

2022
Glenmore Landfill Annual Report
Operational Certificate MR 12218
EMS reference # E104956



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1. EXECUTIVE SUMMARY

This 2022 annual report is to provide information relevant to **Operational Certificate MR 12218** for the Glenmore Landfill. Under the provisions of the Waste Management Act and in accordance with the approved *Regional District of Central Okanagan Solid Waste Management Plan (SWMP)*, the City of Kelowna is authorized to manage recyclable materials and to discharge waste to the ground at the Glenmore Landfill, located at 2720 John Hindle Drive, in the City of Kelowna. In 2022, the Glenmore Landfill operated in compliance with the current SWMP.

GHD Canada updated the Design, Operations and Closure Plan (DOCP) to replace the 2008 Comprehensive Site Development Plan. This DOCP update started in late 2017, was completed in Q4 2018, and was submitted to the Province in March of 2019, and Approved by the Director in January 2020. At the time the DOCP was completed in 2018, the City had utilized gap analysis in place of a formal Conformance Review. In 2022 the City of Kelowna retained GHD to finalize a Conformance Review which can be found in *Appendix 1, Glenmore Landfill Conformance Review and Upgrading Plan, GHD, August 9, 2022*. Additional comments on the 2022 progress of the Upgrading Plan can be found in *Appendix 2 – Upgrading Plan Update, City of Kelowna, March 25, 2023*.

An Operational Certificate amendment was published in 2022 and Consultation was performed through February of 2023. This amendment is expected to be completed in March of 2023 and addresses updates to the following items:

- Increase the annual volume of garbage that may be disposed.
- Allow for contaminated soils other than hydrocarbon contaminated soils to be received and used on site.
- Specifically name International Waste received at the Kelowna Airport as an approved waste for disposal.
- Correct some typographical errors.
- Include a reference to the DOCP Approved by the Province in 2020; and
- Update some of the clauses at the request of the Province.

The estimated population contributing to the municipal solid waste handled at the Glenmore Landfill in 2022 was 234,885 based on the BC Government Statistics website (<https://www2.gov.bc.ca/gov/content/data/statistics/people-population-community/population/population-estimates> accessed on March 25, 2023).

This population produced a total of 158,114 tonnes of waste (including hydrocarbon contaminated soil) that was deposited at the Glenmore Landfill in 2022. In addition to this volume of waste disposed, an additional 42,795 tonnes of organics and 23,389 tonnes of recyclables such as concrete, shingles, metal, and other materials were recycled for a diversion rate of 29.51%. Waste volume increases in 2022 are primarily related to an increase in construction/demolition debris due to regional development and an ongoing increase in the Regional Population.

It is expected that a small amount of waste is likely being imported from out of region due to the higher tipping fees in neighbouring regions. Tipping fees were reviewed as part of the overall site development and 10-year Capital Plan and garbage rates increased slightly in 2022. There were no changes to the City Solid Waste Management Bylaw No 10106 in 2022. The Glenmore Landfill also performed a pilot program for pallet recycling and added a Return It Express bottle drop off at the recycling area in 2022. This Express and Go return it location will be operational in early 2023.

2. STATISTICS

The City of Kelowna Glenmore Landfill and Administration Building are located as 2720 John Hindle Drive, Kelowna, BC V1V 2C5. The Scale House has a civic address of 2710 John Hindle Drive.

a. Table 1 - Discharge Quantity (tonnes):

Year	Amount Discharged
2018	166,916
2019	156,566
2020	145,704
2021	154,079
2022	158,114

b. Table 2 - Service Population (all annual numbers updated March 25, 2023)

Year	Population
2018	213,829
2019	218,601
2020	223,626
2021	229,401
2022	234,885

Service population data is obtained annually from the BC Statistics Population Estimates of the Central Okanagan Regional District.

c. Table 3 - Waste Discharge Rate (tonnes/capita updated March 25, 2023):

Year	Waste Discharge Rate (tonnes/capita)
2018	0.781
2019	0.716
2020	0.652
2021	0.672
2022	0.673

d. Authorized design volume:

An updated Fill Plan was prepared for the City of Kelowna by CH2M Hill (now Jacobs Engineering Group) in 2014. This design volume was approximately 40,000,000m³ as of 2014. This design meets Criteria in the 2016 BC Landfill Criteria for Municipal Solid Waste and is the basis for the updated DOCP.

e. Remaining Site Life and Capacity:

Based on the current waste generation volumes and filling plan options, the landfill is expected to be operational until approximately 2107 as updated in Section 8 of the 2018 DOCP.

f. Complaints

The landfill received twenty-one service requests related to landfill operations in 2022. Six complaints were related to customer service issues (i.e., waiting time at the scale house or fees charged) and four complaints were received for nuisance items, specifically noise and odours. The remaining requests were information requests related to waste pick up, or questions regarding recycling and composting. Any additional complaints were received by phone or in person were not tabulated. Typically, issues in the Service Request System were addressed with two business days.

3. **OPERATIONAL PLAN FOR THE NEXT 12 MONTHS (SECTION 8 – CSDP)**

a. Operational and Filling Plan

Filling operations have alternated between AREA 1 and AREA 2 which are located on the western and northern sections of the site, respectively. The Area 1 F lift was completed between the months of May to October. The AREA 2 F lift was started in late December 2021 and completed in May. Filling operations returned to AREA 2 for the G lift in late October. Filling will alternate between AREAS 1 and 2 for the next few years.

While filling progresses in these two locations, earthworks and sub-grade preparation has started for the AREA 3 liner preparation. This included two phases of blasting, selected earthworks, and construction of additional lay down areas and working pads. The AREA 3 liner installation final design is to be completed in 2023 and construction is expected in 2024. The recovery operations currently performed in the AREA 3 footprint will be relocated to new pads being completed at the southern end of the site in 2023. Work in the "Sliver Fill," consisting of filling a thin wedge between AREA 1 and AREA 2 will also start in 2023. The Sliver Fill will bring the existing side slope on the western side of the site up from the historic 5:1 slope to be consistent with the 3:1 slope in the approved DOCP. Additional landfill gas header work and proactive replacement of manholes and wet wells will be incorporated into this Sliver Fill preparation.

An estimated 72,904 tonnes of clean fill were received in 2022 and used as cover. Acceptance of clean fill will be limited in 2023 as the soil stockpile is nearing capacity.

b. Landfilling Method

The area method was used to place and compact waste in cells of approximately 20,000 m³. A 0.3 meter intermediate soil cover was applied on the lift and alternate daily cover was applied on the working face. Wastes were spread in thin layers (0.6 meters or less) and compacted. In 2022 the landfill purchased a new Tana E520 landfill compactor. The original TANA E520 was shipped to the manufacturer for a re-build. A CAT 836H Compactor is used as a backup compactor and will be retired once the re-built TANA returns.

c. Glengrow

The production of Glengrow compost is located at the 10-hectare site constructed to the south of the Phase 3 area of the landfill. Stockpiling and grinding of yard waste feed stock is still performed in the receiving area east of Phase 2. Plans for relocating the organics and recyclable receiving area adjacent to the composting facility to the south of the Phase 3 slough are proceeding.

The city designed and purchased an Aerated Static Pile (ASP) system for the Glengrow composting operations in 2022. Preliminary earthworks, including installation of a 10,000m² asphalt pad was started in 2021, with the ASP scheduled to be constructed in 2023. The ASP system is designed to improve composting efficiency and accommodate future composting volumes growth. The final design of the entire ASP work area was completed in 2022 and Requests for Proposals to construct the first ASP system has been issued to market. Construction is expected to be completed in late 2023.

d. Controls

- *Litter* is controlled by compaction of the waste and minimizing the working face. Fencing for litter control is placed around the fill area as required. In the Spring of 2022, a contractor was also retained to do a one-week litter pick on the landfill and roadways immediately adjacent to the site. Additional temporary fencing was purchased in 2022 and installed to mitigate windblown litter.
- *Dust control* will continue by applying water to access roads, paving additional major roads, and seeding of exposed soil areas. Two areas within the landfill were top dressed in compost and hydroseeded in 2022.
- *Vector control* will continue by using a combination of distress calls, harassment, and daily cover. A falconer continues to assist in reducing the impact of nuisance birds, and a project for Starling control was initiated with the BC Fruit growers Association.
- *Mud control* for internal roads will be accomplished through the construction and maintenance of all-weather access roads to the working face. Crushed shale or ground wood chips will be used as a pad at the tipping area. A wheel wash system is in place to minimize mud tracking coming off-site.
- *Weeds* have been mitigated primarily by gas powered weed eaters, mowing, and using an excavator to clear any overgrown areas.
- *Visual aesthetics* have been addressed by the planting of additional trees and shrubs in the berm along John Hindle Drive and on the hillside to the east of the residential drop off transfer station. Further landscaping along the western side of the landfill along Glenmore Road will be incorporated into other site projects in future years.

e. Heavy Equipment Utilized for Landfill Operations

- TANA E520 Landfill Compactor
- Caterpillar 836H Landfill Compactor
- Volvo D7E Electric Hybrid Dozer
- Case 921 FXR Front End Loader
- Two Volvo L110H Front End Loader
- Komatsu PC220 Excavator
- Two International 7500 Roll-off bin trucks
- Komatsu WA 380 Front End Loader
- Additional Rental equipment as required

f. Landfill Personnel

- 8 Equipment Operators
- 8 Landfill Attendants/Spotter
- 3 Landfill Technicians
- Two full time and 5-part time Scale Operators
- 2 Supervisors
- 1 Manager
- 1 Operations Clerk
- 1 Design Technician

Additional City of Kelowna staff and equipment were brought onsite from other departments to support the landfill operations as needed.

g. Scale House Operations

A total of 229,138 vehicles accessed the site through the scale house. This is a significant decrease from 2021 and is likely due to the decrease in clean fill accepted at the site. In preparation for anticipated future Provincial requirements to scale composting feedstocks, the landfill started weighing and recording weights of clean wood shipped off site.

4. DATA AND INFORMATION

a. Waste Reduction Accomplishments

Table 4 - Material Diverted from Landfill Disposal On-site (tonnes)

Year	Material Diverted
2018	73,542
2019	79,880
2020	70,767
2021	71,330 *
2022	66,184

*Number revised from 2021 report due to calculation error in organics received

Most of the material diverted (42,795 tonnes) was organics such as yard waste, prunings and clean wood waste (pallets and other dimensional lumber). These organic green wastes are composted on-site and sold as soil amendment marketed under the name of GlenGrow. Clean dimensional lumber and branches were ground and supplied to Tolko Industries in exchange for hog fuel that was utilized in the production of OgoGrow, a biosolids based compost produced at another City of Kelowna facility. The ground white wood and branches were also used in the production of OgoGrow.

Select painted lumber is chipped and beneficially re-used on-site as padding material for mud and dust control and is not included in the volume recovered.

A total of 6593.49 tonnes of drywall was received at the Glenmore Landfill in 2022, with 3521.27 tonnes shipped off-site for recycling.

b. Leachate Management

The leachate collection system at the Glenmore Landfill consists of force mains and gravity drains that feed two leachate lift stations. Leachate is then combined with sewage from the City's residential sewer system prior to discharge off-site. Leachate and the combined leachate/sewage effluent are treated with BIOXIDE®, a Calcium Ammonium Nitrate salt solution, and aerated to reduce hydrogen sulfide generation. The treated effluent is discharged into the municipal sanitary sewer system on Glenmore Road and is processed at the City's Wastewater Treatment Facility. Due to site conditions, additional bioxide treatment has been initiated in the wet well at Lift Station 2, which has resulted in a precipitate build up that is being cleaned periodically.

In 2022 an external contractor was hired to clean the three major leachate collection pipes. This marked the first time these pipes had been cleaned. An additional clean out port was constructed and installed in the on-site force main to allow for better access to clean and maintain this system.

Leachate discharge volumes are reflective of the amount of leachate generated via precipitation and increased slightly in 2022, due partially to increased cleaning of the leachate lines and not recirculating leachate in 2022. It should be noted that leachate discharged from the site does not equal leachate generated as pumping rates are dependent on surface water levels, and potential leachate is recirculated in the landfill. Discharge volumes are summarized in the table below.

Table 5 – Leachate Discharge to Wastewater Treatment Facility (WWTF) in m³

Year	Quantity Discharged
2018	152,984
2019	126,300
2020	160,310
2021	118,740
2022	135,492

c. Leachate Recirculation

The purpose of leachate recirculation is to collect the water from beneath the landfill which is pumped back into covered waste cells through landfill gas collection trenches in Phase 1. The concept is that the recirculated leachate will increase the in-situ moisture content of the waste. This would further encourage anaerobic decomposition in the buried waste cells, generating increased amounts of methane (and other landfill gases) which would result in increased throughput of landfill gas to the FORTIS BC Biogas Plant.

A potential added benefit of the accelerated decomposition of in-situ waste is that the decomposing material will increase settlement volume in the landfill resulting in increased air space for continued landfilling activities.

Landfill personnel performed no leachate recirculation in 2022. A new pump was purchased for this project and will be installed as part of a wet well retrofit and replacement in 2023.

d. Landfill Gas Review

The 2022 highlights related to the landfill gas management system included the installation of six new horizontal collector runs consisting of 924 m of new pipe with four previously installed runs being connected to the header system.

Table 6 – 2022 Landfill Gas Volume Summary

Flare Flow volume	1,131,908 m ³
FORTIS BC Biogas Plant Flow volume	2,006,112 m ³
Total LFG Destroyed by Flare/Biogas	3,138,020 m ³
Methane captured based on 50% methane by volume	1,569,010 m ³
Calculated methane captured (tonnes)	1,236
Collection Efficiency (%)	63%

The FORTIS BC biogas plant was the primary method of managing recovered landfill gas for 2022 with 64% of total landfill gas captured being beneficially re-used as renewable natural gas.

The Landfill Gas Management System had fourteen callouts and a total downtime of 41.66 hours for both scheduled and non-scheduled events. This downtime is approximately 0.47% of total operations time compared to 149.6 hours (1.71%) downtime in 2021. A summary of downtime hours collected from the SCADA system and field notes is included in Tables 7a and 7b below. Scheduled flare maintenance was performed while the FORTIS BC Biogas Plant was operational to minimize downtime as much as possible. The site had no system shutdowns due to incidents involving pipe damage from heavy equipment work while installing new connections.

After hour callouts for unscheduled outages were typically less than two hours. Scheduled maintenance included items such as exercising all valves, filling P-Traps, new gas run connections to the system and flare maintenance which were completed when FORTIS BC was not operational.

Table 7a – 2022 Landfill gas system unscheduled outage summary

Date	Outage Time	Total Downtime	Reason
January 11	17:57 – 18:36	39 mins	Flare general/Biogas plant fault
January 12	12:36-13:08, 13:17-13:31	46 mins	Biogas plant vacuum fault/Flare failure fault
February 9	9:49-10:10	21 mins	Flare general, Variable Frequency Drive (VFD) Fault
February 10	15:54-16:08	14 mins	Flare general, VFD Fault
February 13	23:07-23:46, 6:04-34:27, 1:28:04-8:33:04, 9:09-9:49, 9:52- 9:53, 9:58-10:09, 10:17-10:29	563 mins	Flare general fault, Multiple VFD Faults. Likely due to surging caused by water in the manifold.
February 14	14:31-14:51, 18:52-19:49, 23:50-5:44, 9:44- 10:24	503 mins	Flare general fault. Programmable Logic Controller (PLC) programming issues
March 11	4:07-5:03	54 mins	Flare general fault
June 10	10:38 – 16:19	461 mins	Automated safety shutdown
October 2	10:22 – 13:56	152 mins	Biogas Plant Shut down – Flare Failure Alarm. Pressure transmitter issue
November 10	14:20 to 20:22	362 mins	Biogas Plant fault, frozen metering equipment
December 1	18:09 to 19:22	73 mins	Biogas Plant fault, due to extreme cold conditions
December 12	3:43 to 4:54	71 mins	Flare Failure due to instrumentation issue
December 13	10:57 to 11:18	21 mins	Flare Failure due to Blower/VFD Fault
December 22	12:15 to 13:45	90 mins	Extreme cold event
TOTAL		2470 mins (41.66 hours)	

Table 7b -2022 Landfill Gas Management System Downtime

Total Annual hours	8760
Total run time hours – FORTIS BC or Flare	8650
Hours of downtime	110
% Time operational	98.74%

The details of the flare efficiency and overall collection efficiency for the LFG system can be found in the Landfill Gas Collection Efficiency Technical Memo completed by Jacobs of Calgary, AB. This Technical Memo is based on the model and requirements of the BC Landfill Gas Facilities Design Guidelines, 2010, and is attached to this Annual Report as Appendix 3 – 2022 *Landfill Gas Collection Efficiency Study – Glenmore Landfill Site, JACOBS, March 24, 2023*. Landfill Gas Collection Efficiency was calculated to be 63% for 2022. The city continues to make progress to achieve the Provincial performance target of 75% with the help of further SCADA system refinements and enhancements to our monitoring program.

Landfill gas was monitored and adjusted at the wellheads at least once per month in compliance with the requirements of the Landfill Gas Management Regulation. As per of the Environmental Management Plan, the City installed eleven new perimeter soil vapour monitoring wells in 2022. An updated version of this report reflecting the actual locations and installation details can be found in *Appendix 4 – Landfill Gas Migration Assessment for the Glenmore Landfill, GHD, March 6, 2023*. These soil vapour wells will be incorporated into the DOCP's Environmental Management Plan and monitored quarterly in future years. Landfill gas was monitored at least quarterly in five existing perimeter vapour wells.

Gas quality at the flare and upstream of the FORTIS BC Biogas Plant was monitored on a continual basis with alarming and emergency system shutdowns in place.

Surface emissions monitoring was performed on an on-going basis with a Landtec SEM5000 Portable Methane Detector.

e. Groundwater

Groundwater sampling events took place in the Spring (May/June) and the Fall (September/October) as per the recommendations of the 2021 *Glenmore Landfill Annual Water Quality Report (SNC Lavalin 2021)*. Groundwater wells, surface water and leachate were sampled for the parameters of concern by Landfill Environmental Technicians. Samples were submitted to Caro Analytical Services of Kelowna, BC for analysis, and the data reporting and corresponding interpretation was completed by Keltech Environmental Ltd. (Keltech) of Kelowna, BC. The Keltech findings for the water monitoring program are attached to this report in *Appendix 5 – 2022 Glenmore Landfill Annual Water Quality Report, Keltech Environmental Ltd., March 24, 2022*. As noted in the Keltech report, no significant changes to water quality were noted in the results from the 2022 water monitoring program. Certain leachate indicator parameters continue to be elevated at some wells in locations adjacent to or south of the Phase 3 Slough. These are generally consistent to the historical concentrations. The 2022 water levels were generally consistent with previous years.

One groundwater monitoring well was decommissioned in December 2022 by Keltech as per the *Groundwater Protection Regulation* in preparation for future site development. Keltech also performed repairs on three other monitoring wells in 2022. As noted in the Keltech report, impacted sample results were not used for analysis.

f. Surface Water

As part of the surface water management process, Tutt Pond was used as an irrigation source during the agricultural season. Sprinkling occurred intermittently in May through October. This irrigation process has been used at the site for decades to manage surface water. Based upon recommendations from Golder Associates in previous years, water levels were not pumped below a specified elevation in Tutt Pond to eliminate the risk of leachate from being drawn into the pond.

To support the use of surface water for irrigation, a *Human Health and Environmental Risk Assessment – Evaluating Water Use From Tutt Pond and Bredin Pond, Glenmore Landfill, Sept 24, 2018, SNC-Lavalin (HHERA)* was completed and historically submitted to the Province. The HHERA concluded that there were no unacceptable risks to human health. Potential low to medium ecological risk was identified related to increasing pH and sodium concentrations over time for irrigating. Quarterly water sampling for pH and sodium and annual soil pH and sodium adsorption ratio testing were recommended. This testing was completed as part of the 2022 environmental monitoring program and will continue in 2023.

Surface water samples were collected from the four on-site surface water bodies in March, June, September, and October. Additional samples were also collected from Bubna Slough and Slough #2, located north of the landfill, as well as Little Robert Lake and Robert Lake, located south of the landfill, in the same months to aid with assessing background water quality in the region. As noted in the Keltech 2022 water report, surface water quality in 2022 was generally consistent with previous years programs.

g. Leachate Sampling

Leachate samples were collected at four locations on the Landfill site quarterly. Bioxide addition at the south wet well collection point started in spring 2021 and continued in 2022. Samples representative of Area 1, Area 2, and Phase 1 were taken upstream of Bioxide addition. Combined leachate samples and samples from the south leachate wet well were representative of leachate with added Bioxide.

h. Hydrogeological Review

The landfill periodically conducts a fully comprehensive hydrogeological report. The next scheduled review is in conjunction with the 2023 DOCP update.

i. Vegetation Analysis

Observations of vegetation at the landfill perimeter were conducted monthly. There were no visible indications of adverse effects on plants due to leachate or landfill gas migrating to the root zones outside the landfill limit of waste. The landscaped berms along Glenmore Road lost many trees due to a failure in the irrigation system. This section of landscaping will be replaced when internal road

alignment work and surface water management infrastructure is addressed in the next two to four years.

In 2022 a landscape contractor was retained to complete a clearing of the 15m vegetative buffer surrounding the landfill to ensure there was an appropriate fire break.

j. Financial Security

The updated Financial Security Plan was completed in the updated DOCP to meet the requirements of the Second Edition of Landfill Criteria For Municipal Solid Waste (June 2016). The Financial Security Plan was calculated based on estimated closure costs plus post-closure Operations and Monitoring of 80 years as determined by the Contaminating Lifespan Analysis. The Financial Closure Fund will be updated with the assistance of the City Financial department based on the PS 3270 Accounting Principles. This fund is currently calculated to be just over \$81M.

Tipping fee rates for garbage increased in January 2023 from \$102/tonne to \$104/tonne. The city performs ongoing financial analysis to ensure funding for projects based on the 2018 DOCP and the City's 10-year Capital Plan. The city will be reviewing the rates for additional selected wastes as well as garbage in early 2023.

As in previous years, excess revenues were deposited into a reserve fund that will be used to develop the site for infrastructure and capital costs for items such as leachate, landfill gas, and water management systems, and to cover the cost of landfill closure and post closure.

5. LIST OF APPENDICES

Appendix 1, Glenmore Landfill Conformance Review and Upgrading Plan, GHD, August 9, 2022

Appendix 2 – Upgrading Plan Update, City of Kelowna, March 25, 2023

Appendix 3 - 2022 Landfill Gas Collection Efficiency Study – Glenmore Landfill Site, JACOBS, March 23, 2023

Appendix 4 – Landfill Gas Migration Assessment for the Glenmore Landfill, GHD, March 6, 2023

Appendix 5 – 2022 Glenmore Landfill Annual Water Quality Report, Keltech Environmental Ltd., March 24, 2023

Appendices

Appendix 1

GHD Glenmore Landfill Conformance
Review and upgrading plan 20220809

Our ref: 12562050

09 August 2022

Scott Hoekstra
City of Kelowna
1435 Water Street
Kelowna, BC
V1Y 1J4

BC Landfill Criteria Conformance Review & Upgrading Plan – Glenmore Landfill, Kelowna BC

Dear Mr. Hoekstra,

GHD has prepared this BC Landfill Criteria Conformance Review and Upgrading Plan for the Glenmore Landfill (Landfill, Site) located in the City of Kelowna (CoK). This letter has been prepared to satisfy the requirement of a Conformance Review and Upgrading Plan per Section 2.2 of the Ministry of Environment and Climate Change Strategy (ENV) BC Landfill Criteria for Municipal Solid Waste, 2nd Edition published in 2016 (Landfill Criteria). The Landfill Criteria are intended to serve as guidance on environmentally sound landfilling practices and protocol; however, the Landfill Criteria are not mandatory requirements unless incorporated into the Site authorization (Operational Certificate). GHD's review of the Landfill's conformance is based on available documentation, as well as information provided by CoK.

1. Site Description

Glenmore Landfill is owned by the CoK and is authorized to receive waste from within the Regional District of Central Okanagan (RDCO) and the Big White area under Operational Certificate No. 12218, issued June 29, 2015 (OC), and currently under review for amendment. The Landfill is a multi-purpose waste management facility, providing waste management services for non-hazardous solid waste from municipal, commercial, institutional, and light industrial sources. The Landfill is located approximately 1.5 kilometres (km) east of Okanagan Lake and 9 km northeast of downtown Kelowna, and consists of the following main areas, as shown on Figure 1:

- Phase 1 – active disposal area located in the northern portion of the Landfill.
- Phase 2 – active disposal area located in the central portion of the Landfill.
- Phase 3 – historical and future disposal area located south of Phase 2. Phase 3 currently consists of a slough.
- Compost Facility – located in the south of Phase 3 and currently used for composting operations.
- Northeast Area – area located in the northeast corner of the Landfill that includes the Northeast Pond.
- Scale House/Public Drop-Off Area – Landfill entrance and public drop-off area located at the south end of the Site.

According to the 2021 Glenmore Landfill Annual Report (City of Kelowna, 2022), approximately 154,079 tonnes of waste were received in 2021 as well as 96,176 tonnes of clean fill. Landfilling took place in Areas 1 and 2 of Phase 1, in the northern end of the property.

2. Landfill Criteria Conformance Review

In 2017, CoK retained GHD to prepare an updated Design, Operations and Closure Plan (DOCP) for the Landfill, beginning with a pre-update gap assessment that reviewed the Landfill design and documentation against the Landfill Criteria. The results of the gap assessment were presented to CoK in a letter dated April 12, 2017, which has been provided in Attachment 1. To the extent possible, the items outlined in the letter were addressed or incorporated into the DOCP.

Table 1 presents the Landfill Criteria Conformance Review as of the date of this letter.

Table 1 Landfill Criteria Conformance Review

Section	Criterion	In Conformance?	Note
3	Siting Criteria	EX	Approved Landfill footprint.
4	Performance Criteria		
4.1	Groundwater & Surface Water Quality	OUT	The 2018 DOCP identifies uses of groundwater and surface water within 1 km of the Landfill footprint and recommends appropriate water quality criteria and compliance locations. Groundwater and surface water monitoring results show elevated concentrations of leachate indicator parameters downgradient of the Landfill that exceed the applicable water quality criteria. Per the data in the 2021 Annual Operations and Monitoring Report, the water quality appears relatively consistent on an annual basis. Analytical results from upgradient groundwater wells suggest elevated concentrations of certain parameters in background water quality. A background/Robert Lake water quality study is required to assist in determining background water quality conditions for the Site.
4.2	Landfill Gas (LFG) Management	OUT	The 2018 DOCP presents an LFG Facilities Design Plan and LFG Generation Assessment that conform with the requirements of Section 4.2 of the Criteria. In 2021, City of Kelowna environmental technicians underwent training on Safe Work Procedures and best management practices for protection and signage. To ensure combustible gas concentrations measured in on-site buildings do not exceed 20% of the lower explosive limit of methane (1% by volume) at any time, LFG in soil gas shall be monitored inside Site buildings where risk warrants. An LFG Migration Assessment was completed in 2021 by GHD and a report evaluating monitoring needs for building was completed by SLR in 2017. Recommendations from the LFG Migration Assessment include installation of soil vapour probes.
4.3	Nuisance	IN	The 2018 DOCP presents a Landfill nuisance study and several nuisances (e.g., litter, dust, vector, mud, odour) to prevent public nuisances. Nuisance modeling for dust and odour was completed and monitoring stations were installed as a proactive measure in 2021. The system continues to be refined, as needed.

