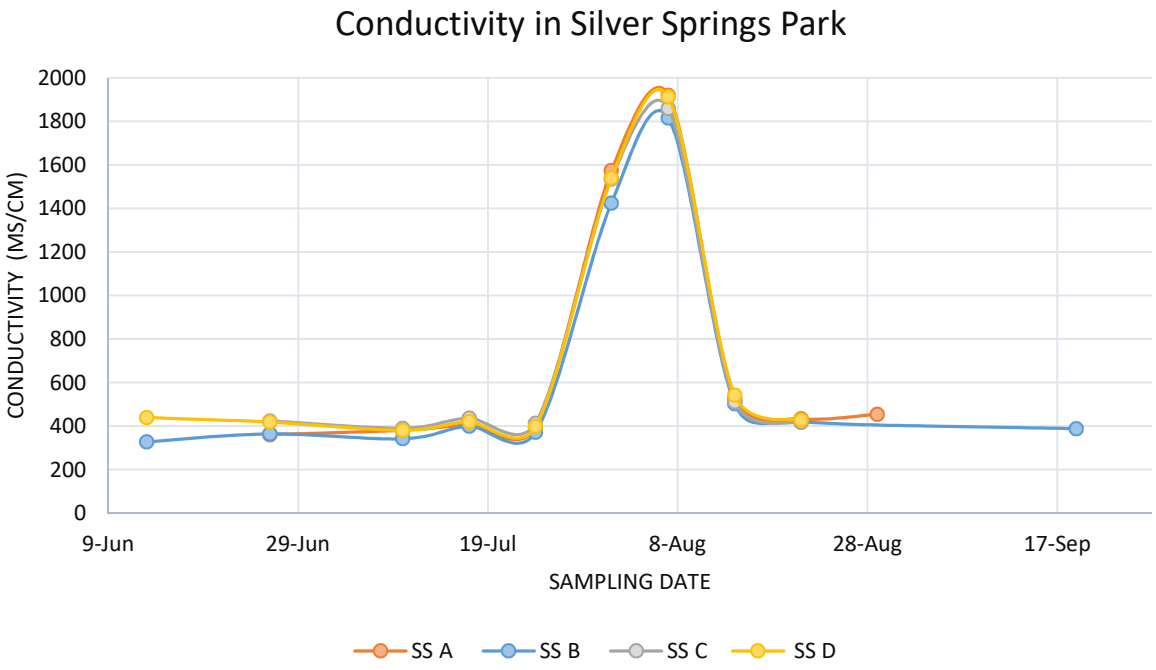
Appendix 3- Graphs of Water Quality Data

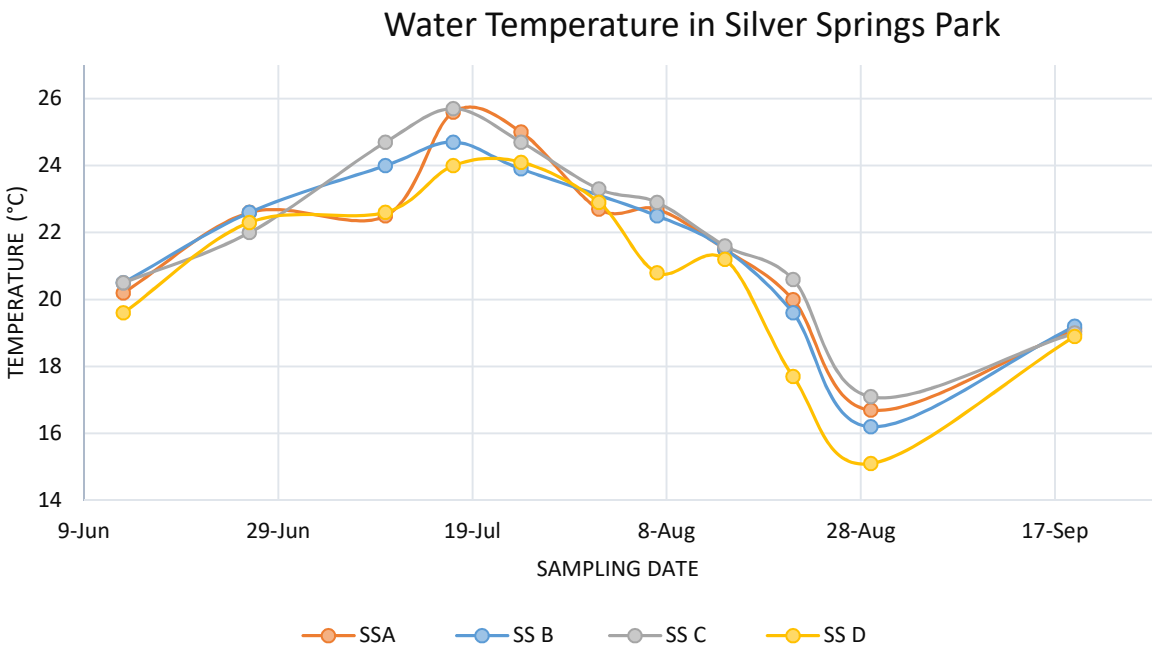





Dissolved Oxygen in Silver Springs Park
DISSOLVED OXYGEN (MG/L)
14
12
10
8
6
4
9-Jun
29-Jun
19-Jul
8-Aug
28-Aug
17-Sep
SAMPLING DATE
Recommended Minimum
SSA
SS B
SS C
SS D


Chlorophyll-A in Silver Springs Park
CHLOROPHYLL A (UG/L)
200
180
160
140
120
100
80
60
40
20
0
9-Jun
29-Jun
19-Jul
8-Aug
28-Aug
17-Sep
SAMPLING DATE
SS A
SS B
SS C
SS D


Conductivity in Silver Springs Park
CONDUCTIVITY (MS/CM)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
9-Jun
29-Jun
19-Jul
8-Aug
28-Aug
17-Sep
SAMPLING DATE
SS A
SS B
SS C
SS D


Water Temperature in Silver Springs Park
TEMPERATURE (°C)
26
24
22
20
18
16
14
9-Jun
29-Jun
19-Jul
8-Aug
28-Aug
17-Sep
SAMPLING DATE
SSA
SS B
SS C
SS D