Section	Criterion	In Conformance?	Note
5	Design Criteria		
5.1	Service Life & Contaminating Lifespan	IN	The Landfill facility design service life (in post-closure) exceeds the contaminating lifespan.
5.2	Site Layout	IN	The 2018 DOCP presents a Site layout that provides for Site entrance, gatehouse, recycling/material recovery areas, access roads, the Landfill footprint, as well as surface water management, leachate management and landfill gas management infrastructure, and conform with the requirement of Section 5.2 of the Criteria.
5.3	Landfill Base Design	OUT	The 2018 DOCP Section 9.2 provides details of the Landfill base for lined landfill expansion areas in accordance with the Criteria of 2% grade for the primary drainage path (leachate collection piping), minimum 0.5% for the secondary drainage path (drainage blanket) and maximum drainage path in the drainage blanket to a leachate collection pipe shall be 50 m. As noted in Section 10 of the DOCP, based on analysis by CH2M HILL (2015) the Landfill is safe for static conditions; however, permanent deformations are anticipated under seismic loading. Geotechnical investigation including borehole and updated slope stability assessment will be recommended to be completed within the next 10 years (from 2018) to collect data in support of refined slope stability and liquefaction analysis.
5.4	Landfill Base Liner	IN	The Landfill base liner meets the requirements outlined in Section 5.4 of the Criteria.
5.5	Leachate Collection System (LCS)	IN	The Landfill LCS above the geomembrane liner was designed to allow for collection of leachates and to eliminate the buildup of a leachate head on the landfill base liner. The LSC design meets the minimum specifications in Section 5.5 of the Criteria.
5.6	Surface Water Management	ND	The SWP presented in the DOCP provides the conceptual design and operational procedures to route storm water runoff from the Landfill in a manner that is practical, effective and ensures that downstream receptors are not adversely impacted. As Site is located within a larger catchment area with currently no natural outlet for surface water runoff, development of wholistic surface water management infrastructure requires coordination with other provincial and municipal entities. Until the final conditions surface water routing is implemented, surface water will continue to be managed such that surface water from outside of the Landfill and from Landfill areas is managed through on-site ponds.
5.7	LFG Management Works	IN	Works are constructed as a part of the LFG Management Regulation and BC LFG Management Facilities Design Guideline, but the 2018 DOCP does not address if LFG management works follow the "Technologies and Best Management Practices for Reducing GHG Emissions from Landfills Guidelines".
5.8	Final Cover Design	IN	Final Cover design meets the requirements specified in Section 5.8 of the Criteria.
5.9	Final Contours	IN	Final Contours meet Criteria and the installation of surface water ditches and mid-slope control benches.

Section	Criterion	In Conformance?	Note
5.10	Site Security & Fencing	EX	The 2018 DOCP presents Site security and fencing measures taken at the Landfill. The Site perimeter is partially fenced. Vehicular access is blocked by chain link gates on the southern boundary of the Site north of John Hindle Drive. Agricultural fencing surrounds the portion of the Site property leased for the cattle farm on the southeast and southwest corners of the Site. The western Site perimeter is fenced with a chain link fence and gates at the former entrance. An agricultural fence just north of the Landfill separates the field located to the north. Additional fencing was installed east of Bredin Hill in 2018. There are no fences east of Tutt Mountain; however, the mountain itself is a physical barrier to Landfill access.
5.11	Access Roads	IN	Landfill access roads meet the requirements of Section 5.11 of the Criteria, as described in the 2018 DOCP and shown on drawings.
5.12	Vectors & Wildlife	IN	The Landfill has been designed to satisfy the operational criteria with respect to vector and wildlife management and nuisance controls.
6	Operational Criteria		
6.1	Authorized Wastes	IN	Section 8.3 of the 2018 DOCP outlines waste acceptance and waste diversion procedures, which are consistent with the OC.
6.2	Landfilling of Wastes	IN	The landfilling operational procedures are consistent with guidelines in Section 6.2 of the Criteria.
6.3	Cover Placement	IN	The cover placement procedures are consistent with guidelines in Section 6.3 of the Criteria.
6.4	Nuisance Controls	IN	The Landfill is designed and operated to comply with the Criteria's nuisance control. Nuisance modeling for dust and odour was completed and monitoring stations were installed as a proactive measure in 2021. The system continues to be refined, as needed.
6.5	Vectors & Wildlife Management	IN	Vector and wildlife management practices are addressed the 2018 DOCP. A bear fence is not applicable.
6.6	Burning	IN	Burning of waste is not addressed in the 2018 DOCP, however no burning is being undertaken at the Landfill.
6.7	Landfill Fire Management	IN	The 2018 DOCP contains a Fire Safety and Emergency Plan which addresses the Landfill Fire Management requirement outlined in Section 6.7 in the Criteria.
6.8	Scavenging	IN	The 2018 DOCP explains that scavenging is prohibited at the Landfill. Site security measures are in place that prevent scavenging.
6.9	Site Health & Safety Plan	IN	The Landfill Site operations meet the requirements of Work Safe BC.
6.10	Signage	IN	Internal and external signage is not specifically addressed in the DOCP.
6.11	Weigh Scales	IN	The weigh scales meet requirements of federal Weights and Measures Act. Two unattended scale terminals on the outer inbound and outbound scales are automated with Radio frequency identification (RFID) access cards and control gates that allow high volume commercial haulers to access the Landfill. The unattended system was rolled out

Section	Criterion	In Conformance?	Note
			in 2015 using a staged approach, and the program was expanded in 2018. These automated scales may be converted to manual operations at any time to help manage high traffic volumes.
6.12	Records	IN	Record keeping requirements are described in Section 12.15 of the 2018 DOCP. The City produces an Annual Operations and Environmental Monitoring Report each accordance with the Criteria for submission to the Ministry.
6.13	Operator Training	IN	Operator training methods not addressed in DOCP; however, the City has a training matrix for each role.
7	Closure & Post-Closure		
7.1	Closure Plan	IN	The 2018 DOCP includes a closure plan and addresses the formulation of an end use plan for Landfill closure to the end of the estimated Site life.
7.2	Progressive Closure	IN	The 2018 DOCP includes a filling plan and specifies that areas of the Landfill that reach final waste contours as shown in Drawing C 05 will be closed once sufficient area to warrant construction of final cover is available.
7.3	Post- Closure O&M	IN	Post closure operations are specified to be conducted in accordance with the Closure Plan.
7.4	Contaminating Lifespan	IN	Section 16 of the 2018 DOCP addresses the contaminating lifespan of the Landfill. The contaminating lifespan was determined according to Section 7.4 of the Criteria.
7.5	Contaminated Sites Regulation	IN	The 2018 DOCP acknowledges that the end use plan must comply with the requirements of the Contaminated Sites Regulation.
8	Financial Security	IN	As a public Landfill owner, the City follows the PSAB financial reporting model for annual financial reporting.
9	Monitoring		
9.0	Monitoring Criteria	IN	The 2018 DOCP presents a detailed Environmental Monitoring Plan (EMP) in accordance with Section 9.0 of the Criteria with recommendations for additional monitoring location. The EMP is updated annually, and the latest program is presented in the 2021 Annual Report. Since 2021, the EMP includes the recommended additional amendments including: background groundwater/surface water locations, surface water locations, hydraulic levels, new monitoring wells, and leachate samples.
9.1	Leachate Monitoring	IN	The EMP in the 2018 DOCP specifies a leachate monitoring program in accordance with Section 9.1 of the Criteria. The results of leachate monitoring are reported in the annual operations and environmental monitoring report.
9.2	Groundwater & Surface Water Quality Monitoring	IN	The EMP in the 2018 DOCP specifies a groundwater and surface water monitoring program in accordance with Section 9.2 of the Criteria. The results of groundwater and surface water monitoring are reported in the annual operations and environmental monitoring report. Recommended additional wells were installed in 2019 and monitoring at these new locations is being undertaken.
9.3	LFG Monitoring	OUT	The 2018 DOCP recommends an LFG mitigation assessment be completed to satisfy Section 9.3 of the Criteria. The City retained Qualified Persons (QP) to complete a LFG mitigation assessment for on-site building

Section	Criterion	In Conformance?	Note
			and for off-site migration. Installation of additional probes was recommended. Changes to the environmental monitoring program implemented and data being collected to establish a baseline.
10	Plans & Reports		
10.1	HHCR	OUT	A number of studies and reports have been completed for the Site, however based on a review of water quality data, the Site's background water quality was not sufficiently characterized. Installation of additional monitoring wells A comprehensive Hydrology and Hydrogeology Characterization Report (HHCR) satisfying Section 10.1 of the Criteria has not been completed to date. An HHCR is recommended to incorporate additional water quality data from the new wells installed.
10.2	Construction Reports	IN	Construction reports are submitted annually as an attachment to the Annual Operations and Monitoring Report.
10.3	DOCP	IN	The 2018 DOCP was prepared according to Section 10.3 of the Criteria. The next update of the DOCP is scheduled for 2023.
10.4	LFG Generation Assessment	IN	An LFG Generation Assessment was completed for the Landfill. The City reports landfill gas generation per the requirements of the Landfill Gas Management Regulation.
10.5	LFG Management Facility Design Plan	IN	An LFG Management Facility Design Plan has been completed for the Landfill.
10.6	Annual Operations and Monitoring Report	IN	The City prepares annual operations and environmental monitoring reports. The 2021 Annual Report was reviewed and satisfies Section 10.6 of the Criteria.

3. Upgrading Plan

Following the receipt of a ENV inspection letter on July23, 2019, CoK and GHD compiled a list of action items that form the basis of the Upgrading Plan. The list of action items has been tracked, with status updates provided in June 2020, Q1 2021 and Q1 2022, as shown in Attachment 2. As of the date of this letter, the Upgrading Plan is described in Table 2 below.

Table 2 Upgrading Plan

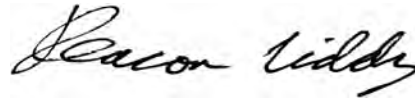
Section	Criterion	Upgrading Plan Action	Schedule
4	Performance Criteria		
4.1	Groundwater & Surface Water Quality	The 2018 DOCP identifies uses of groundwater and surface water within 1 km of the Landfill footprint and recommends appropriate water quality criteria and compliance locations. Groundwater and surface water monitoring results show elevated concentrations of leachate indicator parameters downgradient of the Landfill that exceed the applicable water quality criteria. Per the data in the 2021 Annual Operations and Monitoring Report, the water quality appears relatively consistent on an annual basis. Analytical results from upgradient	In progress, data being acquired by ongoing sampling events. HHCR and background water quality assessment are planned to be completed by December 2023.

Section	Criterion	Upgrading Plan Action	Schedule
		groundwater wells suggest elevated concentrations of certain parameters in background water quality. A background water quality/Robert Lake water quality study is required to assist in determining background water quality conditions for the Site.	
4.2	Landfill Gas (LFG) Management	LFG monitoring soil probes will be installed according to the recommendations outlined in the LFG Migration Assessment completed in 2021.	By the end of 2022.
5.3	Landfill Base Design	The 2018 DOCP Section 9.2 provides details of the Landfill base for lined Landfill expansion areas in accordance with the Criteria of 2% grade for the primary drainage path (leachate collection piping), minimum 0.5% for the secondary drainage path (drainage blanket) and maximum drainage path in the drainage blanket to a leachate collection pipe shall be 50 m. As noted in Section 10 of the DOCP, based on analysis by CH2M HILL (2015), the Landfill is safe for static conditions; however, permanent deformations are anticipated under seismic loading. Geotechnical investigation including borehole and updated slope stability assessment will be recommended to be completed within the next 10 years (from 2018) to collect data in support of refined slope stability and liquefaction analysis.	Scheduled as future work (2023 - 2025)
5.6	Surface Water Management	The Surface Water Management Plan (SWP) presented in the DOCP provides the conceptual design and operational procedures to route storm water runoff from the Landfill in a manner that is practical, effective and ensures that downstream receptors are not adversely impacted. As the Site is located within a larger catchment area with currently no natural outlet for surface water runoff, development of wholistic surface water management infrastructure requires coordination with other provincial and municipal entities. Until the final conditions surface water routing is implemented, surface water will continue to be managed such that surface water from outside of the Landfill and from Landfill areas is managed through on-site ponds.	The initial conceptual surface water modeling and diversion designs are completed, and meters installed to evaluate potential maximum flow rates and for sizing ponds. Additional design work to be completed as part of the downstream permitting and design. The stormwater works are currently in detailed design. Berm re-configuration to be included as part of the works and will be re-vegetated when completed (estimated 2026).
7	Closure & Post-Closure		
9.3	LFG Monitoring	2018 DOCP recommends an LFG mitigation assessment be completed to satisfy Section 9.3 of the Criteria. The City retained QPs to complete an LFG mitigation assessment for on-site building and for off-site migration. Installation of additional probes was recommended.	By the end of 2022.
10	Plans & Reports		
10.1	HHCR	A Hydrogeological Assessment was completed by Golder (2012) with a supplemental assessment of bedrock faults in 2014. An updated HHCR is recommended to incorporate additional water quality data from the new wells installed.	To be completed with next submission of DOCP (2023)

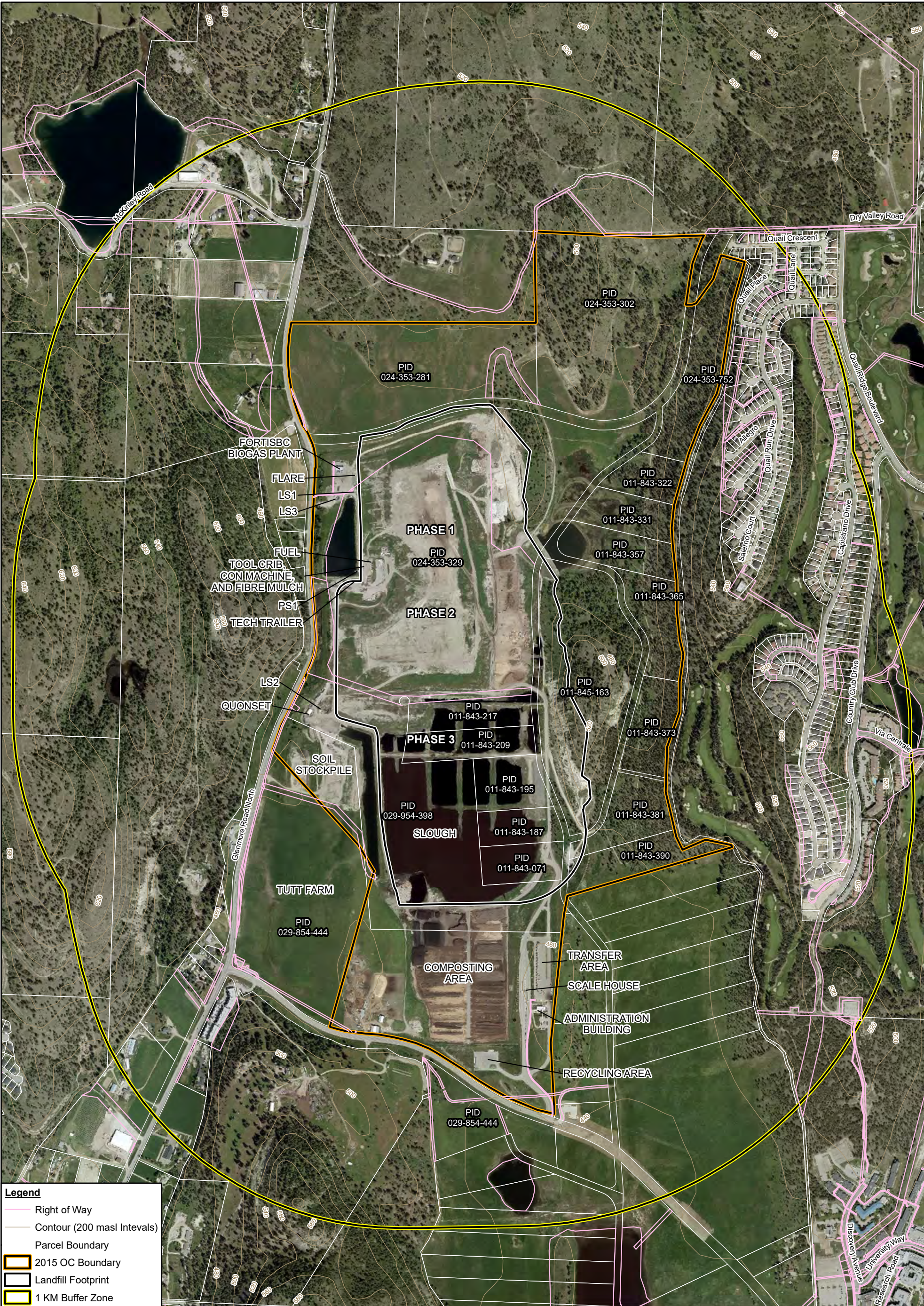
Regards



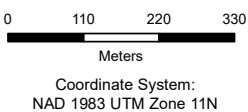
Roxy Hasior, P.Eng.
Engineer – Solid Waste
+1 604 248-3932
Roxanne.hasior@ghd.com



Deacon Liddy, P.Eng. MBA
Business Group Leader – Solid Waste
+1 604 214-0510
Deacon.liddy@ghd.com



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Aerial: City of Kelowna Orthophotos, May 21, 2017



2018 DESIGN, OPERATIONS AND CLOSURE PLAN
GLENMORE LANDFILL
CITY OF KELOWNA

SITE PLAN

084612-22
Jul 11, 2018

FIGURE 4.1

Attachments

Attachment 1

**April 2017 GHD Letter: Gap
Assessment**



Memorandum

April 12, 2017

To:	Kevin Wahl – City of Kelowna	Ref. No.:	084612-01
From:	Deacon Liddy/Thomas Elliott/cs/01	Tel:	604-214-0510
CC:	Andrew Reeder, Scott Hoekstra		
Subject:	Pre Landfill Master Plan Update Gap Assessment Glenmore Landfill, Kelowna, British Columbia		

1. Introduction

The City of Kelowna (City) retained GHD Limited (GHD) to complete a review of existing documentation for the Glenmore Landfill (Site), located in Kelowna British Columbia (BC), to identify required tasks and potential gaps in landfill studies, designs, and/or modelling necessary to develop a Landfill Master Plan.

The City requested that GHD compare the existing landfill design documents and concept to requirements for Design, Operations and Closure Plans (DOCP) contained in the BC Ministry of Environment (MOE) Landfill Criteria for Municipal Solid Waste, Second Edition, dated June 2016 (Landfill Criteria) and use GHD's experience of landfill design and operations to identify required tasks. The Landfill Master Plan will include the information required by the Landfill Criteria for a DOCP. As the deliverable the City is seeking is a Landfill Master Plan, hereinafter the term Landfill Master Plan will be used rather than DOCP.

1.1 Reference Documents

To complete the pre landfill master plan update gap assessment, the City provided a number of documents for review. The following list presents documents which are referenced in the memo:

- Operational Certificate 12218. British Columbia Ministry of Environment (2000, December 8)
- Status of American Avocet in British Columbia. British Columbia Ministry of Environment, Lands and Parks, Wildlife Branch (2000)
- 1999 American Avocet Research Project in British Columbia. Central Okanagan Naturalist Club (1999)
- Final Draft Surface Water Management Plan Glenmore Landfill. CH2MHILL (2006)
- Comprehensive Site Development Plan Glenmore Landfill. CH2MHILL (2008)
- Landfill Gas Generation Assessment Report (Final) Glenmore Landfill Site. CH2MHILL (2010)
- Landfill Gas Management Facilities Design Plan (Final) Glenmore Landfill Site. CH2MHILL (2012)
- Ultimate Long Term Filling Plan and Development Considerations for the Glenmore Landfill. CH2MHill (2014)
- Glenmore Landfill - Technical Review. CH2MHILL (2014a)



- Ultimate Long Term Filling Plan and Development Considerations for the Glenmore Landfill. CH2MHill (2014b)
- Ultimate Long Term Filling Plan Financial Model Update for the Glenmore Landfill. CH2MHill (2014c)
- Glenmore Landfill Geotechnical Investigation and Analyses Report. CH2MHILL (2015)
- Landfill Gas Collection Efficiency Study, Glenmore Landfill Site. CH2MHILL (2015)
- 2014 Glenmore Landfill Annual Report. City of Kelowna (2015)
- 10-Year Capital Plan. Kelowna, British Columbia. City of Kelowna (2016)
- 2015 Glenmore Landfill Annual Report. City of Kelowna (2016)
- 2015 Glenmore Landfill Annual Report. City of Kelowna (2016)
- 2016 Glenmore Landfill Annual Report. City of Kelowna (2017)
- Landfill Gas Management Facilities Design Guidelines. Conestoga-Rovers & Associates (2010)
- Geotechnical Investigation Proposed Leachate Collection System Glenmore Road Landfill Kelowna, B.C. EBA Engineering Consultants Ltd. (1998)
- Phase I Environmental Assessment City of Kelowna Glenmore Landfill. Gartner Lee (1990)
- Glenmore Landfill Hydrogeological Investigations. Gartner Lee (1992)
- Glenmore Landfill - South Ground Water Monitor Installation. Gartner Lee (2000)
- Geotechnical Investigation Pond Relocation Sanitary Landfill Site. Golder Associates Ltd. (1992)
- Geotechnical Investigation Phase I Proposed Borrow/Future Landfill Site Glenmore Road. Golder Associates Ltd. (1989)
- Hydrogeological Assessment of Bedrock Faults in Terms of their Potential to Support Off-Site Groundwater and Leachate Migration - Glenmore Landfill Kelowna, BC. Kelowna, British Columbia, Canada. Golder Associates Ltd. (2014, May 23)
- Glenmore Landfill, Kelowna, BC 2014 Annual Water Quality Monitoring Report. Golder Associates Ltd. (2015)
- 2015 Annual Water Quality Monitoring Report. Golder Associates Ltd. (2016)
- Surface Water and Groundwater Management Strategy, City of Kelowna Glenmore Landfill. Golder Associates Ltd. (2016)
- Water Well Survey and Bedrock Geology Review in the Vicinity of the Glenmore Landfill - 2105 Glenmore Road, Kelowna, BC. Golder Associates Ltd., SLR (November 2015)
- Regional District of Central Okanagan Solid Waste Management Plan. Regional District of Central Okanagan (1992)
- City of Kelowna Glenmore Landfill Operations Plan. UMA Engineering Engineers & Planners (1990)



- City of Kelowna Glenmore Landfill North Area Development and South Area Closure. UMA Engineering Ltd., Gartner Lee Limited (1996)

The above noted documents, hereinafter referred to as reference documents, were reviewed by GHD as they pertain to each section of the Landfill Master Plan and applicable documents are referenced for each in Section 3.

1.2 Landfill Criteria Required Sections

Section 10.3 of the Landfill Criteria requires that a DOCP include the following sections:

1. Topography	12. Surface Water Management Plan
2. Physical Summary	13. Leachate Management Plan
3. Geotechnical and Seismic Assessment	14. LFG Management Plan
4. Groundwater and Surface Water Impact Assessment	15. Environmental Monitoring Plan
5. Site Plan	16. Facility Operations Plan
6. Site Layout Plan	17. Closure Plan
7. Landfill Design	18. Fire Safety Plan
8. Filling Plan	19. Emergency Response Plan
9. Progressive Closure Plan	20. Financial Security Plan
10. Lifespan Analysis	21. Contingency Plan
11. Contaminating Lifespan	22. Land Survey

1.3 Memorandum Organization

This memorandum is organized as follows:

Section 2 – Gap Analysis Summary

Presents a summary of tasks identified based on Landfill Criteria and/or additional requirements which require additional information or significant analysis not present in reference documents to complete.



Section 3 – Landfill Master Plan Update Scope

Section 3 is generally organized to present the requirements associated with each section of the Landfill Criteria discussed in Section 1.2 and provide the following assessments for each:

- 1) Landfill Criteria Requirements – identification of requirements of the Landfill Criteria are outlined.
- 2) Additional Requirements – identification of requirements in addition to the Landfill Criteria requested by the City and/or identified as best practices by GHD.
- 3) Data Gaps – identification of tasks which require additional information or significant analysis not present in reference documents for completion.
- 4) Deliverables –deliverable(s) required to meet Landfill Criteria and/or additional requirements are outlined.

Section 4 – References

2. Gap Analysis Summary

Based on GHD's review of the reference documents, GHD has identified a number of required Landfill Master Plan components which cannot be developed based entirely on existing reports/data.

1. Geotechnical investigation of Tutt and Bredin Mountains – Will require the completion of geotechnical investigations to determine suitability of Tutt and Bredin Mountains as potential sources for borrow materials. The assessments should determine the suitability of borrow material for use on the Landfill and, if the identified materials are suitable for use as on Site, the stability of Tutt and Bredin Mountains during extraction of borrow materials.
2. Filling and Progressive Closure Plan – Will require the development of a more detailed fill plan that includes design of infrastructure to be constructed in each Stage. The filling and progressive closure plan should include leachate collection piping, landfill gas collection trenches and piping, roads, material borrow area, material storage areas, surface water ditching and ponds, and final cover. The filling and progressive closure plan will be used to support the development of cost forecasts for operation, closure and post closure periods for use in financial reporting and capital planning.
3. Surface water management plan – Will require hydrological modeling based on site development plans and design of site surface water management infrastructure to manage the 24-hour, 100-year design storm during site operations, closure and post-closure conditions as well as maintenance and monitoring associated with surface water management infrastructure.
4. Leachate management plan (LMP) – Will require the development of leachate volume and quality forecasts for each stage of Site development and a review of the acceptance criteria (capacity and quality) for long-term leachate management in the City sewer.
5. Fire safety and emergency response plan – Will require the development of additional plans and incorporation of existing documents.



6. Contingency plan – Will require identification of possible failure and non-compliance scenarios of the leachate, surface water, and landfill gas (LFG) management facilities based on current conditions as identified in the Landfill Master Plan and identification of practical and implementable contingency measures to address any potential failure or non-compliance.
7. Materials management plan: Will require the development of a materials management plan that describes and forecasts waste receipt, processing and diversion activities on-Site based on current and planned Site development as identified in the Landfill Master Plan.
8. Cost Forecast and Landfill liability estimate– Will require the development of a Landfill liability estimate to meet Canadian Public Sector Accounting Standard PS 3270 – Solid Waste Landfill Closure & Post Closure Liability based costs associated with closure, post closure maintenance and environmental monitoring as identified in the Landfill Master Plan.

3. Landfill Master Plan Update Scope

The following section presents Landfill Criteria requirements, additional requirements, data gaps and deliverables for each required Landfill Master Plan required component as outlined in Section 10.3 of the Landfill Criteria.

3.1 Site Figures (Topographical Map, Site Plan, Site Layout Plan)

3.1.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain the following information shown on Site figures:

- Topography – a map of the Landfill site and the surrounding region within 1 kilometre (km) of the landfill footprint showing elevation contours, natural ground slopes, drainage patterns, and other topographical features.
- Site Plan – a map that for at least the area within 1km of the landfill footprint includes:
 - The landfill property, landfill site boundary, landfill footprint, and buffer zone.
 - All applicable features in the siting criteria and corresponding distances from the Landfill footprint.
 - Legal property boundaries, rights-of-way and other easements.
 - Topographic contours (1.0 or 0.5 m).
 - UTM Grid (100 -m spacing), north arrow and scale.
 - All existing structures and infrastructure.
 - Tree line areas.
- Site Layout Plan that includes:
 - The Landfill site boundary, Landfill footprint, and buffer zone.



- Landfill facilities including site entrance, fencing, roads, gatehouse, weigh scale, waste and recyclable drop-off and recycling facilities, leachate management works, surface water management works, landfill gas management works, etc.

3.1.2 Additional Requirements

No requirements in addition to the Landfill Criteria have been identified for the development of Site figures.

3.1.3 Gap Analysis

Site figures can be generated for the Landfill Master Plan based on information in existing reference documents and the identification of significant changes to the Site since the development of reference documents.

Existing information contained in the following reference documents can be used to support the completion of the Site figures:

- Legal surveys: Based on discussions with City staff a legal survey of the landfill property boundaries was completed in December 2016 and can be included in the used to support the development of the Landfill Master Plan.
- 2016 topographical survey: Based on discussions with City staff a topographical survey of the Site was completed in 2016 and can be used to support the development of Landfill Master Plan.
- Water Well Survey and Bedrock Geology Review in the Vicinity of the Glenmore Landfill – 2105 Glenmore Road North, Kelowna, BC (Golder Associates Ltd., SLR, 2015)
- 2015 Annual Water Quality Monitoring Report (Golder Associates Ltd., 2016)
- Glenmore Landfill Geotechnical Investigation and Analyses Report (CH2MHILL, 2015)
- Hydrogeological Assessment of Bedrock Faults in Terms of Their Potential to Support Off-Site Groundwater and Leachate Migration – Glenmore Landfill Kelowna, BC (Golder Associates Ltd., 2014)
- Landfill Gas Management Facilities Design Plan (Final) (CH2MHILL, 2012)
- Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008)
- Final Draft Surface Water Management Plan Glenmore Landfill (CH2MHILL, 2006)

3.1.4 Deliverable

Deliverables for the Site figures should consist of the following figures to be included in the Landfill Master Plan:

- Topographical figure
- Site Plan
- Site Layout



3.2 Physical Summary

3.2.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain the following Site physical summary information:

- Site geology
- Site hydrogeology
- Site hydrology
- Site climactic conditions

3.2.2 Additional Requirements

No requirements additional to the Landfill Criteria have been identified for the development of the Site physical summary.

3.2.3 Gap analysis

Site physical summary information can be adapted from information in existing reference documents. The Site physical summary should also consider any updates required based on identified significant changes to the Site since the completion of the applicable reference documents.

The Site physical summary may adapted from information contained in the following reference documents:

- Surface Water and Groundwater Management Strategy – City of Kelowna Glenmore Landfill (Golder Associates Ltd., 2016)
- Water Well Survey and Bedrock Geology Review in the Vicinity of the Glenmore Landfill – 2105 Glenmore Road North, Kelowna, BC (Golder Associates Ltd., SLR, 2015)
- Glenmore Landfill – Technical Review (CH2MHILL, 2014a)
- Landfill Gas Collection Efficiency Study Glenmore Landfill Site (CH2MHILL, 2015)
- Glenmore Landfill Geotechnical Investigation and Analyses Report (CH2MHILL, 2015)
- Hydrogeological Assessment of Bedrock Faults in Terms of Their Potential to Support Off-Site Groundwater and Leachate Migration – Glenmore Landfill Kelowna, BC (Golder Associates Ltd., 2014)
- 2015 Annual Water Quality Monitoring Report (Golder Associates Ltd., 2016)
- Landfill Gas Management Facilities Design Plan (Final) (CH2MHILL, 2012)
- Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008)
- Final Draft Surface Water Management Plan Glenmore Landfill (CH2MHILL, 2006)
- Glenmore Landfill - South Ground Water Monitor Installation (Gartner Lee, 2000)



3.2.4 Deliverable

The deliverable should consist of a section in the Landfill Master Plan presenting the Site physical summary.

3.3 Geotechnical and Seismic Assessment

3.3.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain a Site geotechnical and seismic assessment containing the following information:

- Bearing capacity, differential settlement, slope stability during construction, operation, and post-closure.
- Seismic and fault activity risk assessment.
- Any effects on the landfill base liner and leachate collection system.

3.3.2 Additional Requirements

In order to support future planning for borrow material the City also requires the development of a geotechnical investigation of Tutt and Bredin Mountain located adjacent to the Site including the following information:

- Identification of suitable borrow material site(s) for intermediate cover and road construction.
- Slope stability analysis of identified borrow material site(s).

3.3.3 Gap analysis

The Geotechnical Investigation and Analysis Report (CH2MHill, 2015) satisfies the requirement of the Landfill Criteria to complete a geotechnical and seismic assessment.

GHD recommends that the Geotechnical Investigation and Analysis Report and the following reference documents be reviewed and referenced in the Landfill Master Plan:

- Ultimate Long Term Filling Plan and Development Consideration for the Glenmore Landfill (CH2MHill, 2014b)
- Geotechnical Investigation and Analysis Report (CH2MHill, 2015)
- Glenmore Landfill – Technical Review (CH2MHILL, 2014a)
- Water Well Survey and Bedrock Geology Review in the Vicinity of the Glenmore Landfill – 2015 Glenmore Road North, Kelowna, BC (Golder Associates Ltd., SLR, 2015)
- Glenmore Landfill - South Ground Water Monitor Installation (Gartner Lee, 2000) Geotechnical Investigation Proposed Leachate Collection System, Glenmore Road Landfill, Kelowna, B.C (EBA Engineering Consultants Ltd., 1998)

Reference documents do not contain geotechnical information on Tutt and Bredin Mountains. A geotechnical investigation will need to be conducted to investigate the suitability of Tutt and Bredin mountains to complete the assessment of suitable borrow site(s).



3.3.4 Deliverables

Deliverables for the geotechnical and seismic assessments should consist of:

- A technical memorandum presenting the results of geotechnical investigations of Tutt and Bredin Mountains. The technical memorandum should also be included in the Landfill Master Plan as an appendix.
- Landfill Master Plan section summarizing the results of Tutt and Bredin Mountain and Site geotechnical/seismic investigations.

3.4 Groundwater and Surface Water Impact Assessment

3.4.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain a groundwater and surface water impact assessment including the following information:

- Groundwater and surface water impact assessment at the site boundary or within 150 metres (m) of the landfill footprint, whichever is closer, and beyond the landfill site boundary including current and planned future uses of groundwater and surface water within 1 km of the landfill footprint.
- The applicable water quality criteria and compliance monitoring locations.
- A summary of water quality monitoring results to date, up-gradient and down-gradient surface water and groundwater quality, identification of landfill parameters of concern, leachate quality, contaminant concentrations, mass loadings, trends, assimilative capacity and cumulative impacts.

3.4.2 Additional Requirements

No additional requirements have been identified for the development of the groundwater and surface water impact assessment.

3.4.3 Gap analysis

Additional analysis of the existing data and/or additional investigations may be required to develop the following components of the groundwater and surface water impact assessment:

- Upgradient and downgradient surface water and groundwater quality
- Contaminant mass loading
- Site water balance
- Cumulative impacts

Considerable data is available to complete the groundwater and surface water impact assessment. The following reference documents may be used to support the completion of the groundwater and surface water impact assessment:

- Surface Water and Groundwater Management Strategy – City of Kelowna Glenmore Landfill (Golder Associates Ltd., 2016)



- 2015 Annual Water Quality Monitoring Report (Golder Associates Ltd., 2016)
- 2015 Glenmore Landfill Annual Report (City of Kelowna, 2016)
- Glenmore Landfill – Technical Review (CH2MHILL, 2014a)
- Water Well Survey and Bedrock Geology Review in the Vicinity of the Glenmore Landfill – 2105 Glenmore Road North, Kelowna, BC (Golder Associates Ltd., SLR, 2015)
- 2014 Annual Water Quality Monitoring Report (Golder Associates Ltd., 2015)
- Hydrogeological Assessment of Bedrock Faults in Terms of Their Potential to Support Off-Site Groundwater and Leachate Migration – Glenmore Landfill Kelowna, BC (Golder Associates Ltd., 2014)
- Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008)
- Final Draft Surface Water Management Plan Glenmore Landfill (CH2MHILL, 2006)
- Hydrogeological and Water Quality Review (CH2MHILL, 2004)
- Glenmore Landfill Hydrogeological Investigations (Gartner Lee, 1992)
- Geotechnical Investigation Pond Relocation Sanitary Landfill Site (Golder Associates Ltd, 1992)

3.4.4 Deliverables

The deliverable should consist of a section in the Landfill Master Plan presenting the groundwater and surface water impact assessment.

3.5 Landfill Design

3.5.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain landfill design including designs that demonstrate the landfill will satisfy all sections of the Landfill Criteria along with necessary plans, specifications, drawings, elevations sections, etc.

3.5.2 Additional Requirements

The City requires that the Landfill design be completed in coordination with the development of the filling and progressive closure plans, and incorporate existing infrastructure, as appropriate. The landfill design should be developed to ensure that future development of the landfill does not require unnecessary changes of infrastructure (e.g. filling should not occur on potential locations of future leachate treatment buildings or proposed compost facility location).

3.5.3 Gap Analysis

The landfill design can be completed based on information contained in the Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008), and the memo entitled Ultimate Long Term Filling Plan and Development Considerations for the Glenmore Landfill (CH2MHill, 2014c) as well as identification of Site equipment/procedures and development contained in the Landfill Master Plan. Based on



a review of the reference documents the landfill design is well defined and the information in the existing documents can be referenced to update the Landfill Master Plan.

3.5.4 Deliverables

Deliverables for the landfill design should consist of:

- A drawing package with explanatory notes on the drawings
- A section in the Landfill Master Plan summarizing the infrastructure identified in the landfill design.

3.6 Filling and Progressive Closure Plan

3.6.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain a filling and progressive closure plan including the following information:

- Phasing Plan showing areas to be progressively closed.
- Plan area of each progressive closure.
- Schedule for each progressive closure.
- Proposed cover system profile, defining materials and material properties for each cover system layer. Specifications for the revegetation strategy should also be included.
- Stability analysis demonstrating the cover system will be stable under design storm conditions.
- Analysis of landfill gas production and the need for venting of LFG from beneath the cover system.
- A materials management plan indicating the quantity of each material required for closure, where it will be sourced, and where it will be stored on-site during closure construction.

3.6.2 Additional Requirements

The City requires that the filling and progressive closure plan include the infrastructure planned to be present during each filling stage. The filling stages should provide sufficient detail to develop conceptual capital cost estimates for each landfill stage. The filling and progressive closure plan should include roads, surface water management works, landfill gas piping, landfill gas wells, leachate collection piping, borrow area(s), material storage area and any other planned infrastructure.

3.6.3 Gap Analysis

The Ultimate Long Term Filling Plan and Development Consideration for the Glenmore Landfill (CH2MHill, 2014b) (2014 Fill Plan) presents a base for developing a more detailed filling and progressive closure plan, including a breakdown of the phasing plan and progressive closure strategy.

The 2014 Fill Plan closure plan will need to be reviewed and further developed to include proposed infrastructure developments at each stage of development including roads for each phase, planned



infrastructure developments (i.e. leachate pumping/treatment facility, landfill gas collection system, compost facility, borrow areas)

The Filling Plan and the following reference documents should be reviewed, referenced and updated as required to complete the filling and progressive closure plan:

- Ultimate Long Term Filling Plan and Development Consideration for the Glenmore Landfill (CH2MHill, 2014b)
- Ultimate Long Term Filling Plan Financial Model Update for the Glenmore Landfill (CH2MHill, 2014c)
- Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008)
- Landfill Gas Management Facilities Design Plan (Final) Glenmore Landfill Site (CH2MHILL, 2012)

3.6.4 Deliverables

Deliverables for the filling and progressive closure plan should consist of:

- A drawing package with explanatory notes on drawings and in text as necessary.
- A section in the Landfill Master Plan summarizing the filling and progressive closure plan.

3.7 Lifespan Analysis

3.7.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain a lifespan analysis table including projected annual waste tonnage to be received, reused, recycled, burned, and landfilled and the annual air space consumed.

Calculation shall account for air space consumed by waste, cover, road material, settlement, and environmental control works including landfill base liner, leachate and landfill gas collection works, and final cover.

3.7.2 Additional Requirements

No requirements in addition to the Landfill Criteria have been identified for the development of the lifespan analysis.

3.7.3 Gap Analysis

The landfill lifespan analysis can be adapted using the updated tonnage data from the on-Site scale house, topographical data provided by the City of Kelowna and the proposed filling and progressive closure plan. The following reference documents may also provide information for use in the lifespan analysis:

- 2015 Glenmore Landfill Annual Reports (City of Kelowna, 2016)
- 2016 and 2015 topographical surveys
- 2014 Glenmore Landfill Annual Report (City of Kelowna, 2015)



- Ultimate Long Term Filling Plan and Development Consideration for the Glenmore Landfill (CH2MHill, 2014b)
- Ultimate Long Term Filling Plan Financial Model Update for the Glenmore Landfill (CH2MHill, 2014c)
- Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008)

3.7.4 Deliverables

The deliverable should consist of a section in the Landfill Master Plan summarizing the lifespan analysis including a filling forecast table.

3.8 Contaminating Lifespan Assessment

3.8.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain a contaminating lifespan estimate of the site for key contaminants. The assessment should demonstrate that the service life and contaminating lifespan will be satisfied for the facilities identified in the design.

3.8.2 Additional requirements

No requirements in addition to the Landfill Criteria have been identified for the development of the contaminating lifespan assessment.

3.8.3 Gap Analysis

A contaminating lifespan assessment has not been completed to date. The existing database of historical leachate and groundwater data can be used as inputs in to the development of the contaminating lifespan assessment.

3.8.4 Deliverables

Deliverables for the contaminating lifespan assessment should consist of:

- A technical memorandum presenting the inputs, assumptions, and results of the contaminating lifespan assessment. The technical memorandum should also be included in the Landfill Master Plan as an appendix.
- Landfill Master Plan section summarizing the results of the contaminating lifespan assessment.

3.9 Surface Water Management Plan

3.9.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain a surface water management developed in coordination with filling and progressive closure plan which contains the following information:

- Demonstration that Landfill Criteria performance criteria are satisfied throughout the life of the Landfill.



- Description of potential for surface water impairment and resulting impacts and how they will be addressed.
- Demonstration of an understanding of the local and regional watershed and that the natural hydrologic cycle is preserved.
- Documentation of surface water management on site including both run-on and run-off, measures to promote diversion of clean water (to minimize leachate production and promote groundwater recharge) and to protect the surface water quality in off-site surface water bodies receiving drainage from the landfill site.
- Explanation of means to address management of surface water during operations and post-closure, including how surface water will be managed to prevent interruptions to Site operations.
- Demonstration that design will maintain run-off from the Site with minimal sediment and at rates that are consistent with pre-development flows.
- Identification of surface water management works required for the control of erosion, sediment transport, flood risk, water quantity and water quality.
- Site meteorological data.
- Designs for surface water management works throughout the operating and post-closure period of the Landfill including ditches, down-chutes, culverts, retention ponds and other surface water control infrastructure.
- Demonstration that the surface water management plan has been developed in a manner consistent with the water management requirement strategies utilized in developing the leachate management plan and the groundwater and surface water impact assessment.

3.9.2 Additional Requirements

In addition to the surface water from the landfill footprint, the City operates surface water ponds to manage surface water from adjacent areas outside of the landfill footprint. The water from these surface water ponds is used for irrigation of adjacent City owned fields. The City requires that the surface water ponds be included in the overall Site surface water management plan.

3.9.3 Gap Analysis

The surface water management plan will need to be developed based on the updated filling and progressive closure plan to be developed as a part of the Landfill Master Plan. The following reference documents may also be used to support the development of a surface water management plan:

- Surface Water and Groundwater Management Strategy City of Kelowna Glenmore Landfill (Golder Associates Ltd., 2016)
- 2015 Annual Water Quality Monitoring Report (Golder Associates Ltd., 2016)
- Final Comprehensive Site Development Plan Glenmore Landfill (CH2MHILL, 2008)
- Surface Water Management Plan Glenmore Landfill (CH2MHILL, 2006)



3.9.4 Deliverable

Deliverables for the surface water management plan should consist of:

- A technical memorandum presenting the results of the surface water modelling for the landfill area, under final, post-closure conditions, including a drawing package presenting the design of surface water management works utilised in the model. The technical memorandum should also be included in the Landfill Master Plan as an appendix.
- A drawing package presenting designs sufficient to serve as the basis for construction during operations (30% design level), closure and post-closure periods containing designs that will maintain run-off from the site sediment free and at rates that are consistent with pre-development flows, designs for surface water control works and detailed design of the ditches, down-chutes, culverts, retention ponds and other surface water control infrastructure.
 - The surface water management plan should also include a description of the operation and maintenance of the surface water works (e.g. removal of sediment, vegetation management, etc.).
- A Landfill Master Plan section presenting the proposed surface water management plan.

3.10 Leachate Management Plan

3.10.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain a Leachate Management Plan (LMP) which includes the information below. The City has selected (and is currently operating) a leachate management system consisting of pre-treatment and discharge to the City sewer therefore an assessment of alternatives is not included in the list below.

- The LMP should demonstrate that the method of leachate collection, storage, treatment and discharge meets the requirements of the landfill design that is protective of groundwater, surface water and the surrounding environment
- Demonstrate the performance criteria will be satisfied
- Present treatment system selection (i.e. leachate recirculation, pre-treatment and disposal in municipal sewer) and design
- Demonstrate that the preferred treatment alternative is practical and implementable and provide an implementation schedule for the preferred alternative
- Identify the required approvals for implementation of the LMP if off-site disposal/treatment is proposed
- Consideration of the leachate quantity and quality that will be generated during landfill operations and post-closure
- Identify the quantity of leachate that will be generated on a phase by phase basis, both under average and extreme conditions
- Leachate chemistry profiles (actual and expected)



- Landfill liner strategy including confirmation of the compatibility of liner strategy with leachate chemistry profile and lifespan
- The most appropriate method of leachate collection (including protection from clogging), storage, treatment and discharge on a site-specific basis
- Sludge management
- Treatment system performance monitoring and maintenance
- Leachate discharge strategy
- A leachate management contingency plan

3.10.2 Additional Requirements

The City requires that the LMP be developed based on the current leachate management operations (i.e. leachate collection, recirculation, treatment and disposal). The City intends to undertake a review of the long term leachate treatment and pumping strategy which is expected to include the identification of alternative long-term (10 years+) leachate treatment methods and facilities. The potential future upgrades to the leachate treatment system are outside the scope of the Landfill Master Plan update but estimating the long-term leachate generation rates and volume to be treated is in the scope of the Landfill Master Plan update.

3.10.3 Gap Analysis

There is currently no dedicated LMP for the Landfill. An LMP will need to be developed based on existing reference documents, data review/interpretation and/or requests for exemptions from the MOE. The following components of the LMP are not present in existing documents and will need to be developed by completing additional investigations and/or obtaining exemptions from the MOE as necessary:

- Define the long-term sustainability of the current leachate discharge to City sewer by completing the following:
 - Identify permissible sewer disposal rate volume
 - Identify current and long term leachate generation rates under average and extreme conditions for annual, monthly and peak flows and compare to permissible sewer disposal rate
- Confirm compatibility of liner strategy with leachate chemistry profile
- Document leachate chemistry profile
- Document treatment system operation, performance criteria and maintenance requirements including sludge management practices
- Develop leachate management contingency plan

The following components of the LMP may be adapted from information in existing reference documents:

- Present treatment system selection (i.e. leachate recirculation, pre-treatment and disposal in municipal sewer) and design



- Landfill liner strategy
- The method of leachate collection (including protection from clogging), storage, treatment and discharge on a site-specific basis
- Demonstration that the method of leachate collection, storage, treatment and discharge meets the requirements of the landfill design that is protective of groundwater, surface water and the surrounding environment

The following reference documents may be used to develop the above noted components:

- 2015 Annual Water Quality Monitoring Report (Golder Associates Ltd., 2016)
- Water Well Survey and Bedrock Geology Review in the Vicinity of the Glenmore Landfill – 2105 Glenmore Road North, Kelowna, BC (Golder Associates Ltd., SLR, 2015)
- 2014 Annual Water Quality Monitoring Report (Golder Associates Ltd., 2015)
- Glenmore Landfill – Technical Review (CH2MHILL, 2014a)
- Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008)
- Geotechnical Investigation Proposed Leachate Collection System, Glenmore Road Landfill, Kelowna, B.C (EBA Engineering Consultants Ltd., 1998)
- City of Kelowna Glenmore Landfill North Area Development and South Area Closure (UMA Engineering Ltd., Gartner Lee Limited, 1996)

3.10.4 Deliverables

The deliverable for the leachate management plan should consist of a section in the Landfill Master Plan and the presentation of the leachate collection system in the Landfill Master Plan drawing package. The leachate quantity and quality should be tabulated and represent the existing and forecast conditions.

3.11 Landfill Gas Management Plan

3.11.1 Landfill Criteria Requirements

For this Site, the regulatory LFG generation threshold has been reached (e.g. the Landfill generates over 1,000 tonnes of CO₂ Equivalent), therefore the Landfill Criteria requires that a Landfill Gas Management Facilities Design Plan be developed for the Site.

3.11.2 Additional Requirements

The Landfill Gas Management Regulation requires that a Landfill Gas Management Facilities Design Plan be developed and submitted to the MOE. The Landfill Gas Management Facilities Design Plan should be completed in accordance with the Landfill Gas Management Facilities Design Guidelines (Conestoga-Rovers & Associates, 2010).



The City requires that the LFG management plan be developed in coordination with the filling and progressive closure plan. Specifically, scheduling of LFG infrastructure development should be forecast based on forecast filling rates to aid in budgeting and construction planning purposes.

3.11.3 Gap Analysis

The existing LFG Facilities Design Plan (CH2MHILL, 2012) meets the requirements of the Criteria and can be referenced in the Landfill Master Plan update.

3.11.4 Deliverables

Deliverables for the LFG management plan should consist of:

- The LFG Facilities Design Plan included in the Landfill Master Plan as an appendix.
- A section in the Landfill Master Plan summarizing the LFG Facilities Design Plan, any identified required revisions, scheduling and budgeting level cost estimates for construction of LFG infrastructure.

3.12 Environmental Monitoring Plans

3.12.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain an environmental monitoring plan (EMP) for leachate, groundwater, surface water and LFG which satisfies the following:

- Compliance with the performance criteria consistent with plans/reports
- The need for groundwater monitoring within 1 km of the landfill footprint is addressed
- Be developed in accordance with the Ministry of Environment's "Guidelines for the Environmental Monitoring at Municipal Solid Waste Landfills" for groundwater surface water leachate and soils and vegetation or its approved replacement
- Groundwater and surface water monitoring results are assessed for compliance with applicable guidelines and a rationale is provided for selecting the applicable guidelines
- Groundwater, surface water and leachate EMPs have been developed based on the:
 - Hydrogeology and Hydrology Characterization Report
 - Groundwater Impact Assessment
 - Expected Landfill performance
- LFG extraction well leachate level monitoring
- Pore pressures are maintained at acceptable levels to prevent slope instability
- Leachate is monitored to characterize leachate indicator parameters
- Monitoring of methane concentrations in the on-site buildings and at the Site property boundary



3.12.2 Additional Requirements

No requirements in addition to the Landfill Criteria have been identified for the development of the EMP.

3.12.3 Gap Analysis

Environmental monitoring plans (EMPs) for leachate, groundwater, surface water and LFG are presented in the 2015 Annual Water Quality Monitoring Report (Golder Associates Ltd., 2016) and the Landfill Gas Facilities Design Plan (CH2MHILL, 2012). Based on a review of the reference documents the EMP is well defined and the information in the existing documents can be referenced to update the Landfill Master Plan.

The EMP should also be updated to account for any additional changes to the Landfill proposed or completed prior to or during the development of the Landfill Master Plan (e.g. leachate treatment, installation of additional groundwater monitoring wells, identification of additional surface water sampling locations).

3.12.4 Deliverables

The deliverable for the EMP should consist of:

- Landfill Master Plan section summarizing the EMP. The EMP should be included in the Landfill Master Plan as an appendix. After adoption of the Landfill Master Plan, the EMP will be included and updated during development of the Landfill annual report.

3.13 Facility Operations Plan

3.13.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain a facility operations plan which:

- Demonstrates how all site facilities will be operated in compliance with the operation criteria e.g. filling procedures, leachate and surface water management works, vegetation and sediment management etc.
- Presents the design of the nuisance control measures is to be included in the plan.

3.13.2 Additional Requirements

In addition to the Landfill Criteria requirements, the City requires that the landfill operation plan include details of borrow and material storage areas.

3.13.3 Data Gaps

There is currently no dedicated facility operation plan for the Site. The Site facility operations plan can be developed based on information contained in existing documents and the identification of Site equipment/procedures developed subsequent to the Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008). The following reference documents may be used to develop the above noted components:

- 2015 Glenmore Landfill Annual Reports (City of Kelowna, 2016)
- 2014 Glenmore Landfill Annual Reports (City of Kelowna, 2015)



- Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008),

Based on discussions with City staff a compost facility development report was completed in 2017 the results of which should be used to support the facility operations plan.

3.13.4 Deliverables

The deliverable should consist of a section in the Landfill Master Plan presenting the facility operations plan.

3.14 Closure Plan

3.14.1 Landfill Criteria Requirements

The Landfill Criteria requires the Landfill Master Plan contain a closure plan consisting of:

- Plans for post-closure operations and maintenance of general site facilities (e.g. roads, fencing &c.), overall facility, final cover, surface water management works, leachate collection and on-site leachate treatment facility/leachate plan, and LFG management facilities.
- Post-closure EMP for the contaminating lifespan of the Landfill
- Practical and implementable contingency measures to address failure of the works or non-compliance with the performance criteria.

3.14.2 Additional Requirements

No requirements in addition to the Landfill Criteria have been identified for the development of the closure plan.

3.14.3 Data Gaps

There is currently no dedicated closure plan for the Site. The closure plan can be adapted from information contained in the Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008), the filling and progressive closure plan and the Landfill EMP.

3.14.4 Deliverables

Deliverables for the closure plan should consist of:

- A drawing package with explanatory notes. The drawing package for the closure plan should be developed with the filling and progressive closure plan with drawings submitted as a combined package.
- A section in the Landfill Master Plan summarizing the closure plan.



3.15 Fire Safety and Emergency Response Plan

3.15.1 Landfill Criteria Requirements

The Landfill Criteria requires that a fire safety and emergency response plan be developed for the Site which includes:

- Description of how fire risks will be minimized.
- Emergency response plan to quickly extinguish a fire if one develops.
- Identification of a suitable water supply, firefighting and heavy equipment resources.
- Documentation of strategies for dealing with emergencies at the site including HAZ-MAT incidents, fires, spills, power outages, communication equipment failures and extreme weather events.
- Demonstration that the landfill meets the requirements of Work Safe BC.

3.15.2 Additional Requirements

No requirements in addition to the Landfill Criteria have been identified for the development of the fire safety and emergency response plan.

3.15.3 Data Gaps

There is currently no dedicated Site wide fire safety and emergency response plan. The fire safety plan can be adapted from information contained in the Comprehensive Site Development Plan Glenmore Landfill (Final) (CH2MHILL, 2008), the fire safety plan currently in place for the site administration building and the identification of Site equipment/procedures.

3.15.4 Deliverables

Deliverables for the fire safety and emergency response plan should consist:

- A fire safety and emergency response plan report for use throughout the Site and for submittal to the local fire authority. The fire safety and emergency response plan should be included in the Landfill Master Plan as an appendix.
- A Landfill Master Plan section summarizing the fire safety and emergency response plan.

3.16 Contingency Plan

3.16.1 Landfill Criteria Requirements

The Landfill Criteria requires that a contingency plan be developed for the Site which includes:

- Identification of possible failure and non-compliance scenarios of the leachate, surface water, and LFG management facilities.
- Documentation of practical and implementable contingency measures to address any failure or non-compliance with performance criteria.



3.16.2 Additional Requirements

No requirements in addition to the Landfill Criteria have been identified for the development of the contingency plan.

3.16.3 Data Gaps

There is currently no contingency plan for the Site. The contingency plan should be developed based on an assessment of the failure scenarios of the Landfill environmental controls in the Landfill Master Plan.

3.16.4 Deliverables

The deliverable for the contingency plan should consist of a Landfill Master Plan section presenting the contingency plan.

3.17 Land Survey

3.17.1 Landfill Criteria Requirements

The Landfill Criteria requires that the Landfill Master Plan contain an up to date land survey which includes:

- An up-to-date land survey.
- Identification of landfill site boundary and the landfill footprint.
- Procedures for maintaining the limits of the landfill footprint and landfill site boundary in the based on the land survey and Site equipment/procedure.

3.17.2 Additional Requirements

The City has recently completed additional legal surveys that require consolidation into a Site wide legal plan.

3.17.3 Data Gaps

Based on discussions with City Staff a legal survey of the landfill properties was completed in December 2016 and a topographic survey was completed in 2015. The legal survey figure should be developed based on the legal survey conducted in 2016 and information from the consolidation of other legal surveys.

3.17.4 Deliverables

Deliverables for the land survey should consist of:

- A Site figure included in the Landfill Master Plan.
- A Landfill Master Plan section summarizing the legal boundaries of the Landfill and any easements and/or rights of way.



3.18 Materials Management Plan

3.18.1 Landfill Criteria Requirements

The Landfill Criteria requires that a materials management plan be developed for landfill closure materials and included in the filling and progressive closure plan. The material management plan must include the type, quantity, source and on-site storage location for each material required over the life of the landfill.

3.18.2 Additional Requirements

The City requires that a long-term materials management plan be developed for the Site. The long-term materials management plan should identify the areas of material management (e.g. compost, cover materials, municipal solid waste etc.) and present forecasts of future materials to be segregated and processed on-Site.

3.18.3 Data Gaps

The materials management plan should be based on planned development as described in the Landfill Master Plan. Based on discussions with City staff a compost facility development report was completed in 2017 which can be used to support the materials management plan.

3.18.4 Deliverable

Deliverables should consist of a section in the Landfill Master Plan presenting materials management plan with accompanying tables for each development stage.

3.19 Cost Forecast and Liability Estimate

3.19.1 Landfill Criteria Requirements

The Landfill Criteria does not require a cost forecast and liability estimate for publicly owned landfills.

3.19.2 Additional Requirements

Municipalities are required to report landfill liability estimates in accordance with the Canadian Public Sector Accounting Standard, Section PS 3270 – Solid Landfill Closure & Post Closure Liability. The liability estimates are based on present value of the closure and post-closure costs of the currently constructed landfill footprint multiplied by the fraction of current capacity over total design capacity constructed.

A forecast of operational and capital costs should be developed based on implementation of the works presented in the Landfill Master Plan and operation of the Landfill. The development of a cost forecast will aid in capital planning and will present the life-cycle cost of the designs to be submitted to the MOE in the Landfill Master Plan.

3.19.3 Data Gaps

The cost forecast and liability estimate should be developed based on the information contained in the Landfill Master Plan.



3.19.4 Deliverables

The deliverable for the cost forecast and liability estimate should be a report or memorandum presented under separate cover from the Landfill Master Plan as this deliverable will not be submitted to the MOE.

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Attachment 2

Upgrading Plan Actions Tracking

Item #	DOCP Section	Task Description	June 11 2020 Status	2021 Q1 Status	2022 Q1 Status
Site Operations					
1	4.6	Update Nuisance Impact Assessment with more Site specific data (dust, odour, etc.)	Nuisance modelling using CALPUFF completed by GHD and reported under separate cover. Results of nuisance modelling to be briefly summarized in Upgrading Plan updates or Annual Reports	Nuisance modelling using CALPUFF completed by GHD and reported under separate cover. Results of nuisance modelling to be briefly summarized in Upgrading Plan updates or Annual Reports	Completed in 2021. Additional Nuisance Monitoring stations for dust and odour installed as a proactive measure in 2021. System continues to be refined. This item will be removed from future Ugrading Plan updates.
2	12.8	Fire break 15 metres around landfill footprint.	City to undertake this task. The completion of this task will be documented in the Upgrading Plan updates or Annual Reports	Some initial work was completed in 2020. Additional ongoing budget approved for annual work to be completed by a contractor starting in 2021.	Completed in 2021. This item will be removed from future Ugrading Plan updates.
3	15.3	Landfill Gas (LFG) Generation Assessment required in 2021 (5 year review)	City to retain a consultant to complete this work in 2021	This work should be completed by Q3 of 2021 and will be submitted as a stand alone report when available.	Updates have been provided annually as part of the Landfill Gas Collection Efficiency Report. An updated stand alone version will be made available in 2022 for simplicity. This item will be removed from future Ugrading Plan updates.
4	15.5	LFG management - confirm Safe Work Procedures (SWP), training, best management practices (BMPs) for protection and signage	City to undertake this task. The completion of this task will be documented in the Upgrading Plan updates or Annual Reports	Assigned to the Landfill Environmental Techs and to be completed in 2021.	Completed in 2021. This item will be removed from future Ugrading Plan updates.
5	Fill Plan	Conceptual design for Area 2 including access roads, leachate management infrastructure, etc.	City has retained WSP to undertake this work.	Completed, area 2 was substantially constructed in 2020 with paving to be completed in 2021. As built provided by WSP to be included in the 2020 Annual report.	Completed as part of 2021 Annual Report. This item will be removed from future Ugrading Plan updates.
6	6.8	Maintain leachate levels below 437 metres above mean sea level (m AMSL) in the Slough. Consider installing a SCADA system to alarm the City if leachate levels are approaching the 437 m AMSL threshold	City to undertake this task. The completion of this task will be documented in the Upgrading Plan updates or Annual Reports	The City uses Proficy Portal to manually monitor the leachate levels in Leachate 1 and 2 and will confirm these are representative of leachate levels with manual measurements. Levels might vary across the site depending on the elevation from North to South.	The City uses Proficy Portal to manually monitor the leachate levels in Leachate 1 and 2 and will confirm these are representative of leachate levels with manual measurements. Levels might vary across the site depending on the elevation from North to South. This item will be removed from future Ugrading Plan updates.
Organics Facility					
7	-	Conceptual design for new location of the organics facility on Site. Ensure new location for organics facility meets requirements of the Organic Matter Recycling Regulation	City to retain a consultant to complete this work	In progress, WSP retained to perform this work. Design/Build RFP pending for 2021.	RFP issued in 2021 and ECS retained to complete Aerated Static Pile (ASP) design and supply. WSP to complete full design of area in 2022 with construction of ASP in 2023.
Site Administration					
8	12.3.3	OC Amendment to expand contaminated soil acceptance criteria	City has retained GHD to support this application.	In progress. Application submitted, and awaiting draft of revised Operational Certificate from BC MoECC in early 2021. Required expiration of the Provincial Order in Council that occurred in January 2021.	In progress. Application submitted, and awaiting draft of revised Operational Certificate from BC MoECC in early 2021. BC MoECC provided a draft OC in late 2021. City personnel are reviewing this with GHD Consulting and Corporate Legal Counsel in Q1 of 2022.
9	Appendix C	Financial Security Plan	City has undertaken and completed this task. This will be documented in the Upgrading Plan updates and Annual Reports.	Completed in 2020.	No further actions required. This item will be removed from future Ugrading Plan updates.
Site Geotechnical Investigations					
10	10.2 - 10.3	Additional geotechnical/liquefaction assessment	City to retain a consultant to complete this work. Results of geotechnical assessment will be documented under separate cover and briefly summarized in the Upgrading Plan	Scheduled as future work (2023 - 2025) to include the Groundwater Impact Assessment	Scheduled as future work (2023 - 2025) to include the Groundwater Impact Assessment

Item #	DOCP Section	Task Description	June 11 2020 Status	2021 Q1 Status	2022 Q1 Status
Environmental Monitoring					
11	11.1	Groundwater impact assessment - additional sets of nested wells to be installed in the southern portion of the Site.	Additional monitoring wells installed. The wells will be included in the Site's monitoring program to provide groundwater data for the Groundwater Impact Assessment. Results of Impact Assessment to be provided under separate cover	Four additional nested wells installed in late 2019 (three sets to the South and one set to the North) and baseline monitoring is underway.	Completed in 2019. This item will be removed from future Ugrading Plan updates.
12	11.1	Implement recommended changes to the Site's environmental monitoring program including: background groundwater/surface water locations, surface water locations, hydraulic levels, new monitoring wells, and leachate samples	City to collect additional water quality data over the next 1 to 2 years to characterize the new sampling locations. Results to be incorporated into Impact Assessment Report and Annual Reports	Changes to the environmental monitoring program implemented and data being collected to establish baseline. Data needed to complete the Impact Assessment in future years.	Completed in 2021. Environmental monitoring amendments will be implemented as required based on future recommendations. This item will be removed from future Ugrading Plan updates.
13	18	Update existing environmental monitoring program sampling events to include additional recommended sampling locations	See DOCP Sec 11.1 status	Completed	Completed in 2019. This item will be removed from future Ugrading Plan updates.
14	18.2.1	Establish a leachate sampling location from lined and unlined areas (or equivalent sampling location).	See DOCP Sec 11.1 status.	New sample location added for Area 1 (P1 Leachate MH-2) to be sampled twice in 2020. Area 2 also has sample location that should be added to 2021 program.	Completed in 2020. This item will be removed from future Ugrading Plan updates.
15	18.4.2	Complete a landfill gas (LFG) migration assessment and install LFG monitors inside Site buildings	City has installed gas monitors in the on site buildings. City to retain a consultant to complete a LFG migration assessment to determine the best locations for LFG probes around the Site. Gas monitoring results to be summarized in Annual Reports	Landfill Gas Migration Assessment to be completed in 2021 by GHD and will be included in the 2021 Annual Report. Additional wells will be scheduled over a number of years starting in 2021. A report evaluating monitoring needs for building was completed by SLR and was submitted as part of the 2018 annual report	Migration Assessment completed in 2021. Wells to be installed in 2022.
16	ENV Inspection letter (Jul 23, 2019)	Complete a background water quality/Robert Lake water quality study to assist in determining background water quality conditions for the Site	See DOCP Sec 11.1 status	In progress, data being acquired by ongoing sampling events as per DOCP Item 11.1 above	In progress, data being acquired by ongoing sampling events as per DOCP Item 11.1 above
Surface Water Management					
17	5	Complete surface water modelling onsite as part of the Northern Pond and diversion pipe design	City has retained WSP to proceed with the design. Design and construction details to be reported under separate cover	Conceptual stormwater design completed by WSP in 2020. In 2021, preliminary design to be split between on-site and off-site work. More detailed modelling required on-site. Off-site exercise based on pipeline flow, alignment and discharge to Brandt's Creek. Application for water license for off-site storage ponds and discharge to Brandt's Creek (2021-2026).	The process has gone to the design phase. The initial conceptual surface water modeling and diversion designs are completed and meters installed to evaluate potential maximum flow rates and for sizing ponds. Additional design work to be completed as part of the downstream permitting and design.
18	12.7.6	Finish berm on John Hindle and re-vegetate the berm along Glenmore	The berm construction/re-vegetation along John Hindle was completed in 2019 by the City. Re-vegetation of the berm along Glenmore will be scheduled after the construction of the surface water diversion pipe is completed.	Berm re-configuration to be included as part of the Storm Water Management Plan and will be re-vegetated when completed (estimated 2026)	Berm re-configuration to be included as part of the Storm Water Management Plan and will be re-vegetated when completed (estimated 2026)
19	13.3	Downstream surface water assessment as part of the Northern Pond construction and stormwater diversion piping to Brandt's Creek permitting (FLNRORD, ENV, ALC, etc.) and design	See DOCP Sec 5 status. City has retained WSP to proceed with the design and assist with required permitting	Flow monitoring stations to be installed in 2021 in selected locations, measuring water flows and water quantity to develop historical data records (surface water run-on vs Leachate) as part of Groundwater Impact Assessment.	The study in support of the water license application has been initiated in 2022. The final Scope of Work was refined with an External Consultant and the agreement to proceed is to be awarded shortly.

Appendix 2

CoK Upgrading Plan Update 2023 03 25

GLENMORE LANDFILL UPGRADING PLAN
UPDATED March 25, 2023

Item #	DOCP Section	Task Description	2021 Q1 Status	2022 Q1 Status	2023 Q1 Status
Site Operations					
6	6.8	Maintain leachate levels below 437 metres above mean sea level (m AMSL) in the Slough. Consider installing a SCADA system to alarm the City if leachate levels are approaching the 437 m AMSL threshold	The City uses Proficy Portal to manually monitor the leachate levels in Leachate 1 and 2 and will confirm these are representative of leachate levels with manual measurements. Levels might vary across the site depending on the elevation from North to South.	The City uses Proficy Portal to manually monitor the leachate levels in Leachate 1 and 2 and will confirm these are representative of leachate levels with manual measurements. Levels might vary across the site depending on the elevation from North to South. This item will be removed from future <u>Upgrading Plan updates</u> .	Due to the retirement of Proficy Portal as a legacy product no longer supported by commercial software, a new system has been install. This new program will need to be incorporated into the landfill SCADA system to allow for ongoing monitoring of data.
Organics Facility					
7	-	Conceptual design for new location of the organics facility on Site. Ensure new location for organics facility meets requirements of the <u>Organic Matter Recycling Regulation</u>	In progress, WSP retained to perform this work. Design/Build RFP pending for 2021.	RFP issued in 2021 and ECS retained to complete Aerated Static Pile (ASP) design and supply. WSP to complete full design of area in 2022 with construction of ASP in 2023.	The first ASP system was designed and purchased in 2022. An updated full site layout design and RFP for construction and installation has been issued and closes in Q1 2023. Installation of the first <u>Aeration pad is expected by the end of 2023.</u>
Site Administration					
8	12.3.3	Operational Certificate (OC) Amendment to expand contaminated soil acceptance criteria	In progress. Application submitted, and awaiting draft of revised Operational Certificate from BC MoECC in early 2021. Required expiration of the Provincial Order in Council that occurred in January 2021.	In progress. Application submitted, and awaiting draft of revised Operational Certificate from BC MoECC in early 2021. BC MoECC provided a draft OC in late 2021. City personnel are reviewing this with GHD Consulting and Corporate Legal Counsel in Q1 of 2022.	The final draft OC and Environmental Protection Notices were completed in Q4 of 2022. The Notice of Intent and Public Consultation process was initiated in December of 2022 and the period to receive comments was extended to early February. The summary consultation report was submitted to Ministry Contacts in February of 2023 and as of the submission of this report the final approved OC has
Site Geotechnical Investigations					
10	10.2-10.3	Additional geotechnical/liquefaction assessment	Scheduled as future work (2023 - 2025) to include the Groundwater Impact Assessment	Scheduled as future work (2023 - 2025) to include the Groundwater Impact Assessment	Additional Geotechnical work to be included as part of the 2023 DOCP update.
Environmental Monitoring					
11	11.1	Groundwater impact assessment - additional sets of nested wells to be installed in the southern portion of the Site.	Four additional nested wells installed in late 2019 (three sets to the South and one set to the North) and baseline monitoring is underway.	Completed in 2019. This item will be removed from future Upgrading Plan updates.	Updated Groundwater and Surface Water Impact Assessment is to be completed as part of the 2023 DOCP update.
12	11.1	Implement recommended changes to the Site's environmental monitoring program including: background groundwater/surface water locations, surface water locations, hydraulic levels, new monitoring wells, and leachate samples	Changes to the environmental monitoring program implemented and data being collected to establish baseline. Data needed to complete the Impact Assessment in future years.	Completed in 2021. Environmental monitoring amendments will be implemented as required based on future recommendations. This item will be removed from future Upgrading Plan updates.	Completed.
16	ENV Inspect letter (2019 08 23)	Complete a background water quality/Robert Lake water quality study to assist in determining background water quality conditions for the Site	In progress, data being acquired by ongoing sampling events as per DOCP Item 11.1 above	In progress, data being acquired by ongoing sampling events as per DOCP Item 11.1 above	Background water quality study to be completed as part of the 2023 DOCP update.
Surface Water Management					
17	5	Complete surface water modelling onsite as part of the Northern Pond and diversion pipe design	Conceptual stormwater design completed by WSP in 2020. In 2021, preliminary design to be split between on-site and off-site work. More detailed modelling required on-site. Off-site exercise based on pipeline flow, alignment and discharge to Brandt's Creek. Application for water license for off-site storage ponds and discharge to Brandt's Creek (2021-2026).	The process has gone to the design phase. The initial conceptual surface water modeling and diversion designs are completed and meters installed to evaluate potential maximum flow rates and for sizing ponds. Additional design work to be completed as part of the downstream permitting and design.	Additional design, licensing, and permitting reviews started in 2022. This work will continue through 2023 with considerations of alignment of this system to the updated DOCP, need for Statutory Right of Ways, design impacts on the Agricultural Land Reserve, etc. This work is expected to be a multi year project.
18	12.7.6	Finish berm on John Hindle and re-vegetate the berm along Glenmore	Berm re-configuration to be included as part of the Storm Water Management Plan and will be re-vegetated when completed (estimated 2026)	Berm re-configuration to be included as part of the Storm Water Management Plan and will be re-vegetated when completed (estimated 2026)	Will be considered as part of the Surface Water Management Plan in the above line item.
19	13.3	Downstream surface water assessment as part of the Northern Pond construction and stormwater diversion piping to Brandt's Creek permitting (FLNRORD, ENV, ALC, etc.) and design	Flow monitoring stations to be installed in 2021 in selected locations, measuring water flows and water quantity to develop historical data records (surface water run-on vs Leachate) as part of Groundwater Impact Assessment.	The study in support of the water license application has been initiated in 2022. The final Scope of Work was refined with an External Consultant and the agreement to proceed is to be awarded shortly.	Additional design, licensing, and permitting reviews started in 2022. This work will continue through 2023 with considerations of alignment of this system to the updated DOCP, need for Statutory Right of Ways, design impacts on the Agricultural Land Reserve, etc. This work is expected to be a multi year project.

Appendix 3

2022 Jacobs LFG Efficiency Final 20230328

2022 Landfill Gas Collection Efficiency Study – Glenmore Landfill Site

Date:	March 23, 2023	Jacobs Consultancy Canada Inc.
Project name:	2022 Landfill Gas Collection Efficiency Study – Glenmore Landfill Site	Metro Tower II, Suite 2100, 4720 Kingsway Burnaby, BC V5H 4N2 Canada T +1.604.684.3282 www.jacobs.com
Attention:	Darren Enevoldson, City of Kelowna	
Client:	City of Kelowna	
Prepared by:	Chris Kyriazis, Jacobs	
Reviewed by:	Chuck Smith, Jacobs	
Revision no:	Final	
Copies to:	Emily Roney, Jacobs, Scott Hoekstra, City of Kelowna	

1. Introduction

The City of Kelowna (City) has retained Jacobs to provide the 2022 estimated landfill gas (LFG) collection system efficiency for the Glenmore Landfill (Site) located at 2710-2720 John Hindle Drive, Kelowna, British Columbia (BC).

This technical memorandum (TM) has been prepared using two waste composition studies (Tetra Tech 2022, Morrison Hershfield Ltd. 2016) and waste filling data (CH2M 2010, City 2011 to 2022, Enevoldson 2023, pers. comm., and Hoekstra 2023, pers. comm.). The LFG recovery was assessed, along with the factors influencing actual LFG generation and recovery at the Glenmore Landfill (Site). The collection system's efficiency was calculated using the formulas contained within the British Columbia Ministry of Environment and Climate Change Strategy's (BC MOECCS's) LFG Management Facilities Design Guidelines (CRA 2010).

2. Background

The Site is located on Glenmore Road approximately 1.5 kilometres (km) east of Okanagan Lake and 9 km northeast of the Kelowna city centre. The Site is owned and operated by the City, has an estimated available airspace of forty million cubic metres (m³), and expected to reach the design capacity by 2107 (GHD 2018). The Site has been in operation since 1966 (City 2018).

The Site has an active LFG collection system, consisting of 64 vertical wells (in lower waste lifts), more than 60 LFG horizontal trenches in Phases 1 and 2, and a blower and flare station (owned and operated by the City). The collected LFG is routed to a biomethane facility owned and operated by FortisBC for upgrading to pipeline-quality gas. LFG not used by FortisBC is routed to the City's flare station. Both facilities provide continuous active LFG management at the Site.

Landfilling occurred in the Phase 1 and Phase 2 areas during 2022. In 2022, the total buried waste was estimated as 158,871 tonnes (Enevoldson 2023, pers. comm.).

3. Regulatory Framework

On December 8, 2008, a regulation for the management of LFG at British Columbia (BC) regulated landfill sites was ordered and approved by BC MOECCS. In accordance with the Landfill Gas Management Regulation (Regulation), a regulated landfill site has 100,000 tonnes or more of municipal solid waste (MSW) or has received 10,000 or more tonnes of MSW annually for disposal into the landfill site in any

calendar year after 2008 (BC MOECCS 2008). With over 100,000 tonnes annually, Glenmore Landfill is classified as a regulated landfill.

After the landfill falls under the regulation, a qualified professional is required to conduct an initial LFG generation assessment (Assessment) using their knowledge with respect to solid waste and LFG management to select models for LFG estimation, assess results, and provide required recommendations. The Assessment must be conducted in accordance with the most recent edition of LFG guidance documents, as approved by the BC MOECCS Director. The guidance documents include the Landfill Gas Generation Assessment Procedure Guidelines (BC MOECCS LFG Guideline) that was prepared by Conestoga-Rovers & Associates (CRA), dated March 2009, and the Landfill Gas Generation Estimation Tool – for Annual Report (Tool) provided by British Columbia Environmental Protection and Sustainability (BC EPS 2022). Both are available on the BC EPS website and must be used in the preparation of Assessments (CRA 2009). The City submitted its first LFG generation assessment report in 2010 (CH2M 2010).

4. Landfill Gas Generation Assessment Methodology

This section summarizes the information required in the Regulation, in accordance with the BC MOECCS LFG Guideline, Section 4, Information Collection and Synthesis.

4.1. Annual Waste Buried

Table 1 presents the estimated annual amount of MSW disposed of at the Site between 1993 and 2022, as well as the projected volume of waste to be disposed at the Site for 5 years after the annual assessment, which corresponds to the year 2027. Although wastes have been disposed at the Site since 1966, Table 1 shows tonnages from 1993, used to estimate LFG generation using the BC EPS simulation tool.

Tonnes of refuse disposed at the Site between 2010 and 2019 are based on a previous Landfill Gas Collection Efficiency Study (CH2M 2020) while the 2020 and 2021 tonnages of refuse disposed at the Site are based on the 2020 and 2021 annual reports (City 2021, 2022). The 2022 tonnage of waste landfilled at the Site is based on personal communication with Darren Enevoldson, Environmental Technician and LFG Specialist at the City, on February 6, 2023 (Enevoldson 2022, pers. comm.). The assumed projected annual tonnage for years 2023 through 2027 are based on the Landfill Design and Operations Closure Plan (GHD 2018).

Table 1. Annual Quantity of Waste Disposed at the Site

Years	Waste Disposed (tonnes)	Cumulative Waste Disposed (tonnes)
1993	89,753	89,753
1994	84,272	174,025
1995	80,458	254,483
1996	80,794	335,277
1997	95,904	431,181
1998	83,756	514,937
1999	85,258	600,195
2000	89,547	689,742
2001	95,815	785,557
2002	102,522	888,079
2003	96,772	984,851
2004	106,483	1,091,334
2005	108,597	1,199,931
2006	116,218	1,316,149

Table 1. Annual Quantity of Waste Disposed at the Site

Years	Waste Disposed (tonnes)	Cumulative Waste Disposed (tonnes)
2007	102,688	1,418,837
2008	100,611	1,519,448
2009	114,590	1,634,038
2010	119,861	1,753,899
2011	106,387	1,860,286
2012	108,110	1,968,396
2013	108,917	2,077,313
2014	123,178	2,200,491
2015	136,115	2,336,606
2016	154,510	2,491,116
2017	151,456	2,642,572
2018	166,916	2,809,488
2019	156,566	2,966,054
2020	145,704	3,111,758
2021	154,079	3,265,836
2022	158,871	3,424,708
2023	155,000	3,579,708
2024	155,000	3,734,708
2025	155,000	3,889,708
2026	155,000	4,044,708
2027	155,000	4,199,708

4.2. Waste Characterization Categories

Characterization according to waste type is required to follow the BC MOECCS LFG Guideline. Waste must be characterized into three categories: relatively inert, moderately decomposable, and decomposable. The most recent available waste composition study, Regional District of Central Okanagan 2020-2021 Waste composition Study (Tetra Tech 2022) was used to determine the proportions of relatively inert, moderately decomposable, and decomposable waste materials for Year 2020 and onwards, while an earlier composition study, 2013 Waste Composition Study of Regional District of Central Okanagan (RDCO) (Morrison Hershfield Ltd. 2016), was used for Year 2019 and earlier.

The various waste streams, including tonnage and percentages of total waste buried at the Site in 2022, were provided by the City and are summarized in Table 2 (Enevoldson 2023, pers. comm.).

Table 2. 2022 Waste Stream Tonnage and Percentage of Total

Waste Stream	Tonnes	Percentage (%)
Residential (Cart) Garbage	44,175.13	27.81
Commercial (ICI) Garbage	45,520.93	28.65
C&D Debris	53,625.33	33.75
Contaminated Soil	10,137.43	6.38
Asbestos	757.24	0.48

Table 2. 2022 Waste Stream Tonnage and Percentage of Total

Waste Stream	Tonnes	Percentage (%)
Gypsum	3,072.22	1.93
Others	1,583.16	1.00
Total	158,871.44	100.00

Notes:

% = percent

C&D = construction and demolition

ICI = industrial, commercial, and institutional

Based on the newly available Regional District of Central Okanagan 2020-2021 Waste Composition Study (Tetra Tech 2021), the buried waste for 2022 at the Site are categorized as follows:

- Decomposable waste: 21.75 percent by weight of total waste buried
- Moderately decomposable waste: 42.49 percent by weight of total waste buried
- Relatively inert waste: 35.76 percent by weight of total waste buried

4.3. Waste Tonnage by Waste Characterization Category

Table 3 presents the historical and projected waste tonnages, as well as the waste characterization category, as described in previous sections.

Table 3. Waste Tonnage by Category

Years	Waste Disposed (tonnes)	Relatively Inert (tonnes)	Moderately Decomposable (tonnes)	Decomposable (tonnes)
1993	89,753	24,233	48,467	17,053
1994	174,025	22,753	45,507	16,012
1995	254,483	21,724	43,447	15,287
1996	335,277	21,814	43,629	15,351
1997	431,181	25,894	51,788	18,222
1998	514,937	22,614	45,228	15,914
1999	600,195	23,020	46,039	16,199
2000	689,742	24,178	48,355	17,014
2001	785,557	25,870	51,740	18,205
2002	888,079	27,681	55,362	19,479
2003	984,851	26,128	52,257	18,387
2004	1,091,334	28,750	57,501	20,232
2005	1,199,931	29,321	58,642	20,633
2006	1,316,149	31,379	62,758	22,081
2007	1,418,837	27,726	55,452	19,511
2008	1,519,448	27,165	54,330	19,116
2009	1,634,038	30,939	61,879	21,772
2010	1,753,899	32,362	64,725	22,774
2011	1,860,286	28,724	57,449	20,214
2012	1,968,396	29,190	58,379	20,541

Table 3. Waste Tonnage by Category

Years	Waste Disposed (tonnes)	Relatively Inert (tonnes)	Moderately Decomposable (tonnes)	Decomposable (tonnes)
2013	2,077,313	29,408	58,815	20,694
2014	2,200,491	33,258	66,516	23,404
2015	2,336,606	36,751	73,502	25,862
2016	2,491,116	41,718	83,435	29,357
2017	2,642,572	40,893	81,786	28,777
2018	2,809,488	45,067	90,135	31,714
2019	2,966,054	40,707	84,546	31,313
2020	3,111,758	48,126	66,802	30,776
2021	3,265,836	48,088	70,152	35,839
2022	3,424,708	56,812	67,504	34,555
2023	3,579,708	55,428	65,860	33,713
2024	3,734,708	55,428	65,860	33,713
2025	3,889,708	55,428	65,860	33,713
2026	4,044,708	55,428	65,860	33,713
2027	4,199,708	55,428	65,860	33,713

Note:

Waste Disposed data are from Table 1; other data are based on calculations. Tonnage of each category prior to 2020 is based on the 2019 Landfill Gas Collection Efficiency Study – Glenmore Landfill Site (CH2M 2020).

5. Landfill Gas Generation Model

Methane production at the Site was estimated using the Tool specified by the British Columbia Environmental Protection and Sustainability (BC EPS) for annual reporting. The model is based on a first-order kinetic decomposition rate equation for quantifying emissions from the decomposition of wastes in MSW landfills. Table 4 presents the parameters required to run the model.

Table 4. Input Parameters used in the Tool

Input Parameters or Constants	LFG Generation Model
	BC EPS LFG Guideline and Calculation Tool
First year of historical data used	1993
Year of Assessment	2023
Annual waste tonnage	Annual waste acceptance from 1993 to 2022 Annual waste tonnages for relatively inert, moderately decomposable, and decomposable wastes
k	Methane generation rate
Methane generation rates	For relatively inert, moderately decomposable, and decomposable wastes
Lo	Methane generation potential
Waste types	Relatively inert, moderately decomposable, and decomposable wastes

The following assumptions were used in the Tool:

- Lag time before start of gas production: 1 year
- Methane by volume: 50 percent

- Carbon dioxide by volume: 50 percent
- Methane density at 1 atmosphere (atm), 25 degrees Celsius (°C): 0.6557 kilogram per cubic metre (kg/m³)
- Carbon dioxide density, 25°C: 1.7988 kg/m³

5.1. Model Input Parameters Used and Justification

5.1.1. Climate Information

The average annual precipitation of the nearest meteorological station (Kelowna A #1123970, located at the Kelowna Airport) is 386.9 millimetres (mm) based on Canadian Climate Normals between 1981 and 2010 (Government of Canada 2022). For this Assessment, the average annual precipitation data from the Kelowna A station were used for calculation of the methane generation rate.

5.1.2. Methane Generation Rate

Input parameters used for the constant, k , are based on the BC MOECCS LFG Guideline, Table 5.2 (CRA 2009).

According to the annual precipitation of 386.9 mm, the model input k -values for this Site are as follows:

- 0.01 per year (y^{-1}) for relatively inert waste
- 0.02 y^{-1} for moderately decomposable waste
- 0.05 y^{-1} for decomposable waste

However, the National Inventory Report 1990-2017: Greenhouse Gas Sources and Sinks in Canada (NIR) (ECCC 2020) adopted a new methodology, which uses a new formula to calculate k -value from precipitation.

The k -value is calculated as follows:

$$k(y^{-1}) = 7 \times 10^{-5} \times precipitation(mm) - 0.0172 \quad (1)$$

With a precipitation of 386.9 mm, the calculated k value for Kelowna is 0.00988. Based on Table 5.2 of the BC MOECCS LFG Guidance, the new k -value for each category is proportionally calculated as follows:

- 0.00371 y^{-1} for relatively inert waste
- 0.00741 y^{-1} for moderately decomposable waste
- 0.01853 y^{-1} for decomposable waste

These new k values were used in this study.

According to the BC MOECCS LFG Guideline, Section 5.4, the selected k -value should be corrected based on the landfill's operations and maintenance practices, including stormwater management, cover properties, and the extent of leachate recirculation or stormwater injection. Based on Tables 5.3 and 5.4 of the BC MOECCS LFG Guideline, the water addition factor appropriate for the Site conditions in 2022 is 1.0. The reasons are as follows:

- There is partial infiltration of stormwater into the waste.

5.1.3. Methane Generation Potential (Lo)

The input parameters used for the Lo values are based on the BC MOECCS LFG Guideline, Table 5.1 (CRA 2009). For this Site, the model uses the following Lo values:

- 20 m³ of methane per metric tonne of waste for relatively inert waste
- 120 m³ of methane per metric tonne of waste for moderately decomposable waste
- 160 m³ of methane per metric tonne of waste for decomposable waste

6. Landfill Gas Model Results

This section presents the results of the 2022 landfill gas generation assessment in accordance with the latest available waste disposal data and future waste disposal projections for the Site. Table 5 presents the updated annual methane production using the Tool (Attachment 1).

Table 5. Annual Methane Production Using the BC MOECCS Calculation Tool for the Glenmore Landfill

Estimated Quantity of Methane Produced	Year	Tonnes Per Year
In the year preceding the Assessment	2022	1,962
In the year of the Assessment	2023	2,046
1 year after the Assessment	2024	2,126
2 years after the Assessment	2025	2,205
3 years after the Assessment	2026	2,283
4 years after the Assessment	2027	2,360

According to the Tool results, 1,962 tonnes of methane were generated in 2022, which corresponds to approximately a 341.5 cubic metres per hour (m³/h) or 201.0 standard cubic feet per minute (scfm) methane generation rate (at 25°C, 101.3 kilopascals [kPa]). Using a typical LFG composition of 50 percent methane and 50 percent carbon dioxide by volume, the LFG generation rate in 2022 is about 683 m³/h (402 scfm).

7. Landfill Gas System Efficiency

7.1. 2022 Landfill Gas Collection Data

In 2022, there were 1,131,908 m³ of LFG destroyed through flaring and 2,006,112 m³ of LFG was processed through the Fortis Biogas Plant for beneficial use by FortisBC (Hoekstra 2023, pers. comm.). This equates to a total of 3,138,020 m³ of LFG collected from the landfill.

7.2. 2021 Landfill Gas Collection Efficiency

In accordance with the BC MOECCS LFG Design Guidelines, collection efficiency (CE) is calculated based on the following equation:

$$CE = \left(\frac{Q_c}{Q_p} \right) \times 100\% \quad (2)$$

Where:

CE = Collection efficiency expressed as a percentage (%)

Q_c = Normalized average collected flow rate of LFG in the given calendar year (m^3/h)

Q_p = Estimated generated LFG flow rate in given calendar year (m^3/h), which is calculated by the Tool

The normalized average collected flow rate of LFG (Q_c) is calculated according to:

$$Q_c = Q_a \times \frac{C_m}{50\%} \quad (3)$$

Where:

Q_a = Average measured LFG flow rate (m^3/h)

C_m = Annual average methane concentration measured during LFG management system uptime at a central collection point near the blower or combustion and utilization device of the LFG management system expressed as a percentage (%)

The average measured LFG flow rate (Q_a) is measured according to the following:

$$Q_a = \frac{V_{LFG}}{(24 \times \text{number of days in that year})} \quad (4)$$

Where:

V_{LFG} = Total volume of LFG collected in the calendar year 2022 (cubic metres per year [m^3/y]); 2022 has 365 days

Based on this formula:

$$\begin{aligned} Q_a &= \frac{V_{LFG}}{(24 \times 365)} \\ Q_a &= \frac{3,138,020 \text{ m}^3}{(24 \text{ h/day} \times 365 \text{ days})} = 358.2 \text{ m}^3/\text{h} \\ Q_p &= 683.0 \text{ m}^3/\text{h} \text{ (from tool)} \end{aligned}$$

Based on record data:

$$\begin{aligned} C_m &= 59.7\% \text{ (Enevoldson 2023, pers. comm)} \\ Q_c &= Q_a \times \frac{C_m}{50\%} = 358.2 \text{ m}^3/\text{h} \times \frac{59.7\%}{50\%} = 427.7 \text{ m}^3/\text{h} \\ CE &= \left(\frac{Q_c}{Q_p} \right) \times 100\% = \left(\frac{427.7 \text{ m}^3/\text{h}}{683.0 \text{ m}^3/\text{h}} \right) \times 100\% = 62.6\% \end{aligned}$$

The final collection efficiency of the LFG collection system is estimated to be 63 percent.

8. Closure

The conclusions represent the best judgement of the assessor based on historical data, predicted waste disposal rates, and current models and guidelines.

Sincerely,

Jacobs Consultancy Canada Inc.



Emily Roney

Technical Support

Chuck Smith, P.Eng.

Senior Technical Consultant

PERMIT TO PRACTICE
JACOBS CONSULTANCY CANADA INC.
PERMIT #1003650
Engineers & Geoscientists BC

9. Limitations

The findings and conclusions of this TM are based on information provided by the City, which is assumed to be correct, and certain assumptions as outlined in this TM. Except as provided for in this TM, Jacobs has made no independent investigation as to the accuracy or completeness of the information obtained from the City or from other secondary sources during completion of this work. In some cases, however, information data gaps exist. The interpretation and findings of this TM were limited in these situations.

This TM was prepared using analyses and procedures consistent with generally accepted professional engineering consulting principles and practices. No other warranty, expressed or implied, is made. This TM is solely for the use and information of the City of Kelowna (our client) unless otherwise noted. Any reliance on this TM by a third party is at such party's sole risk.

Criteria contained herein apply to conditions existing when services were performed and are intended only for the purposes, locations, and project parameters indicated. Jacobs is not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services.

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Attachment 1

British Columbia Ministry of Environment and Protection and Sustainability's Methane Generation Estimation Tool - for Annual Reporting Results for the Glenmore Landfill Site

ATTACHMENT 1

<i>Step Number</i>	<i>Step</i>	<i>Guidance Document Chapter</i>
Step 1	Enter the calendar year of the Annual Report in sheet T1 cell B1.	Sections 7, 8
Step 2	Enter k value (after Water Addition Factor Correction) for Relatively Inert waste in sheet T2 column H.	Section 5
Step 3	Enter k value (after Water Addition Factor Correction) for Moderately Decomposable waste in sheet T2 cells Column I.	Section 5
Step 4	Enter k value (after Water Addition Factor Correction) for Decomposable waste in sheet T2 column J.	Section 5
Step 5	Enter historical annual mass of Relatively Inert waste received, in tonnes, from the year 1980 to the year preceding the Annual Report into sheet T2 column E (highlighted green). For years before landfill opening leave cells blank. Repeat this procedure for Moderately Decomposable and Decomposable wastes in sheet T2 Column F and Column G (highlighted green), respectively. Refer to Sections 4.1 and 5.1, for determination of historical annual mass of waste received.	Sections 4.1, 5.1
Step 6	Enter forecasted annual mass of Relatively Inert waste received, in tonnes, for the year of the Annual Report and for the four consecutive years immediately after the year of the Annual Report in sheet T2 Column E (highlighted orange). Repeat this procedure for Moderately Decomposable and Decomposable wastes in sheet T2 Column F and Column G (highlighted orange), respectively.	Section 4.2, 5.1
Step 7	Use the data from sheet T1 to complete the Annual Report and calculate the LFG management system collection efficiency.	Landfill Gas Management Facility Design Guidance

Year of Report	2023	
Annual Tonnage in Preceding Year	158,871	(tonnes/year)
Total waste in Place in the Preceding Year	3,424,708	(tonnes/year)
Methane generation in the Preceding Year	1,962	(tonnes CH ₄ /year)

Next Five Years	Waste Tonnage (tonnes)	Methane Generation (tonnes CH ₄ /year)
2023	155,000	2,046
2024	155,000	2,126
2025	155,000	2,205
2026	155,000	2,283
2027	155,000	2,360

	Relatively Inert	Moderately Decomposable	Decomposable	m ³ CH ₄ /tonne
Gas Production potential, Lo =	20	120	160	
lag time before start of gas production, lag =	1	years		
Historical Data Used (years)	30			
1st Year of Historical Data Used	1993			
4 Years after Reporting Year	2027			
methane (by volume)	50%			
carbon dioxide (by volume)	50%			
methane (density) - 1atm, 25C	0.6557	kg/m ³	(25C,SP)	
carbon dioxide (density)	1.7988	kg/m ³	(25C,SP)	

Year	Year Number	Annual Tonnage (tonnes)	Cumulative Waste-in-place (tonnes)	Waste Tonnage			Methane Generation Rate, k			Annual Methane Production (tonnes/yr)	Annual Landfill Gas Production (m ³ /hr)
				Relatively Inert (tonnes)	Moderately Decomposable (tonnes)	Decomposable (tonnes)	Relatively Inert (year ⁻¹)	Moderately Decomposable (year ⁻¹)	Decomposable (year ⁻¹)		
1993	1	89,753	89,753	24,233	48,467	17,053	0.0037	0.0074	0.0185	0.0	0.0
1994	2	84,272	174,025	22,753	45,507	16,012	0.0037	0.0074	0.0185	62.6	21.8
1995	3	80,458	254,483	21,724	43,447	15,287	0.0037	0.0074	0.0185	120.6	42.0
1996	4	80,794	335,277	21,814	43,629	15,351	0.0037	0.0074	0.0185	175.1	61.0
1997	5	95,904	431,181	25,894	51,788	18,222	0.0037	0.0074	0.0185	229.1	79.8
1998	6	83,756	514,937	22,614	45,228	15,914	0.0037	0.0074	0.0185	293.0	102.0
1999	7	85,258	600,195	23,020	46,039	16,199	0.0037	0.0074	0.0185	347.6	121.0
2000	8	89,547	689,742	24,178	48,355	17,014	0.0037	0.0074	0.0185	402.5	140.2
2001	9	95,815	785,557	25,870	51,740	18,205	0.0037	0.0074	0.0185	459.7	160.1
2002	10	102,522	888,079	27,681	55,362	19,479	0.0037	0.0074	0.0185	520.6	181.3
2003	11	96,772	984,851	26,128	52,257	18,387	0.0037	0.0074	0.0185	585.3	203.8
2004	12	106,483	1,091,334	28,750	57,501	20,232	0.0037	0.0074	0.0185	645.2	224.7
2005	13	108,597	1,199,931	29,321	58,642	20,633	0.0037	0.0074	0.0185	711.1	247.6
2006	14	116,218	1,316,149	31,379	62,758	22,081	0.0037	0.0074	0.0185	777.6	270.8
2007	15	102,688	1,418,837	27,726	55,452	19,511	0.0037	0.0074	0.0185	848.6	295.5
2008	16	100,611	1,519,448	27,165	54,330	19,116	0.0037	0.0074	0.0185	909.2	316.6
2009	17	114,590	1,634,038	30,939	61,879	21,772	0.0037	0.0074	0.0185	967.7	336.9
2010	18	119,861	1,753,899	32,362	64,725	22,774	0.0037	0.0074	0.0185	1,035.1	360.4
2011	19	106,387	1,860,286	28,724	57,449	20,214	0.0037	0.0074	0.0185	1,105.3	384.9
2012	20	108,110	1,968,396	29,190	58,379	20,541	0.0037	0.0074	0.0185	1,165.3	405.7
2013	21	108,917	2,077,313	29,408	58,815	20,694	0.0037	0.0074	0.0185	1,225.7	426.8
2014	22	123,178	2,200,491	33,258	66,516	23,404	0.0037	0.0074	0.0185	1,285.9	447.7
2015	23	136,115	2,336,606	36,751	73,502	25,862	0.0037	0.0074	0.0185	1,355.3	471.9
2016	24	154,510	2,491,116	41,718	83,435	29,357	0.0037	0.0074	0.0185	1,432.8	498.9
2017	25	151,456	2,642,572	40,893	81,786	28,777	0.0037	0.0074	0.0185	1,522.2	530.0
2018	26	166,916	2,809,488	45,067	90,135	31,714	0.0037	0.0074	0.0185	1,608.3	560.0
2019	27	156,566	2,966,054	40,707	84,546	31,313	0.0037	0.0074	0.0185	1,704.1	593.4
2020	28	145,704	3,111,758	48,126	66,802	30,776	0.0037	0.0074	0.0185	1,794.5	624.8
2021	29	154,079	3,265,836	48,088	70,152	35,839	0.0037	0.0074	0.0185	1,872.6	652.0

Year	Year Number	Annual Tonnage (tonnes)	Cumulative Waste-in-place (tonnes)	Waste Tonnage			Methane Generation Rate, k			Annual Methane Production (tonnes/yr)	Annual Landfill Gas Production (m ³ /hr)
				Relatively Inert (tonnes)	Moderately Decomposable (tonnes)	Decomposable (tonnes)	Relatively Inert (year ⁻¹)	Moderately Decomposable (year ⁻¹)	Decomposable (year ⁻¹)		
2022	30	158,871	3,424,708	56,812	67,504	34,555	0.0037	0.0074	0.0185	1,961.5	683.0
2023	31	155,000	3,579,708	55,428	65,860	33,713	0.0037	0.0074	0.0185	2,045.6	712.3
2024	32	155,000	3,734,708	55,428	65,860	33,713	0.0037	0.0074	0.0185	2,125.9	740.2
2025	33	155,000	3,889,708	55,428	65,860	33,713	0.0037	0.0074	0.0185	2,205.0	767.8
2026	34	155,000	4,044,708	55,428	65,860	33,713	0.0037	0.0074	0.0185	2,283.1	795.0
2027	35	155,000	4,199,708	55,428	65,860	33,713	0.0037	0.0074	0.0185	2,360.2	821.8

Appendix 4

GHD LFG-Mitigation-Assessment



Technical Memorandum

March 6th, 2023

Original: June 1, 2021
Revision 1: March 6, 2023

To: Scott Hoekstra

Ref. No.: 11225911

From: Deacon Liddy & Annalise Carreira

Tel: 604-248-3984

Subject: Landfill Gas Migration Assessment for the Glenmore Landfill – 2023 Update

1. Introduction

GHD Limited (GHD) was contracted by the City of Kelowna (City) to conduct a landfill gas (LFG) migration assessment for the Glenmore Landfill (Site or Landfill). The purpose of the LFG migration assessment is to identify potential off-Site receptors and assess the risk of LFG migration originating from the landfill. On-site receptors and associated LFG migration risks have been identified and reviewed by SLR (SLR, 2018).

In June 2021, GHD provided recommend locations for installation of additional soil gas monitoring probes and a soil gas monitoring program that specifies sampling locations, frequency and monitoring parameters.

This assessment has been updated to reflect the City's implementation of the recommended soil gas monitoring probes.

2. Background Review

LFG migration is dependent on numerous factors such as landfill cover, soil stratigraphy, and hydrogeologic setting. Given optimal site conditions, LFG can migrate significant distances from the limit of waste. The permeable nature of some of the overburden sand and gravel fill material surrounding the perimeter of the landfill may allow for lateral migration of LFG from the landfill. LFG migration potential will be dictated by whether or not the migration pathways within the overburden matrix are fully saturated or unsaturated. Fully saturated materials act as a barrier against gas migration through the overburden matrix. As a result, groundwater-surface water connectivity should be evaluated to assess the potential for LFG migration from the Landfill.

Sub-surface migration of LFG poses two primary concerns related to the accumulation of gases within or below structures near the landfill. First, accumulation of LFG in a subsurface structure (i.e., basement, buried manhole, etc.) may expose those required to enter the structure to an oxygen deficient environment. Second, accumulation of LFG introduces the risk of an explosion if a source of ignition is present. The risk of explosion occurs when the concentration of methane in air exceeds its Lower Explosive Limit (LEL). Because the LEL of methane is approximately 5 percent by volume in air, only a small proportion of LFG (containing approximately 50 percent methane by volume) is necessary to create explosive conditions.



The highest likelihood of LFG migration to outside the limit of waste occurs during the winter months when snow and ice can form an impermeable blanket across the ground surface. It is therefore recommended that the potential off-Site LFG migration be monitored at the periphery of the Site. The soil gas concentrations at the Site boundary must not exceed the lower explosive limit of methane (five percent by volume).

2.1 Regulatory Requirements

Landfill gas is regulated under the Landfill Gas Management Regulation (LFG Regulation), the Landfill Criteria for Municipal Solid Waste, second edition (Landfill Criteria), and the BC LFG Management Facilities Design Guidelines, all of which are issued by the BC Ministry of Environment and Climate Change (ENV).

Under the regulations, LFG monitoring is required to ensure the health and safety of the Site staff, users of the Site and the public. An LFG monitoring program should be developed and conducted in accordance with Section 8.0 of the BC LFG Management Facilities Design Guidelines (ENV, 2010) and Sections 4.2 and 9.3 of the Landfill Criteria.

LFG may migrate from the Landfill into the surrounding soil and create a potential hazard to personnel, the public and infrastructure. The release of LFG from the Landfill is regulated under the Landfill Criteria, which requires that soil gas concentrations at the Landfill site boundary must not exceed the lower explosive limit (LEL) of methane (five percent by volume) at any time.

2.2 Glenmore Landfill LFG

In the most recent Design, Operations, and Closure Plan (DOCP) (GHD, 2018), it was determined that the 2021 perimeter gas probe network did not surround the limit of waste and required expansion. As per Section 8.1 of the LFG Management Facilities Design Guidelines (MOE, 2010), LFG migration Assessment should be completed by a Qualified Professional to identify potential pathways of LFG migration to off-Site receptors prior to installing additional perimeter LFG probes.

3. Potential Soil Gas Migration Receptors

A desktop review of available geospatial information was completed to identify potential off-Site receptors such as houses, businesses, buildings, and parks within a 1-kilometre radius of the landfill OC boundary. Each of the potential off-Site receptors, or groups thereof, was assigned a numerical ID, and a determination was made regarding whether or not soil gas monitoring was warranted. The LFG migration pathway assessments were based on factors including the type of receptor, its proximity to the limit of waste, physical features such as roads and utility trenches which may act as conduits, and physical features such as surface water bodies and ridges which might act as barriers to LFG migration.

Fifteen potential off-Site receptors or groups of receptors for LFG migration were identified as presented on Figure 1. The LFG migration pathway assessment for each receptor is presented in Table 3.1 below.



Table 3.1 Potential LFG Receptors Within 1 km of OC Boundary

Receptor ID	Receptor Description	LFG Migration Pathway Assessment	Monitoring Recommended
1	North Glenmore Dog Park	The North Glenmore Dog Park is located approximately 200 m west of the limit of waste and 20 to 150 m from the OC boundary, and is separated from the landfill by Glenmore Road N. A possible pathway for LFG migration may exist between the landfill and the park and should be monitored.	Yes
2	Houses (approx. 7) NW of landfill	The houses and structures are located approximately 330 to 850 m northwest of the limit of waste and 110 to 500 m from the OC boundary. The houses are separated from the landfill by agricultural lands and Glenmore Rd N. A possible pathway for LFG migration may exist between the landfill and the houses and should be monitored.	Yes
3	House and garage N of landfill	The house and garage are located approximately 500 m north of the limit of waste and 210 m from the OC boundary, and are separated from the landfill by an agricultural field and a small forested area. A possible pathway for LFG migration may exist between the landfill and the house and should be monitored.	Yes
4	Quail Ridge subdivision houses (many)	The housing subdivision is located approximately 300 to 1000 m west and northwest of the limit of waste and 0 to 450 m from the OC boundary. The subdivision is separated from the landfill by a pond, the two ridges on the landfill's eastern perimeter, and by the western slope of Quail Ridge. The ridges and pond are not continuous and therefore do not necessarily constitute a complete barrier for LFG migration. A possible pathway may therefore exist for LFG migration between the landfill and the Quail Ridge subdivision and should be monitored.	Yes
5	The Okanagan Golf Club	The golf course is located to the east of the landfill and is approximately 250 m from the limit of waste at its closest and 0 to 1000 m from the OC boundary. The golf course is separated from the landfill by the pond, the ridges, and partially by Quail Ridge. The ridges and pond are not continuous and therefore do not necessarily constitute a complete barrier. A possible pathway for LFG migration may exist between the landfill and the golf course and should be monitored.	Yes
6	Hotels (Borgata Lodge and Pinnacle Pointe Resort)	The hotels are located approximately 900 m east of the limit of waste and 500 to 700 m from the OC boundary, and are separated from the landfill by the ridges, the pond, Quail Ridge, and Country Club Rd.	No



Table 3.1 Potential LFG Receptors Within 1 km of OC Boundary

Receptor ID	Receptor Description	LFG Migration Pathway Assessment	Monitoring Recommended
		No pathway exists for LFG migration between the landfill and the hotels.	
7	Small building located near the Pine Trail Lookout.	The building is located approximately 900 m southeast of the limit of waste and 250 m from the OC boundary, and is separated from the landfill by the slough and a portion of the golf course and is located at the top of a hill. A possible pathway for LFG migration may exist between the landfill and the building during the winter when the slough is covered with ice and should be monitored.	Yes
8	UBC Okanagan Residence buildings	The residence buildings are located approximately 1200 m southeast of the limit of waste and 850 to 1000 m from the OC boundary, and are separated from the landfill by the slough and agricultural lands. A possible pathway for LFG migration may exist between the landfill and the residence buildings in the winter when the slough is covered with ice and should be monitored.	Yes
9	Three houses West of UBCO	The houses are located approximately 1300 m southeast of the limit of waste and 1000 m from the OC boundary, and are separated from the landfill by the slough, and agricultural lands. A possible pathway for LFG migration may exist between the landfill and the houses when the slough is covered with ice and should be monitored.	Yes
10	Small building located at the SW corner of Tutt Farm	The building is located approximately 550 m southwest of the limit of waste and 250 m from the OC boundary, and is separated from the landfill by the slough and agricultural lands. A possible pathway for LFG migration may exist between the landfill and the building and should be monitored.	Yes
11	Low rise condo buildings at Glenmore Rd. N and John Hindle Dr.	The condo buildings are located approximately 650 m southwest from the limit of waste and 300 m from the OC boundary, and are separated from the landfill by Tutt Pond, agricultural lands, and John Hindle Dr. A possible pathway for LFG migration may exist between the landfill and the condo buildings and should be monitored.	Yes
12	Shady Lane RV and Trailer Park on Glenmore Rd at John Hindle Dr.	The trailer park is located approximately 650 m southwest of the limit of waste and 400 m from the OC boundary, and is separated from the landfill by Tutt Pond, agricultural lands, Glenmore Rd, and John Hindle Dr. A possible pathway for LFG migration may exist between the landfill and the trailer park and should be monitored.	Yes



Table 3.1 Potential LFG Receptors Within 1 km of OC Boundary

Receptor ID	Receptor Description	LFG Migration Pathway Assessment	Monitoring Recommended
13	Two houses located south of John Hindle Dr.	The houses are located approximately 600 to 700 m south of the limit of waste and 250 m from the OC boundary, and are separated from the landfill by the slough and John Hindle Dr. and are located on a hill. No pathway exists for LFG migration between the landfill and the houses.	No
14	Houses and businesses on Glenmore Rd N, south of John Hindle Dr.	The houses and businesses are located between 550 and 1000+ m southwest of the limit of waste and 300 to 1000 m from the OC boundary, and are separated from the landfill by the slough, John Hindle Dr., the ridge located south of John Hindle Dr., and by Glenmore Rd N. No pathway exists for LFG migration exists between the landfill and the houses and businesses.	No
15	3-6 houses E of Glenmore Rd N	The houses are located approximately 500 m west of the limit of waste and 300 to 400 m from the OC boundary, and are separated from the landfill by Bredin pond and Glenmore Trail N. A possible pathway for LFG migration may exist between the landfill and the houses and should be monitored.	Yes

4. Soil Gas Monitoring Locations Proposed in 2021

Of the fifteen potential off-Site receptors assessed, it was determined that potential pathways for LFG migration may exist between the landfill and twelve of them (Figure 1). The off-Site receptors identified as having possible pathways for LFG migration are located around the perimeter of the landfill. As such, the City expanded the soil gas monitoring probe network to fully surround the perimeter of the landfill.

In 2021, the landfill employed a network of five subsurface perimeter soil gas monitoring probes GL-GP-1, GL-GP-2, GL-GP-3, GL-GP-4, and GL-GP-5 which are located near Bredin Pond adjacent to the western property boundary of the Site. Based on the assessment in Section 3.0, eleven additional monitoring locations were added in 2022. Figure 1 presents the approximate locations of all soil gas monitoring probes installed.

5. Soil Gas Monitoring Program

The objective of the soil gas monitoring program is to monitor the concentrations of landfill gas in soil around the landfill site perimeter to identify, if any, the extent, magnitude, and temporal trends of LFG migration off-Site from the landfill. If methane is detected in the probes above the trigger level of 2.5 percent (50 percent of the lower explosive limit) then the locations and frequency should be re-assessed.



Soil gas probes GL-GP-2, GL-GP-3, and GL-GP-4 will remain in the monitoring program until the year 2025 to establish baseline measurements throughout the monitoring system. After this point, the three soil gas probes will be decommissioned, as recommended by GHD in 2021 as the close spacing of these probes makes them redundant.

5.1 Monitoring Procedure and Equipment

Soil gas monitoring should be conducted in accordance with the BC Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples (BC MOE, 2013).

Soil gas monitoring is conducted in the field, with the following parameters measured:

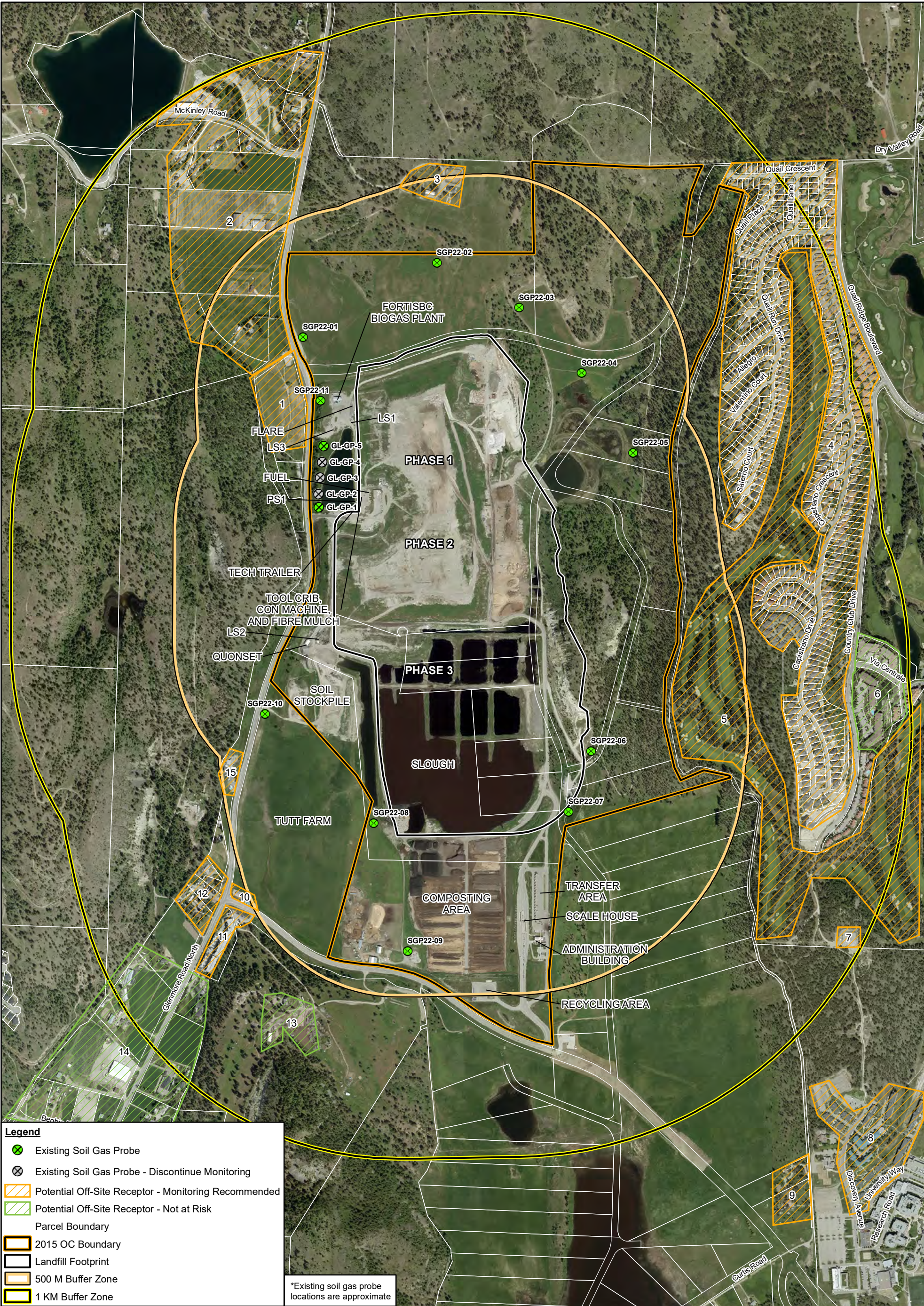
- Pressure
- Methane
- Carbon dioxide
- Oxygen

Prior to collecting soil gas measurements, the probes should be inspected for damage or potential concerns that could affect measurement integrity. The soil gas monitoring equipment (soil gas monitor) is then turned on and allowed to acclimatize. Next a pressure test is completed at each probe by connecting the positive lead of a digital manometer to the probe intake. The valve is opened, and the manometer reading is recorded. Following the pressure test, soil gases are purged by connecting the soil gas monitor hose to the probe. Soil gas is purged for 15-minutes (or the equivalent of 3 well diameters) and gas parameters/concentrations (i.e., methane, carbon dioxide, and oxygen) are recorded at 5-minute intervals during the purging. After purging, the final soil gas concentrations are recorded once stabilized. Following the collection of soil gas measurements, the depth to water in the probe should be recorded using a water level meter from the top of casing where the probes are in locations that may intercept the groundwater table. Additional observations of barometric pressure, air temperature, and physical conditions such as frost should be recorded for each location. The soil gas monitor is then fully purged with fresh air prior to collecting gas measurements at the next soil gas monitoring location.

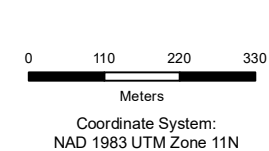
5.2 Monitoring Frequency

It is recommended that perimeter soil gas monitoring be carried out quarterly in conjunction with the regularly scheduled EMP.

Figures



Source: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation. B.C. Ministry of Environment, and B.C. Ministry of Forests, Lands and Natural Resource Operations (2016-17).
Aerial: City of Kelowna Orthophotos, May 21, 2017



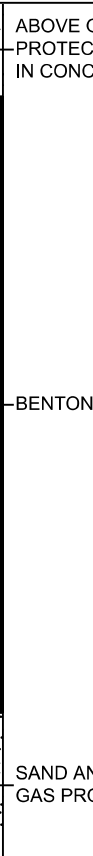
LANDFILL GAS MITIGATION ASSESSMENT FOR OFF-SITE RECEPTORS
CITY OF KELOWNA

ASSESSMENT OF OFF-SITE RECEPTORS

11225911
Mar 3, 2023

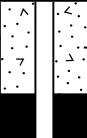
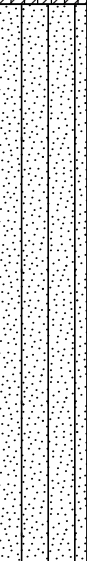
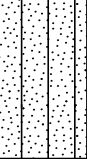
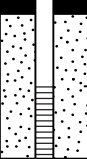
FIGURE 1

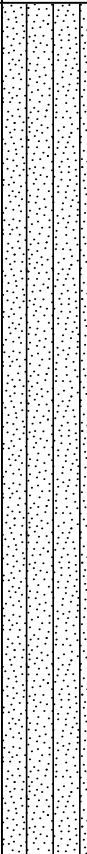
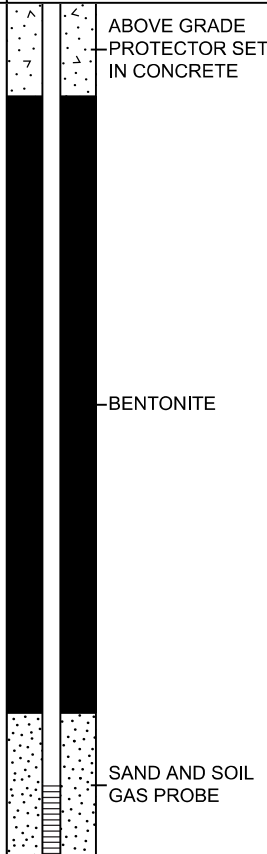
RECORD OF BOREHOLE LOG SGP22-01

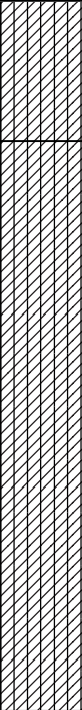
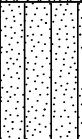
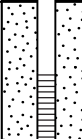
PROJECT NUMBER 2022-056			DRILLING DATE October 18, 2022			COORDINATES		
PROJECT NAME Glenmore Landfill			TOTAL DEPTH 1.8 m			COORD SYS		
CLIENT City of Kelowna			BORE DIAMETER 0.15 m			DATUM Local		
ADDRESS 2720 John Hindle Drive, Kelowna, BC			DRILLING METHOD Solid Stem Auger			DRILL RIG VWD Track Mount LAD 4500		
						CONTRACTOR Valley Wide Drilling		
COMMENTS						LOGGED BY GCS		
						CHECKED BY AR		
Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-01	Probe Diagram	Depth (m)	
SA1	AS	0.2		(ML) - CLAYEY SILT; some sand to sandy; brown; containing roots; cohesive; w>PL			0.2	
		0.4		(CL/ML) SILTY CLAY and CLAYEY SILT; some light brown silt and fine sand lenses; brown; cohesive; w~PL			0.4	
		0.6					0.6	
		0.8					0.8	
		1					1	
		1.2					1.2	
		1.4					1.4	
SA2	AS	1.6					1.6	
		1.8					1.8	
				END OF BOREHOLE				
		2					2	
		2.2					2.2	
		2.4					2.4	
		2.6					2.6	
		2.8					2.8	

PROJECT NUMBER 2022-056	DRILLING DATE October 18, 2022	COORDINATES
PROJECT NAME Glenmore Landfill	TOTAL DEPTH 1.8 m	COORD SYS
CLIENT City of Kelowna	BORE DIAMETER 0.15 m	DATUM Local
ADDRESS 2720 John Hindle Drive, Kelowna, BC	DRILLING METHOD Solid Stem Auger	DRILL RIG VWD Track Mount LAD 4500
		CONTRACTOR Valley Wide Drilling

COMMENTS	LOGGED BY GCS
	CHECKED BY AR

Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-02 Probe Diagram	Depth (m)
SA1	AS	0.2		(ML) - CLAYEY SILT; trace sand and gravel; grey-brown; cohesive; w<PL		0.2
		0.4		(SM) SILTY SAND; trace gravel, grey-brown, non-cohesive; moist		0.4
		0.6				0.6
		0.8				0.8
		1				1
		1.2				1.2
		1.4				1.4
SA2	AS	1.6				1.6
		1.8				1.8
				END OF BOREHOLE		
		2				2
		2.2				2.2
		2.4				2.4
		2.6				2.6
		2.8				2.8

PROJECT NUMBER 2022-056		DRILLING DATE October 18, 2022		COORDINATES		
PROJECT NAME Glenmore Landfill		TOTAL DEPTH 1.8 m		COORD SYS		
CLIENT City of Kelowna		BORE DIAMETER 0.15 m		DATUM Local		
ADDRESS 2720 John Hindle Drive, Kelowna, BC		DRILLING METHOD Solid Stem Auger		DRILL RIG VWD Track Mount LAD 4500		
				CONTRACTOR Valley Wide Drilling		
COMMENTS				LOGGED BY GCS		
				CHECKED BY AR		
Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-03 Probe Diagram	Depth (m)
SA1	AS	0.2		(SM) - SILTY SAND; trace gravel; grey; non-cohesive; moist		0.2
		0.4				0.4
		0.6				0.6
		0.8				0.8
		1				1
		1.2	1.2			
		1.4	1.4			
SA2	AS	1.6				1.6
		1.8				1.8
		2		END OF BOREHOLE		2
		2.2				2.2
		2.4				2.4
		2.6				2.6
		2.8				2.8

PROJECT NUMBER 2022-056			DRILLING DATE October 18, 2022			COORDINATES		
PROJECT NAME Glenmore Landfill			TOTAL DEPTH 1.8 m			COORD SYS		
CLIENT City of Kelowna			BORE DIAMETER 0.15 m			DATUM Local		
ADDRESS 2720 John Hindle Drive, Kelowna, BC			DRILLING METHOD Solid Stem Auger			DRILL RIG VWD Track Mount LAD 4500		
						CONTRACTOR Valley Wide Drilling		
COMMENTS						LOGGED BY GCS		
						CHECKED BY AR		
Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-04	Probe Diagram	Depth (m)	
SA1	AS	0.2		(ML) - CLAYEY SILT; brownish-grey; containing roots; cohesive; w<PL		ABOVE GRADE PROTECTOR SET IN CONCRETE BENTONITE	0.2	
		0.4		(CL) - SILTY CLAY; brownish-grey; cohesive; w~PL			0.4	
SA2	AS	0.6					0.6	
		0.8					0.8	
		1					1	
		1.2					1.2	
		1.4					1.4	
SA3	AS	1.6		(SM) - SILTY SAND; trace gravel, brown; non-cohesive; moist		SAND AND SOIL GAS PROBE	1.6	
		1.8					1.8	
		2		END OF BOREHOLE			2	
		2.2					2.2	
		2.4					2.4	
		2.6					2.6	
		2.8					2.8	

PROJECT NUMBER 2022-056	DRILLING DATE October 18, 2022	COORDINATES
PROJECT NAME Glenmore Landfill	TOTAL DEPTH 1.8 m	COORD SYS
CLIENT City of Kelowna	BORE DIAMETER 0.15 m	DATUM Local
ADDRESS 2720 John Hindle Drive, Kelowna, BC	DRILLING METHOD Solid Stem Auger	DRILL RIG VWD Track Mount LAD 4500
		CONTRACTOR Valley Wide Drilling

COMMENTS	LOGGED BY GCS
	CHECKED BY AR

Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SPG22-05 Probe Diagram	Depth (m)
SA1	AS	0.2		(ML) - CLAYEY SILT; grey; containing roots; cohesive; w<PL	ABOVE GRADE PROTECTOR SET IN CONCRETE	0.2
		0.4		(CL) - SILTY CLAY; dark grey with white; cohesive; w~PL		0.4
		0.6				0.6
SA2	AS	0.8			BENTONITE	0.8
		1				1
		1.2				1.2
		1.4				1.4
SA3	AS	1.6		(CH) - CLAY; dark grey with white bands; brown stains; cohesive; stiff; w>PL	SAND AND SOIL GAS PROBE	1.6
		1.8		END OF BOREHOLE		1.8
		2				2
		2.2				2.2
		2.4				2.4
		2.6				2.6
		2.8				2.8

PROJECT NUMBER 2022-056	DRILLING DATE October 19, 2022	COORDINATES
PROJECT NAME Glenmore Landfill	TOTAL DEPTH 1.8 m	COORD SYS
CLIENT City of Kelowna	BORE DIAMETER 0.15 m	DATUM Local
ADDRESS 2720 John Hindle Drive, Kelowna, BC	DRILLING METHOD Solid Stem Auger	DRILL RIG VWD Track Mount LAD 4500
		CONTRACTOR Valley Wide Drilling

COMMENTS	LOGGED BY GCS
	CHECKED BY AR

Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-06 Probe Diagram	Depth (m)
SA1	AS	0.2		(ML) - CLAYEY SILT; trace gravel; grey with white; cohesive; w<PL		0.2
		0.4				0.4
		0.6				0.6
		0.8				0.8
		1				1
		1.2			1.2	
		1.4		(ML) - CLAYEY SILT, some sand; grey; cohesive; w<PL		1.4
SA2	AS	1.6				1.6
		1.8				1.8
		2		END OF BOREHOLE		2
		2.2				2.2
		2.4				2.4
		2.6				2.6
		2.8				2.8

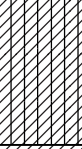
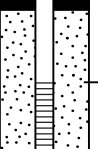
PROJECT NUMBER 2022-056	DRILLING DATE October 19, 2022	COORDINATES
PROJECT NAME Glenmore Landfill	TOTAL DEPTH 1.8 m	COORD SYS
CLIENT City of Kelowna	BORE DIAMETER 0.15 m	DATUM Local
ADDRESS 2720 John Hindle Drive, Kelowna, BC	DRILLING METHOD Solid Stem Auger	DRILL RIG VWD Track Mount LAD 4500
		CONTRACTOR Valley Wide Drilling

COMMENTS	LOGGED BY GCS
	CHECKED BY AR

Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-07 Probe Diagram	Depth (m)
SA1	AS	0.2		(ML) - CLAYEY SILT; some gravel; grey; cohesive; w<PL		0.2
		0.4				0.4
		0.6				0.6
		0.8				0.8
		1.0		(ML) - CLAYEY SILT; some sand and gravel; grey; cohesive; w<PL		1.0
		1.2				1.2
		1.4				1.4
		1.6				1.6
SA2	AS	1.8		END OF BOREHOLE		1.8
		2.0				2.0
		2.2				2.2
		2.4				2.4
		2.6				2.6
		2.8				2.8

PROJECT NUMBER 2022-056	DRILLING DATE October 19, 2022	COORDINATES
PROJECT NAME Glenmore Landfill	TOTAL DEPTH 1.8 m	COORD SYS
CLIENT City of Kelowna	BORE DIAMETER 0.15 m	DATUM Local
ADDRESS 2720 John Hindle Drive, Kelowna, BC	DRILLING METHOD Solid Stem Auger	DRILL RIG VWD Track Mount LAD 4500
		CONTRACTOR Valley Wide Drilling

COMMENTS	LOGGED BY GCS
	CHECKED BY AR

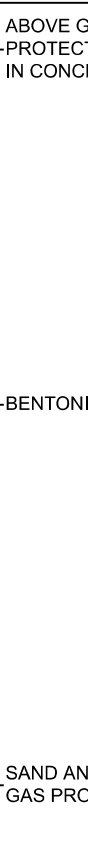
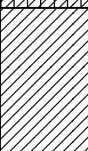
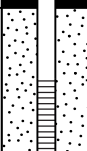
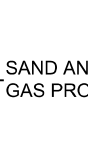
Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-08 Probe Diagram	Depth (m)
SA1	AS	0.2		(ML) - CLAYEY SILT; trace gravel; grey with white; cohesive; w<PL		0.2
		0.4				0.4
		0.6				0.6
		0.8				0.8
SA2	AS	1		(CL) - SILTY CLAY; dark grey with white; cohesive; w>PL		1
		1.2				1.2
		1.4		(CH) - CLAY; blackish-grey with white and brown; cohesive; w>PL		1.4
		1.6				1.6
SA3	AS	1.8				1.8
		2		END OF BOREHOLE		2
		2.2				2.2
		2.4				2.4
		2.6				2.6
		2.8				2.8

RECORD OF BOREHOLE LOG SGP22-09

PROJECT NUMBER 2022-056	DRILLING DATE October 19, 2022	COORDINATES
PROJECT NAME Glenmore Landfill	TOTAL DEPTH 1.8 m	COORD SYS
CLIENT City of Kelowna	BORE DIAMETER 0.15 m	DATUM Local
ADDRESS 2720 John Hindle Drive, Kelowna, BC	DRILLING METHOD Solid Stem Auger	DRILL RIG VWD Track Mount LAD 4500
		CONTRACTOR Valley Wide Drilling

COMMENTS	LOGGED BY GCS
	CHECKED BY AR

Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-09 Probe Diagram	Depth (m)
SA1	AS	0.2		(ML) - CLAYEY SILT; trace gravel; grey with white; cohesive; w<PL		0.2
		0.4				0.4
		0.6				0.6
		0.8				0.8
		1				1
SA2	AS	1.2		(CL) - SILTY CLAY; dark grey with white and brown stain; cohesive; stiff; w>PL		1.2
		1.4				1.4
SA3	AS	1.6		(ML) - CLAYEY SILT; some gravel; grey with white; cohesive; w>PL		1.6
		1.8				1.8
		2		END OF BOREHOLE		2
		2.2				2.2
		2.4				2.4
		2.6				2.6
		2.8				2.8

PROJECT NUMBER 2022-056			DRILLING DATE November 07, 2022			COORDINATES		
PROJECT NAME Glenmore Landfill			TOTAL DEPTH 1.8 m			COORD SYS		
CLIENT City of Kelowna			BORE DIAMETER 0.15 m			DATUM Local		
ADDRESS 2720 John Hindle Drive, Kelowna, BC			DRILLING METHOD Solid Stem Auger			DRILL RIG VWD Track Mount LAD 4500		
						CONTRACTOR Valley Wide Drilling		
COMMENTS						LOGGED BY GCS		
						CHECKED BY AR		
Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-10	Probe Diagram	Depth (m)	
SA1	AS	0.2		(ML) - CLAYEY SILT; brown; containing roots; cohesive; w>PL			0.2	
		0.4					0.4	
		0.6					0.6	
		0.8					0.8	
		1					1	
		1.2					1.2	
		1.4					1.4	
SA2	AS	1.6		(CH) - CLAY; brown, cohesive; w>PL			1.6	
		1.8					1.8	
		2		END OF BOREHOLE			2	
		2.2					2.2	
		2.4					2.4	
		2.6					2.6	
		2.8					2.8	

PROJECT NUMBER 2022-056	DRILLING DATE November 07, 2022	COORDINATES
PROJECT NAME Glenmore Landfill	TOTAL DEPTH 1.8 m	COORD SYS
CLIENT City of Kelowna	BORE DIAMETER 0.15 m	DATUM Local
ADDRESS 2720 John Hindle Drive, Kelowna, BC	DRILLING METHOD Solid Stem Auger	DRILL RIG VWD Track Mount LAD 4500
		CONTRACTOR Valley Wide Drilling

COMMENTS	LOGGED BY GCS
	CHECKED BY AR

Samples	Sample Type	Depth (m)	Graphic Log	Material Description	SGP22-11 Probe Diagram	Depth (m)
SA1	AS	0.2		(CL) - SILTY CLAY; some gravels; brown; cohesive; w>PL	ABOVE GRADE PROTECTOR SET IN CONCRETE	0.2
		0.4		(CL) - SILTY CLAY; brown with white; cohesive; w<PL		0.4
		0.6				0.6
		0.8				0.8
		1			BENTONITE	1
		1.2				1.2
		1.4				1.4
SA2	AS	1.6			SAND AND SOIL GAS PROBE	1.6
		1.8		END OF BOREHOLE		1.8
		2				2
		2.2				2.2
		2.4				2.4
		2.6				2.6
		2.8				2.8

Appendix 5

2022 Glenmore Landfill Water Quality Final Report March 24, 2023

FINAL REPORT

2022 ANNUAL WATER MONITORING REPORT FOR GLENMORE LANDFILL

**Operations Certificate MR 12218 EMS
Reference # E104956**



Prepared for:
City of Kelowna
Glenmore Landfill
2720 John Hindle Drive
Kelowna, BC
V1Y 2C5

Distribution:
1 Copy City of Kelowna
1 E-Copy: Keltech Environmental Ltd.

Report Number: 2022-059
March 24, 2023

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LIST OF ACRONYMS

AW	Aquatic life water use (freshwater)
BCWQG	BC Water Quality Guidelines
CoK	City of Kelowna
CSR	Contaminated Sites Regulation (BC)
DOCP	Design Operations and Closure Plan
DW	Drinking water use
ENV	Ministry of Environment and Climate Change Strategy
EPHw10-19	Extractable Petroleum Hydrocarbons (nC10-nC19) in water
EPHw19-32	Extractable Petroleum Hydrocarbons (nC19-nC32) in water,
GCDWQ	Guidelines for Canadian Drinking Water Quality
HEPHw	Heavy Extractable Petroleum Hydrocarbons in water
IW	Irrigation water use
LEPHw	Light Extractable Petroleum Hydrocarbons in water
QA/QC	Quality Assurance/Quality Compliance
RDCO	Regional District of Central Okanagan
TDS	Total Dissolved Solids
TG15	CSR Technical Guidance Document 15 (BC)
UBC	University of British Columbia
VOA	Volatile Organic Acids
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons

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R01	AR	NF	March 24, 2023	Client review comments addressed

1.0 INTRODUCTION

Keltech Environmental Ltd. (Keltech) was retained by City of Kelowna (CoK) to complete the 2022 Annual Water Monitoring Report for the CoK's Glenmore Landfill located at 2720 John Hindle Drive, Kelowna, BC. (the Site) Refer to appended Figure 1 – Site Location Map.

As requested by the CoK, Keltech has prepared this annual report summarizing the results of the 2022 annual environmental water quality monitoring program conducted by the CoK at the Site. This report is intended to satisfy the requirements of the current Glenmore Landfill Operational Certificate 12218 (OC) and Design Operations and Closure Plan (DOCP).

2.0 SITE DESCRIPTION

The Glenmore Landfill has been in operation since 1966, and it provides services to communities within the Regional District of Central Okanagan (RDCO) and Big White (Regional District of Kootenay Boundary, RDKB) as a multi-purpose waste management facility for non-hazardous municipal, commercial, institutional, and light industrial solid waste.

The extent of the landfill area for the annual water monitoring program includes:

- Four main operational areas identified as Phase 1, Phase 2, Phase 3, and Compost Facility (see Figure 2)
- A leachate collection system (see Leachate Management System in Appendix A)
- Four on-Site surface water bodies (Northeast Pond, Bredin Pond, Tutt Pond, and Slough)
- Four off-Site surface water bodies (Bubna Slough and Slough #2 located upgradient to the north, and Little Robert Lake and Robert Lake located downgradient to the south).
- On Site monitoring wells and surface water and leachate sample locations
- Four series of monitoring wells located outside the boundaries of the Site identified as:
 - the GL41 well series (three wells) located to the north of the landfill,
 - the GL15 well series (two wells) located to the southwest,
 - the GL28 well series (three wells) located to the south, and
 - 06BH-02 and the 09BH well series (seven wells) located east, south and southeast of the Site. Three of these seven, wells 09BH03, 09BH04, and 09BH07 are owned by the University of British Columbia (UBC).

The detailed well construction and status for each monitoring well installed on and off the Site can be found in Table 1, attached.

Two BC classified aquifers numbered 469 and 470 are identified as underlying the Site. Aquifer 469 is an overburden aquifer composed of sands and gravels with moderate productivity, low vulnerability, and low demand. Aquifer 470 is a bedrock aquifer composed of volcanic rocks likely belonging to the Penticton Group or Harper Ranch Group.

3.0 2022 ANNUAL WATER QUALITY MONITORING PROGRAM

The 2022 annual water quality program followed the recommendations of the *2021 Glenmore Landfill Annual Water Quality Report*, dated March 25, 2021, and consisted of manual monitoring of 58 monitoring wells for water levels and 29 monitoring wells for water quality, plus monitoring of four surface water bodies for water elevations and eight surface water bodies for water quality.

Water at select locations (Figure 2) was monitored and sampled for select water quality criteria and analyzed for select parameters as described in the methodology section. The program is summarized by sample point and analytical parameter in Tables A, B and C below. Note that the semi-annual spring and fall groundwater sampling occurred at generally the same time as the spring and fall surface water and leachate sampling events.

The following change was made to the monitoring and sampling program for 2022.

- Volatile Organic Acids (e.g., Resin and Fatty Acids) continue to be included in the leachate list of parameters to determine leachate system efficiency (i.e., buffering capacity). The inclusion of Volatile Organic Acids continued in 2022. These compounds do not have applicable water quality standards/guidelines.

Groundwater monitoring wells were monitored and sampled semi-annually as noted in Table A below.

Table A: Summary of 2022 Groundwater Sampling – Semi-Annual

Monitoring Well Location	Monitoring Well ID	Field Parameters	Analytical Parameters
Spring Sampling Event (May/June 2022)			
North border	GL41-1, GL41-2, GL41-3	Depth to water, pH, conductivity, redox, dissolved oxygen, and temperature	Dissolved metals, pH, alkalinity, hardness, chemical oxygen demand, dissolved organic carbon, total dissolved solids, chloride, fluoride, sulphate, and nutrients (ammonia, nitrate, nitrite, orthophosphate).
Northeast of Phase 1	GL23-1, GL4-1, GL4-2		
Phase 2	GL2-1, GL2-2, GL5-2		
West of Site	-		
Phase 3	GL35-3, GL20-1		
South	GL12-1, GL16-1, GL17-1, GL27-1, GL27-3, GL29-1, GL29-2		
Southern border/Off-Site	GL28-1, GL28-2, GL28-3, 09BH06-D, 09BH03, GL42-1, GL42-2, GL39-1, GL39-2		
Fall Sampling Event – September/October 2022			
North border	GL41-1, GL41-2, GL41-3	Depth to water, pH, conductivity redox, dissolved oxygen, and temperature	Dissolved metals, pH, alkalinity, hardness, chemical oxygen demand, dissolved organic carbon, total dissolved solids, chloride, fluoride, sulphate, and nutrients (ammonia, nitrate, nitrite, orthophosphate).
Northeast of Phase 1	GL4-1, GL4-2		
Phase 2	GL2-1, GL2-2		
West of Site	GL15-1, GL15-2		
Phase 3	GL20-1		
South	GL12-1, GL27-1, GL17-1, GL29-1, GL29-2		

Monitoring Well Location	Monitoring Well ID	Field Parameters	Analytical Parameters
Southern border/Off-Site	GL28-1, GL28-2, GL28-3, GL39-1, GL39-2		

Note: Wells in [Light blue text](#) means sampled in that season only.

Surface water samples were collected quarterly from the eight surface water bodies both on and off-Site as summarized in Table B below.

Table B: Summary of 2022 Surface Water Sampling – Quarterly

Surface Water Location	Sample ID	Field and Analytical Parameters
Sampled: March, June, September, and October 2022		
East of Phases 1 & 2	Northeast Pond	Field parameters: pH, conductivity, redox potential, total dissolved solids, dissolved oxygen, and temperature. Analytical parameters: Total metals, pH, conductivity, alkalinity, hardness, chemical oxygen demand, total organic carbon, total dissolved solids, chloride, fluoride, sulphate, and nutrients (ammonia, nitrate, nitrite, orthophosphate), fecal and total coliforms.
Centre of Site	Tutt Pond and Slough	
West of Phases 1 & 2	Bredin Pond	
Phase 3	Slough	
Background	Bubna Slough	
	Slough #2	
	Little Robert Lake	
	Robert Lake	

Leachate samples were collected quarterly from the on-Site leachate collection manholes as summarized in Table C below.

Table C: Summary of 2022 Leachate Sampling – Quarterly

Leachate Sample Location	Sample ID	Analytical Parameters
West side of Phase 1	N Pumphouse MH (Sampled: February, June, September, and October 2022)	Dissolved metals, pH, alkalinity, hardness, chemical oxygen demand, dissolved organic carbon, total dissolved solids, chloride, fluoride, sulphate, hydrogen sulfide, nutrients (ammonia, nitrate, nitrite, orthophosphate, phosphorous), LEPHw/HEPHw, VOC, VPH and Volatile Organic Acids (VOA).
	P1 Leachate MH-2 (Sampled: February, June, September, and October 2022)	
Area 2	P2 A2 Leachate MH (Sampled: February, June, September, and October 2022)	
Southwest corner of Phase 2	S Leachate Wet Well (Sampled: February, June, September, and October 2022)	

4.0 2022 ADDITIONAL SITE WORKS – BY CITY OF KELOWNA

Based on information provided by CoK, the following additional Site works occurred in 2022:

- April 13, 2022:
 - Well GL27-1: Steel stickup well protector installed by Keltech.
 - Well 06BH02: The well was observed to have standing water around the well pipe. The well casing was repaired and extended upwards and better protection of the well casing was installed.
- July 27, 2022: Monitoring well 09BH07-D well casing was extended upward. Completed by Keltech.
- October 2022: Odd water levels were noted at GL42-1 and GL42-3, along with standing water and cracked concrete. It was suspected that wells were broken at the top coupling causing irrigation water to leak down. Samples from GL42-2 were considered out of caution. Q4 samples were not taken in these wells.
- October 12, 2022: The well casings of GL13-1, GL17-1, GL17-2, GL27-2, GL27-3, and GL27-4 were extended prior to Q4 level readings. Resurvey required.
- 2022: CoK suspected surface water infiltration due to surface seal desiccation at GL12-1. Therefore, data was considered invalid and will not be discussed hereafter in this report regarding 2022 analytical results.
- November 22, 2022: The wells GL42-1, GL42-2 and GL42-3 and GL12-1 were inspected via camera by Keltech as requested by the CoK. Breaks in the pipe were identified near surface in GL42-1 and GL42-3. GL42-1 data was considered invalid due to suspect surface water migration due to break and will not be discussed hereafter in this report regarding 2022 analytical results.
- December 1, 2022: GL42-1 and GL42-3 were repaired, and GL12-1 was decommissioned. Based on observations made by Keltech during repairs, staining from surface run-off infiltration was observed below the cracks in the PVC riser pipe in both GL42-1 and GL 42-3.

No other key Site events or operational changes were reported by CoK for 2022.

5.0 REGULATORY CRITERIA

In 2022, Keltech consulted the CoK to refine the applicable regulatory criteria as follows.

- BC Contaminated Sites Regulation (CSR) aquatic life water use, freshwater (AWf) standards apply because of the presence of surface water bodies on-Site, as well as off-Site within 500 m of the Site.
- BC CSR drinking water use (DW) standards apply for future drinking water use and are considered when determining the applicability of DW standards to the Site. Future drinking water use applies to all drinking water aquifers below a site whether or not current drinking water use applies. Drinking water aquifers are saturated geological units that have suitable hydraulic properties and natural water quality to support a single-family domestic water supply. Where information is unavailable or inadequate to demonstrate an absence of drinking water aquifers below a site, drinking water aquifers are considered to exist.
- BC CSR Irrigation water use (IW) applies where the groundwater or surface water at or nearby a site that is currently used for irrigation. Nearby irrigation wells or surface water intakes are those located within a radial distance of 500 metres from the site property boundary or, where the groundwater contamination source extends beyond the property boundary, a radial distance of 500 metres from the groundwater contamination source. If the groundwater flow direction has been reliably determined using approved methods, nearby current uses may be limited to include irrigation and livestock watering wells or surface water intakes located

within 100 metres upgradient and 500 metres cross gradient or downgradient of the site property boundary or outer extent of the groundwater contamination source where it extends beyond the property boundary.

- BC Water Quality Guidelines – Aquatic life, fresh water (BCWQG AW) (ENV): long term and short-term guidelines were applicable to the freshwater aquatic ecosystems of Northeast Pond and Little Robert Lake.
- BC Water Quality Guidelines – Irrigation water (BCWQG IW): Long term and short-term standards were applicable to waterbodies used for irrigation, namely Tutt Pond and Bredin Pond.
- The BC CSR Technical Guidance Document 15 (TG15): TG15 Concentration Limits for the Protection of Aquatic Receiving Environments, Version 2.0, dated November 1, 2017, further clarifies the application of CSR AW standards and BCWQG's AW and IW guidelines as follows:
 - In upland groundwater, CSR AW standards apply to groundwater located at 10 m distance beyond the high-water mark of an aquatic receiving environment.
 - For maintained watercourses, the CSR AW standards apply to surface water, porewater and groundwater and ENV encourages that wherever possible, the BCWQG be met in all watercourses (including maintained watercourses) at the point where surface water enters an aquatic receiving environment.
 - Surface water and porewater in aquatic receiving environments other than maintained watercourses should be evaluated against the BC (Approved and Working) Water Quality Guidelines.
- Guidelines for Canadian Drinking Water Quality (GCDWQ): were only applied to the most down-gradient well series (i.e., GL28 series, 09BH-06 and 09BH-04).

Leachate at the Site is treated with Bioxide® at Leachate 2 (S Leachate Wet Well) and Leachate 3 (where it mixes with McKinley waste) locations to address potentially elevated hydrogen sulfide levels. The sewage/leachate mixture is also aerated, and odours are treated by a Biorem Multi-Stage Biofilter. The treated sewage/leachate is discharged into the municipal sanitary sewer system on Glenmore Road and is ultimately treated at the CoK's Wastewater Treatment Facility, therefore, analytical results for treated leachate samples were not compared to the applicable groundwater standards, and/or surface water guidelines (CoK 2021).

The summary of applicable standards and guidelines is shown in Table D.

Table D: Summary of Applicable Regulatory Criteria

Applicable Criteria:		CSR			CGDWQ	BCWQG (LT, ST)	
Water	Location	IW	AW	DW	MAC, AO	AW	IW
GW	Monitoring Wells	Y	Y	Y	GL28 series only (By ENV and DOCP)	N	No, but applied based on DOCP (CoK 2018)
SW	Bredin Pond, Tutt Pond	N	N	N	N	AC	Y
	Northeast Pond, Little Robert Lake, Robert Lake	N	N	N	N	Y	AC
	Slough, Bubna Slough, Slough #2	N	N	N	N	AC	AC
Leachate	Leachate manholes	N	N	N	N	N	N

Notes:

Y: Yes, based on regulated criteria

N: Not, based on regulated criteria

AC: Criteria are Appplied being Conservative

LT – long term average water quality guideline

ST – short term maximum water quality guideline

6.0 2022 ANNUAL WATER QUALITY PROGRAM RESULTS

6.1 Methodology

Keltech understands that CoK staff conducted the 2022 water monitoring and sampling program using methodologies that were consistent with the following applicable reference documents:

- *BC Field Sampling Manual, Part E Water and Wastewater Sampling, Groundwater Pollution Monitoring* is available online at: https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/monitoring/emre/bc_field_sampling_manual_part_e.pdf

A summary of the 2022 field procedures and methods used at the Site is appended to this report (Appendix E).

6.2 Field Observations

Monitoring and sampling of groundwater wells included field evidence of contamination such as odours, and oily and/or metallic sheen on the surface of the water. Table E summarizes 2022 observations by monitoring well ID.

Table E: Field Observations by Monitoring Well ID

Date	MW ID	Odour	Sheen	Colour
May 30, 2022	GL2-1	None	Chunky rainbow sheen	Orange flecks in water
May 30, 2022	GL2-2	None	None	Brown grey
June 2, 2022	GL12-1	None	None	Yellow
May 31, 2022	GL17-1	Musty	None	Black flecks in water
May 31, 2022	GL20-1	Sewage/sulphur-like	None	Dark yellow
June 6, 2022	GL23-1	None	None	Black flecks
June 6, 2022	GL29-1	Sulphur-like	None	Yellow

Notes:

MW: monitoring well

6.3 Groundwater and Surface Water Elevations

The results of groundwater and surface water elevation monitoring, along with the historical data, are summarized in attached Tables 2A and 2B. Based on 2022 March and September measurements, the inferred groundwater flow direction was from north to south and inwards from the east and west with a localized mounding to the south of the Phase 3 Slough (Figure 3 (March) and Figure 4 (September)). The inferred groundwater flow direction is consistent with that of previous years.

In general, vertical groundwater flow is in the upwards direction within the lower elevations and minimal vertical groundwater migration occurs near the sidewalls of the valley. At some nested monitoring locations (e.g., GL15, GL27, and GL28 series), a downwards vertical gradient has been observed. Groundwater flow throughout the Site

is also noted to be upwards provided the leachate level within the landfill is maintained at an elevation at or below 437 m AMSL (CoK, 2018).

The historical groundwater elevations with respect to the elevations of the nearby surface water bodies are plotted in attached Figures 5A through 5F.

Fluctuations

Observations of fluctuations in 2022 water elevations were as follows:

- In 2022, at the northeast part of the Site (Figure 5A), GL1-1 and GL1-2 had an elevation fluctuation of about 0.710 m.
- At the northwest area of the Site (Figure 5B), nearby Bredin Pond, had a fluctuation of 0.120 m from 438.526 m to 438.646 m.
- The maximum groundwater fluctuation of 0.442 m from 439.725 m to 440.177 m was in monitoring well GL4-1. Similarly, a groundwater fluctuation of 0.437 m was found in GL4-2.
- The Slough had a fluctuation of 0.735 m.
- At Centre A –at the north part of Phase 2 - (Figure 5C) - GL7-1 had a maximum groundwater fluctuation of 0.422 m.
- At Centre B –at the centre part of Phase 3 (Figure 5D) – GL31-2 has the highest fluctuation of 0.374 m.
- At Centre South – at the south part of Phase 3 and the south part of the Site (Figure 5E) – the maximum fluctuation of 1.747 m was found in well 09BH03, which is located to the southeast of Phase 3 in 2022.
- At Centre West/Tutt Pond (Figure 5F) – west of Phase 3 - the groundwater fluctuations were 0.470 m from 438.088 m to 438.558 m.
- A maximum fluctuation of 0.815 m was found in GL15-1.

The fluctuations of water levels in monitoring wells and surface water ponds are considered mainly due to seasonal variation. The ranges of fluctuations of both surface water elevations and groundwater are consistent with historical data.

6.4 Groundwater Analytical Results

The groundwater quality data for the spring and fall 2022 sampling programs were tabulated and compared to applicable standards and guidelines and assessed for general spatial and temporal trends in concentrations. Tabulated results are provided in Table 3. Historical Analytical Data for 2010 to 2021 is provided in Appendix C. The CARO Analytical Services (CARO) laboratory Certificates of Analysis (COA) for groundwater testing are held on file at Keltech and are available upon request.

Based on the 2022 inferred groundwater contours, groundwater monitoring wells were classified into three groups:

1. Upgradient, indicating baseline and/ potential background wells,
2. Landfill and compost facility footprint wells, indicating High to Moderate Leachate-Impacted wells; and
3. Downgradient wells, indicating the potential migration of chemicals off the Site.

A list of the wells, grouped by the above classifications, along with the lithology, and exceedances of one or more parameter with respect to the applicable standards and guidelines are presented in Table F below.

Table F. Well Locations Based on Landfill and Compost Facility Footprints and Exceedances

Well Location	Monitoring Well ID	Lithology	Exceedance of ≥ 1 Parameters
Upgradient	GL41-1 (onsite at north Site boundary)	Volcanic bedrock, brown, hard	Yes
	GL41-2 (onsite at north Site boundary)	Gravel and silt, trace clay (till)	Yes
	GL41-3 (onsite at north Site boundary)	Silt, some clay, sand, and trace silt	Yes
	GL23-1 (offsite northeast)	Sand, compact	Yes
	GL15-1 (offsite west)	Bedrock	Yes
	GL15-2 (offsite west)	Sandy silt and gravel (till)	Yes
Landfill and Compost Facility Footprints	GL2-1 (landfill) (artesian)	Silty clay followed by silty sand	Yes
	GL2-2 (landfill)	Silty clay	Yes
	GL4-1 (landfill)	Silty gravel and sand	Yes
	GL4-2 (landfill)	Silty clay	Yes
	GL5-2 (landfill)	Sand followed by gravelly silt (till)	Yes
	GL35-3 (landfill)	Silty sand with gravel (till)	Yes
	GL20-1 (landfill)	Silty sand, some gravel, and traces of clay and cobbles (till)	Yes
	GL16-1 (landfill)	Very dense slit to laminated slit (weathered bedrock)	Yes
	GL17-1 (landfill) (artesian)	Bedrock	Yes
	GL12-1 (compost)	Silty sand (till)	Yes
	GL27-1 (compost) (artesian)	Bedrock, some fractures	Yes
	GL27-3 (compost)	Layered clay followed by silty clay, some sand and gravel (till)	Yes
	GL29-1 (compost)	Sand and silt followed by bedrock	Yes
	GL29-2 (compost)	Sand and silt (till)	Yes
Downgradient	GL42-1 (onsite south Site boundary)	Sand and gravel, trace silt (till)	Yes
	GL42-2 (onsite south Site boundary)	Clayey silt	Yes
	GL39-1 (onsite south Site boundary)	Silt, some sand, clay and gravel (till)	Yes
	GL39-2 (onsite south Site boundary)	Silty sand, trace gravel and clay	Yes
	GL 28-1 (south of Site boundary)	Sand, some gravel	Yes
	GL 28-2 (offsite south of Site boundary)	Silty sand	Yes
	GL 28-3 (offsite south of Site boundary)	Layered silty clay, some sand	Yes
	09BH03 (offsite southeast)	Sand, trace silt	Yes
	09BH06-D (artesian, farthest offsite)	Silty sand	Yes

A general summary of the analyzed parameters that exceeded applicable regulatory criteria, plus, what wells the exceedances occurred at are presented in Table G below. The table also compares relative locations of the wells by the Upgradient (baseline), Landfill and Compost Facility footprints, and Downgradient areas; the table is further discussed below.

Table G. Comparison of Groundwater Quality Exceedances by Location

Well Location:	Upgradient		Landfill and Compost Facility Footprints		Downgradient	
Leachate Impact	No Impact (Baseline Wells)		Moderate to High Impact		Low to Minimal Impact	
Parameter	Exceeded Criteria	MW ID	Exceeded Criteria	MW ID	Exceeded Criteria	MW ID
Field Conductivity & TDS	>BCWQG IW	All upgradient wells	>BCWQG IW	All footprint wells	>BCWQG IW	All downgradient wells
Total Alkalinity	>BCWQG IW	All upgradient wells	>BCWQG IW	All footprint wells	>BCWQG IW	All downgradient wells
Ammonia (Total, as N)	-	-	>CSR AW	GLs 12-2, 20-1, GL 35-3 (2022, 2011-2014)	-	-
Nitrate	-	-	-	-	>CSR DW, >GCDWQ	GL 28-2
Chloride	>CSR IW, >CSR DW, >BCWQG IW	GLs 41-1, 41-2, 41-3, 15-2.	>CSR IW, >CSR DW, >BCWQG IW	GLs 5-2, 2-1, 20-1, 27-3, 29-2, 35-3, 12-2	>CSR IW, >BCWQG IW	GLs 39-1, 39-2
Fluoride	>BCWQG IW	GL 15-1	>BCWQG IW	GLs 4-1, 4-2, 17-1, 27-1, 29-2	-	-
Sulfate	>CSR DW	GL 15-2	>CSR AW, >CSR DW	GLs 2-1, 4-1, 16-1, 27-3, 29-2, 35-3	>CSR AW, >CSR DW, >GCDWQ	GLs 28-1, 28-2, 28-3, 39-1, 39-2, 42-2, 09BH03
Dissolved Chromium	>CSR IW, >BCWQG IW LT	GL15-2	>CSR AW, >CSR IW, >BCWQG IW LT	GL 20-1	>CSR AW, >CSR IW, >BCWQG IW LT	09BH03
Dissolved Molybdenum	>CSR IW, >BCWQG IW LT	GLs 23-1, 41-1, 15-2, 41-1	>CSR IW, >BCWQG IW LT	GLs 2-1, 2-2, 4-1, 4-2, 5-2, 16-1, 27-1, 27-3, 29-1, 29-2, 20-1	>CSR IW, >BCWQG IW LT	GLs 28-3, 39-2, 42-2, 09BH06-D, 09BH03, 28-1
Dissolved Selenium	>CSR DW, >BCWQG IW ST	GL15-2	-	-	CSR AW, >CSR IW, >CSR DW, BCWQG IW	09BH03
Dissolved Uranium	>CSR AW, >CSR IW, >CSR DW, >BCWQG IW	GLs 23-1, 41-1, 41-2, 41-3, 15-2	>CSR AW, >CSR IW, >CSR DW, >BCWQG IW	GLs 4-1, 4-2, 5-2, 20-1, 27-3, 29-1, 29-2, 35-3	>CSR AW, >CSR IW, >CSR DW, >BCWQG IW, >GCDWQ	GLs 28-1, 28-2, 28-3, 39-1, 39-2, 42-2, 09BH03
Dissolved Iron	-	-	>CSR IW, >CSR DW	GLs 20-1, 35-3	-	-
Dissolved Manganese	>CSR IW	GL 23-1	>CSR IW, >CSR DW, GDWQ	GLs 2-2, 4-2, 20-1, 27-3, 29-1, 35-3, 29-2, 28-1	>CSR IW, >GDWQ	GLs 28-1, 28-2, 28-3, 42-2
Dissolved Boron	-	-	>CSR IR, >BCWQG LT	GL 20-1	-	-
Dissolved Cobalt	-	-	> CSR AW, CSR IW, CSR DW, >CSR IR, >BCWQG LT	GLs 20-1, 27-3, 29-1	>CSR DW	GL28-3

Notes:

MW: monitoring well

ID: identifier

6.4.1 Groundwater Quality at Upgradient (Baseline) Monitoring Wells

The baseline wells located upgradient of the landfill and compost facility footprints had exceedances of applicable regulatory criteria.

- The concentrations of TDS, conductivity (field), total alkalinity, chloride, fluoride, sulfate, dissolved chromium, molybdenum, selenium, uranium, and manganese concentrations at baseline wells exceeded one or more of the applicable standards and guidelines as shown in Table G.
- The concentration of dissolved iron in all baseline wells was below BCWQG AW in 2022.
- The concentration of dissolved molybdenum in GL41-1 exceeded the applicable criteria in 2022, but not in 2021. The results were generally consistent with historical trends for these parameters.

6.4.2 Groundwater Quality at Landfill and Compost Facility Footprint (Moderate to High Leachate-Impacted) Monitoring Wells

For monitoring wells located within the landfill and compost facility footprints, concentrations of TDS, conductivity (field), total alkalinity, ammonia, chloride, fluoride, sulfate, dissolved chromium, molybdenum, iron, manganese, boron, and cobalt exceeded one or more of the applicable standards and guidelines.

- The concentrations of ammonia and dissolved iron exceeded the application standards at well GL20-1, which may be attributed to landfilling activity; the high concentrations of ammonia at these locations (produced by waste materials degradation) may be due to leachate and agricultural activity to the west.
- The concentrations of ammonia and dissolved iron exceeded the application standards at well GL35-3, located with the Phase 3 Slough.
- The concentration of nitrate exceeded the applicable criteria in off-Site downgradient well GL28-2 which is likely due to surrounding agricultural activity including livestock.
- Concentrations of dissolved selenium exceeded the applicable criteria in upgradient well (GL15-2) and downgradient well (09BH03) only, which may be due to activities other than landfilling.
- Key leachate indicator parameters in wells GL16-1, GL27-3 and GL35-3 (cross/downgradient of Phase 3 Slough), had concentrations of ammonia, chloride, fluoride, sulfate, COD, boron, and dissolved iron that were consistent with results from 2018 to 2021.
- Concentrations of ammonia, sulfate, and dissolved iron in GL35-3 exceeded regulatory criteria; this is consistent with historical fluctuations of these substances at this location. Exceedances may be attributed to increased landfilling of waste.

A summary table of 2018 to 2022 leachate indicator parameters is below.

Table H. Summary of 2018 to 2022 Analytical Results for Leachate Indicator Parameters

Location	Year	Ammonia, Total (as N) (µg/L)	Chloride (mg/L)	Fluoride (µg/L)	Sulfate (mg/L)	COD (mg/L)	Boron µg/L)	Dissolved Iron µg/L)
S Leachate Wet Well	2018 to 2021	17,800 to 103,000	487 to 980	490 to <1,000	1,200 to 2,990	512 to 988	1,160 to 2,790	29.3 to <200
	2022	38,900 to 69,300	684 to 859	<1,000	1,620 to 1,880	658 to 887	1,610 to 1,990	23.7 to <200
GL16-1	2018 to 2021	27 to 256	95.1 to 273	690 to 1,240	1,110 to 4,040	24	65.3 to 71.2	78.9 to 424
	2022	188	130	<1,000	1,410	21	76.5	235
GL27-3	2018 to 2021	57 to 806	442 to 569	970 to <50,000	9,330 to 11,400	20 to 21	30.4 to 42.9	2,260 to 4,610
	2022	933	585	<1,000	10,300	<20	32.4	3,940
GL35-3	2018 to 2021	1,220 to 1,720	325 to 351	1,410 to 1730	3,050 to 3,510	<20 to 26	55.4 to 87	463 to 24,800
	2022	1,360	344	<1,000	2940	<20	58.8	12,500
GL12-1	2018 to 2021	1,270 to 7,300	480 to 1050	1,190 to 1,840	3,620 to 9,180	458 to 566	94.2 to 214	8,590 to 24,400
	2022	8 to 6,910	559 to 598	1050	3,870 to 3,910	563 to 613	57.1 to 68.0	15,500 to 21,000

6.4.3 Groundwater Quality at Downgradient

(Low to Minimal Leachate-Impacted) Monitoring Wells

Based on the 2022 analytical results for monitoring wells located downgradient from the landfill and compost facility footprint, concentrations of TDS, conductivity (field), total alkalinity, chloride, sulfate, dissolved chromium, molybdenum, selenium, uranium, manganese, and cobalt exceeded one or more applicable standards and guidelines. These results are generally consistent with the previous years.

Concentrations of fluoride were below the applicable standards and guidelines in all downgradient wells compared to exceedances in GL28-1 and GL39-1 in 2021. Unlike 2021 results, concentrations of cobalt were below the applicable standards and guidelines in GL29-1 and exceeded in GL28-3 in 2022. The concentrations of selenium exceeded in GL 28-1, GL28-3 and 09BH06-D, but not in 2021 results.

6.4.4 Groundwater Quality Gradient Across the Site

The potential for substances in groundwater to migrate off the Site is visually presented in the appended graphs showing leachate indicator parameters chloride, TDS, COD, and alkalinity. See Figures 6A to 6D (For reference, the corresponding sampling location # shown on the graphs for each monitoring well is provided in Table 3).

The concentrations of chloride, COD, TDS, and alkalinity generally increased from upgradient wells to footprint wells. Specifically, concentrations of chloride increased from upgradient wells to footprint wells and decreased in downgradient wells, generally to lower concentrations than in the upgradient wells.

The concentrations of COD increased from the upgradient wells to the footprint wells but were lower in downgradient wells.

The graphs for sulfate and TDS show gradients of increasing concentrations from upgradient wells (baseline) to downgradient wells.

The concentrations of alkalinity exceeded the applicable criteria in all wells; however, the range of their concentrations upgradient and downgradient of the Site were similar.

6.5 Surface Water Quality

Keltech tabulated the 2022 analytical results for on-Site ponds - Northeast Pond, Bredin Pond, Tutt Pond, and Slough, and for off-Site ponds - Slough #2, Bubna Slough, Little Robert Lake, and Robert Lake. Results were compared to long-term and short-term BCWQG AW and IW criteria.

Slough #2 and Bubna Slough located upgradient were the background sample points. Little Robert Lake and Robert Lake, located downgradient of the Site, were used to determine the potential areal extent of surface water contamination, if any. The tabulated historical water quality data of surface water (2010 to 2021) is provided in Appendix A. The CARO laboratory COAs for surface water testing are held on file at Keltech and are available upon request.

6.5.1 Surface Water Quality at On-Site and Off-Site Ponds

The surface water quality of samples collected from the on-Site ponds - Northeast Pond, Bredin Pond, Tutt Pond, and Slough and off-Site ponds were generally consistent with previous years monitoring results. In 2022, the parameters that exceeded applicable BCWQG AW (LT or ST) and/or BCWQG IW (LT or ST) at on-Site ponds were:

- chloride, alkalinity, phosphorus total (as P), aluminum, uranium, and molybdenum in all four ponds
- ammonia in Northeast Pond, Bredin Pond, and Slough
- sulfate in Northeast Pond, Tutt Pond, and Slough
- fluoride in Northeast and Bredin Ponds
- total iron in Tutt Pond and Slough and
- arsenic, boron, and zinc in Slough.

Slough had consistently higher concentrations of parameters, which may be due to long-term contamination by wastes/or leachate; the evaporation process may have contributed to the elevated concentrations. The exceedances of these parameters at on-Site ponds may be attributed to local background water quality, which are further explained in the following Section 6.5.2.

In the off-Site ponds, the parameters of

- chloride, alkalinity, phosphorus total (as P), conductivity and total aluminum exceeded the applicable water quality guidelines in Bubna Slough (off-Site, upgradient) and all on-Site ponds, except for total aluminum in Bubna Slough.

- Sulfate, uranium, and arsenic exceeded the applicable water quality guidelines at Slough #2 (background), although it is located off-catchment.
- Fluoride, zinc, and boron exceeded applicable guidelines at on-Site surface water, but did not exceed the applicable guidelines at downgradient surface waters (Little Robert Lake or Robert Lake), indicating unlikely influence from on-Site surface water and/or landfill in these parameters downgradient.
- Ammonia and molybdenum which exceeded the applicable guidelines at on-Site ponds, also exceeded at downgradient Little Robert Lake and/or Robert Lake.

6.5.2 Surface Water Quality Gradient at Ponds Across the Site

The potential for leachate indicator parameters substances in surface water to migrate across and/or off the Site is visually presented in the appended graphs showing leachate indicator parameters of chloride, TDS, COD, alkalinity, ammonia, and phosphorus total (as P). See Figures 7A to 7F (For reference, the sampling location # shown on the graphs for each pond is provided in Table 4).

The interconnectivity of the upgradient, on-Site, and downgradient ponds with sub-surface hydrogeology is unknown, however, surface runoff with or without waste contamination may still impact some of the surface water quality.

Concentration ranges of chloride and ammonia at downgradient ponds (Little Robert Lake and Robert Lake) were either lower or similar to those in the upgradient pond (Bubna Pond), which suggests that landfill activities are unlikely to be influencing concentrations of chloride and ammonia in the ponds.

Concentrations of TDS and phosphorus total (as P) increased from upgradient pond (Bubna Slough) to on-Site ponds and both downgradient ponds (Little Robert Lake and Robert Lake); the increased concentration may be attributable to on-Site activities.

Concentrations of COD and alkalinity increased from upgradient ponds to Robert Lake (farthest downgradient) but did not increase in Little Robert Lake. The increase in the concentrations of these parameters in Robert Lake likely due to local conditions rather than the Site.

6.5.3 Leachate Quality

2022 analytical results for leachate quality are summarized in attached Table 6. Tabulated historical water quality data of leachate (2010 to 2021) are provided in Appendix A. The historical trends of groundwater and leachate quality are presented graphically in Figures 8A to 8F. At this time, leachate quality is not regulated with applicable water quality standards/guidelines, therefore, this leachate quality discussion is focussed on key leachate indicator parameters. The CARO laboratory COAs for leachate testing are held on file at Keltech and are available upon request.

Concentrations of leachate indicator parameters varies across the Site. The concentrations of ammonia, phosphorus total (as P), total alkalinity and sodium were moderate to higher; whereas the concentrations of chloride, total hardness, BOD, and COD were moderate compared to the typical strength of leachate provided in the BC ENV Guidelines. On the other hand, the concentration of nitrite in the leachate was moderate to lower compared to the typical leachate quality provided in the BC Guidelines for Environmental Monitoring At Municipal Solid Waste Landfills (https://www2.gov.bc.ca/assets/gov/environment/waste-management/garbage/guidelines_environmental_monitoring_municipal_solid_waste_landfills.pdf)..

The historical leachate concentrations for the indicator parameters ammonia, chloride, fluoride, COD, boron, and dissolved iron are presented in Figure 8A to 8F. The leachate quality results of 2022 are consistent with historical results.

The concentrations of ammonia in leachate are significantly higher than that in groundwater monitoring wells which is to be expected considering calcium ammonia nitrate (Bioxide) is added to the leachate. Among the leachate manholes, P1 Leachate MH-2 had consistently higher ammonia concentrations.

7.0 PROPOSED 2023 MONITORING PROGRAM

The following recommendations are provided for the 2023 annual water quality program.

- Groundwater and surface levels from all accessible wells on and off the Site should continue to be recorded on a quarterly basis to observe seasonal trends.
- Groundwater samples should continue to be collected semi-annually from the wells listed in Table 1 (2022 water quality program). Sampling should continue to be conducted each spring, when groundwater levels are highest, and in the fall when groundwater levels are lowest. All groundwater samples should continue to be measured and/or analyzed for the parameters listed in Table A.
- Surface water sampling should continue to be collected on a quarterly basis at Bredin Pond, Tutt Pond, Northeast Pond and the Slough to confirm the surface water quality at these locations and its potential impact on groundwater quality in areas where this surface water is used for irrigation purposes. To further characterize baseline surface water quality for the Site, sampling should continue on a quarterly basis at off-Site surface water locations (i.e., Little Robert Lake, Robert Lake, Bubna Slough and Slough #2). All samples should continue to be measured and/or analyzed for the parameters listed in Table B (2022 water quality program).
- Leachate sampling and analysis should be conducted quarterly from each leachate collection sump, according to Table C (2022 water quality program). Leachate samples and groundwater samples should be taken at the same time to best compare it to groundwater quality.
- All water sampling and monitoring should continue to be evaluated and compared to the applicable standards and guidelines.

8.0 QUALITY ASSURANCE AND QUALITY CONTROL

The details of the recommended and implemented QA/QC program are provided in Appendix F.

9.0 SUMMARY AND CONCLUSIONS

Based on Keltech's review and analysis of the water sampling and analytical data provided by the CoK, the following conclusions are made:

- **Groundwater flow and quality:**
 - The inferred groundwater flow direction was somewhat variable at the Site and surrounding area due to the local topography and the constructed facilities. The inferred groundwater flow direction was from north, inwards from the east and west, and towards the south, with a localized mounding to the south of the Phase 3 Slough at GL17 series, GL13-1 and GL29 series in both spring and fall; this is consistent with previous years.

- In baseline wells, the concentrations of TDS, conductivity (field), total alkalinity, chloride, fluoride, sulfate, dissolved chromium, molybdenum, selenium, uranium, and manganese exceeded some applicable standards and guidelines.
 - In the footprint wells, the concentrations of TDS, conductivity (field), total alkalinity, ammonia (total), chloride, fluoride, sulfate, dissolved chromium, molybdenum, iron, manganese, boron, and cobalt exceeded some applicable standards and guidelines.
 - The 2022 concentrations of chloride, COD, TDS, and alkalinity generally increased from upgradient wells to footprint wells, indicating leachate migration to the on-Site groundwater beneath the footprint.
 - In 2022, substance concentrations of TDS in groundwater increased from upgradient wells (baseline) to downgradient wells.
 - Concentrations of chloride in groundwater increased from upgradient wells to footprint wells, but the concentrations were lower in downgradient wells indicating natural attenuation and/or unlikely impact of the Site on the concentration of chloride off the Site.
 - The 2022 concentrations of ammonia, chloride, fluoride, sulfate, chemical oxygen demand, boron, and dissolved iron in groundwater are consistent with historical trends.
 - In well GL35-3, compared to 2021, the 2022 concentrations of ammonia, sulfate, and dissolved iron exceeded applicable criteria however were consistent with historical data for this well.
 - **Surface water quality:**
 - In 2022, the parameters that exceeded applicable guidelines at on-Site ponds - Northeast Pond, Bredin Pond, Tutt Pond, and Slough were:
 - chloride, alkalinity, phosphorus total (as P), aluminum, uranium, and molybdenum at all four ponds,
 - ammonia in Northeast Pond, Bredin Pond, and Slough; sulfate in Northeast Pond, Tutt Pond, and Slough; fluoride in Northeast and Bredin Ponds,
 - total iron in Tutt Pond and Slough; and
 - arsenic, boron, and zinc in Slough only. Slough has consistently higher concentrations of parameters.
- Field conductivity exceeded applicable guidelines at all on- and off-Site surface water sample points
- The ranges of concentrations of chloride and ammonia at the downgradient ponds (Little Robert Lake and Robert Lake) were either less than or consistent with Bubna Pond.
- The concentrations of sulfate, TDS, phosphorus total (as P), and uranium increased from upgradient pond (Bubna Slough) to on-Site ponds and both downgradient ponds (Little Robert Lake and Robert Lake).
- Generally, the surface water quality of the samples collected at on-Site ponds and off-Site ponds were consistent with previous years.
- **Leachate quality:**
 - Leachate strength varies across the Site.
 - The concentrations of ammonia, phosphorus total (as P), total alkalinity, and sodium were higher; whereas the concentrations of chloride, total hardness, BOD, and COD were moderate compared to the typical strength of leachate provided the BC Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills

- The concentration of nitrite in the leachate was lower compared to the typical leachate quality.
- The leachate quality results of 2022 are consistent with the historical results.
- The concentrations of ammonia in leachate are higher than that in groundwater monitoring wells, which may be due to the decomposition of organic matter in waste piles lying above the leachate collection pipes. Among the leachate manholes, P1 Leachate MH-2 had consistently higher ammonia concentrations.

10.0 RECOMMENDATIONS

Based on the results of the 2022 water quality monitoring program, Keltech recommends the following:

- Conduct a hydrogeological assessment of the Site to assist in understanding the groundwater-surface water relationship and potential migration of leachate to groundwater both on- and off-Site. Keltech understands that the CoK has planned for a full hydrogeological assessment of the landfill in 2023. The borehole logs of the 87 monitoring wells installed to date are available to inform the hydrogeological study.
- The CoK should consider the need for further investigation of groundwater flow or quality if any physical or operational changes are planned for the landfill.
- Keltech understands that CoK is planning a background water quality assessment in 2023.
- During monthly sampling events, monitor and record any operational changes, significant precipitation events, or other events/activities that may have a potential to affect the surface and ground water quality at the Site. Provide Keltech with these records for use in the preparation annual report.
- Continue the annual water monitoring program as specified for 2023.

11.0 LIMITATIONS

This report is intended and restricted for the sole use of City of Kelowna (the Client). Any use of this document by a third party, or any reliance on or decisions made based on findings described in this report, are the sole responsibility of such parties, and Keltech Environmental Ltd. accepts no responsibility for damages, suffered by any third party as a result of decisions made or actions conducted based on this report. No other warranties are implied or expressed.

Keltech Environmental Ltd. makes no representations, warranties, or guarantees as to any given sample (whether it be obtained by Keltech Environmental Ltd. or by the Client being representative of any given contaminant, handled, or otherwise managed by the Client. With regard to site assessment work, this report therefore cannot warranty that all building conditions are represented by those identified at specific test locations. All liability is limited to the fee charged.

The conclusions presented in this report represent the judgement of Keltech's assessor based on current environmental and health and safety standards, and on-site conditions on the date(s) cited in this report. While attempts have been made to relate the data and findings to applicable health, safety or environmental laws and regulations, the report shall not be construed to offer legal opinion, advice or representations as to the requirements of, or compliance with, environmental laws, rules, regulations or policies of federal, provincial or local government agencies.

12.0 CLOSURE

We trust the information contained herein meets your needs. Should you have any questions or comments, please do not hesitate to contact the undersigned at your earliest convenience.

Reviewed By:


Nancy Ann Fuller
P. Ag.
Nancy Fuller, P. Ag.
Project Scientist


Allan Robison, ASCT, EP
Principal, Senior Environmental Consultant

Peer Reviewed by:

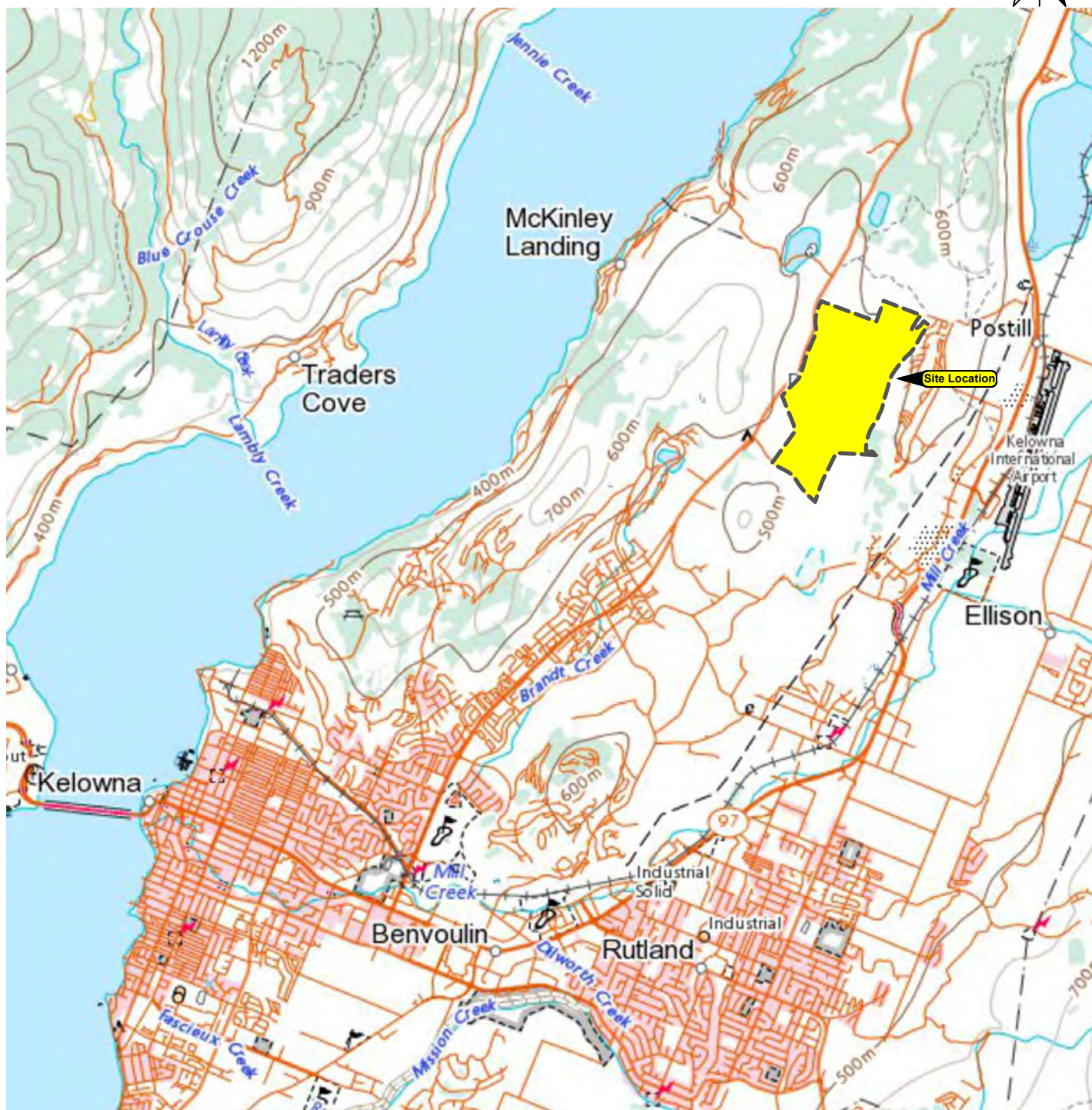

Gary Hamilton, P. Geo.
Contaminated Sites Approved Professional

GCS/NF/AR/GH

https://keltechenvironmental-my.sharepoint.com/personal/arobison_keltechenvironmental_com/Documents/Keltech/Projects/Active/2022/Projects/2022-059 CoK Annual GW Sampling Glenmore LF/2022/11 - Report/09.02 FINAL/2022-059_2022 Glenmore Landfill Water Quality Final Report_March 24, 2023.docx

REFERENCES

- British Columbia Government of BC 2013. *BC Field Sampling Manual, Part E Water and Wastewater Sampling, Groundwater Pollution Monitoring*: available online at: https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/monitoring/emre/bc_field_sampling_manual_part_e.pdf
- B.C. Ministry of Environment and Climate Change Strategy (ENV) 2021a. *British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture - Guideline Summary*. Water Quality Guideline Series, WQG-20. Prov. B.C., Victoria B.C.
- B.C. Ministry of Environment and Climate Change Strategy (ENV) 2021b. *Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture*. Water Quality Guideline Series, WQG-08. Prov. B.C., Victoria B.C.
- B.C. Ministry of Environment and Climate Change Strategy (ENV) 2022. *Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills*. https://www2.gov.bc.ca/assets/gov/environment/waste-management/garbage/guidelines_environmental_monitoring_municipal_solid_waste_landfills.pdf
- BC CSR 1997. *Environmental Management Act: Contaminated Sites Regulation*. BC Reg. 375/96. O.C. 1480/96. Last amended July 7, 2021 by B.C. Reg. 179/2021.
- CoK 2018. *2018 Design, Operations, and Closure Plan: Glenmore Landfill Kelowna, British Columbia*. City of Kelowna, Kelowna.
- Health Canada 2022. *Guidelines for Canadian Drinking Water Quality—Summary Tables*. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.



LEGEND

SITE

REFERENCES

1. REFERENCE IMAGE FROM NATURAL RESOURCES CANADA
TOPORAMA INTERACTIVE MAPPING SERVICE

PROJECT

2022 ANNUAL WATER MONITORING REPORT FOR
GLENMORE LANDFILL, 2720 JOHN HINDLE DRIVE, KELOWNA, BC

TITLE

SITE LOCATION MAP

CLIENT

CITY OF KELOWNA

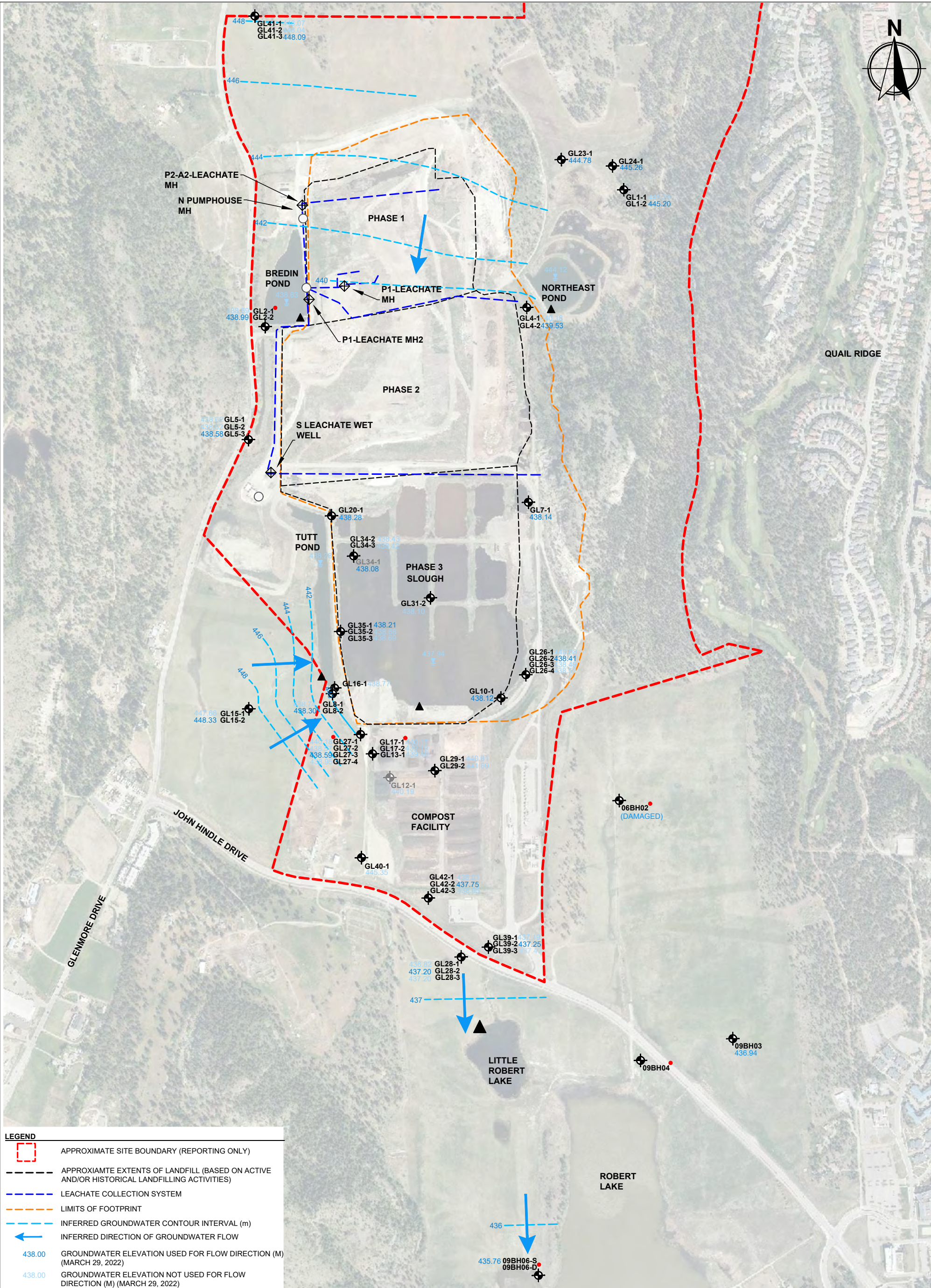
CONSULTANT

KTE Keltech
Environmental Ltd.

PROJECT No.	2022-059
REVISION	00
DATE	01-27-2023
CADD	AR
CHECK	GCS

FIGURE

1



LEGEND

APPROXIMATE SITE BOUNDARY (REPORTING ONLY)

APPROXIMATE EXTENTS OF LANDFILL (BASED ON ACTIVE AND/OR HISTORICAL LANDFILLING ACTIVITIES)

LEACHATE COLLECTION SYSTEM

LIMITS OF FOOTPRINT

INFERRED GROUNDWATER CONTOUR INTERVAL (m)

INFERRED DIRECTION OF GROUNDWATER FLOW

438.00

GROUNDWATER ELEVATION USED FOR FLOW DIRECTION (M) (MARCH 29, 2022)

438.00

GROUNDWATER ELEVATION NOT USED FOR FLOW DIRECTION (M) (MARCH 29, 2022)

438.00

SURFACE WATER ELEVATION (MARCH 29, 2022)

MONITORING WELL LOCATION

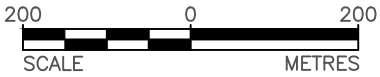
MONITORING WELL (DECOMMISSIONED)

INDICATES WELL WITH ARTESIAN CONDITIONS

APPROXIMATE MANHOLE LOCATION

APPROXIMATE LEACHATE SAMPLING LOCATION

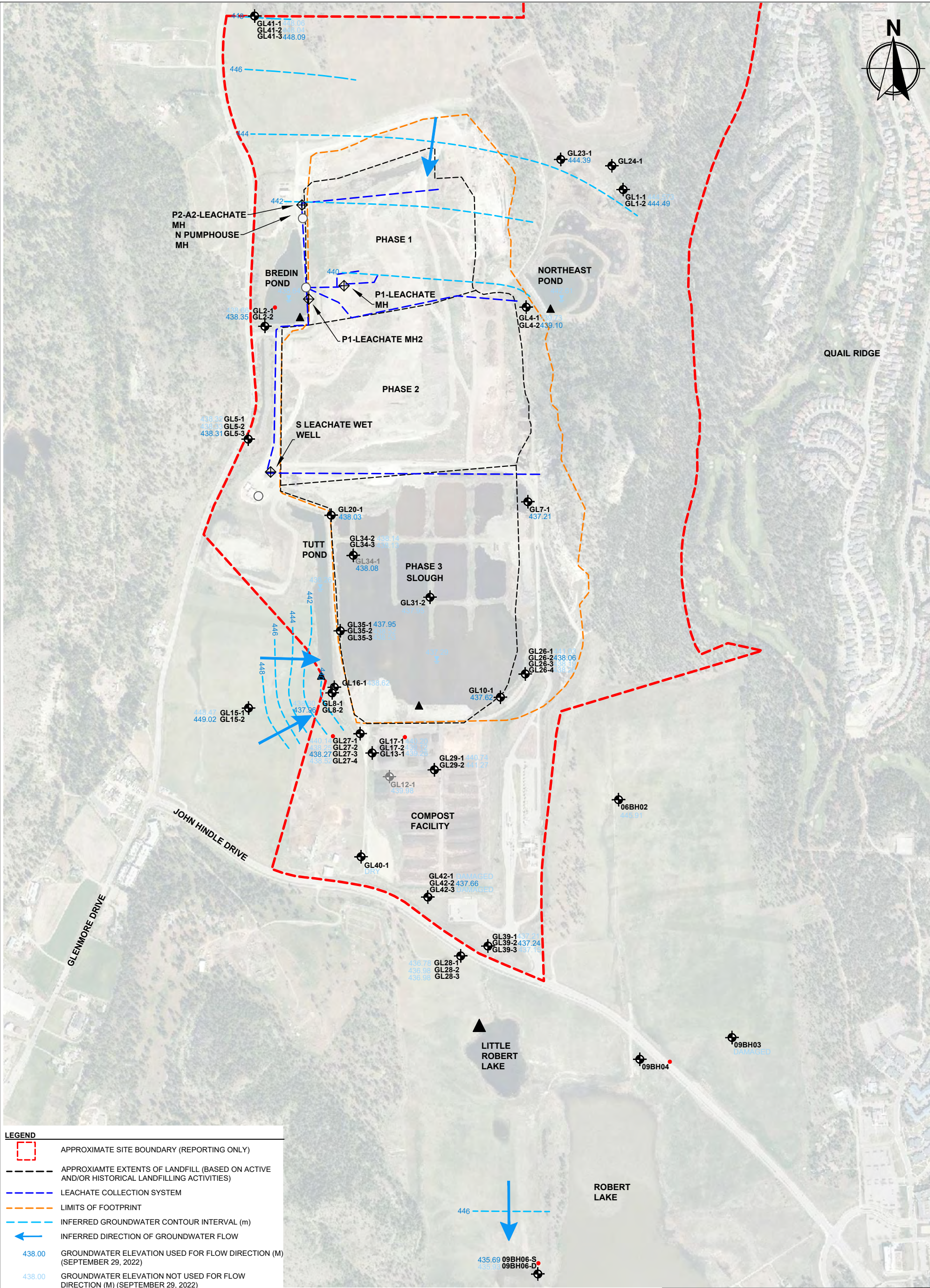
APPROXIMATE SURFACE WATER SAMPLING LOCATION



- REFERENCES
- 1.) COORDINATE REFERENCE: UTM ZONE 11n, NAD83

2.) MAP REFERENCES: KELOWNA ONLINE MAPPING SERVICE

PROJECT 2022 ANNUAL WATER MONITORING REPORT FOR GLENMORE LANDFILL 2720 JOHN HINDLE DRIVE, KELOWNA, BC			
TITLE INFERRED DIRECTION OF GROUNDWATER FLOW (MARCH 2022)			
CLIENT CITY OF KELOWNA			
CONSULTANT Keltech Environmental Ltd.	PROJECT No.	2022-059	FIGURE 3
	REVISION	00	
	DATE	03-03-2023	
	CADD	AR	
	CHECK	GCS	



LEGEND

APPROXIMATE SITE BOUNDARY (REPORTING ONLY)

APPROXIMATE EXTENTS OF LANDFILL (BASED ON ACTIVE AND/OR HISTORICAL LANDFILLING ACTIVITIES)

LEACHATE COLLECTION SYSTEM

LIMITS OF FOOTPRINT

INFERRED GROUNDWATER CONTOUR INTERVAL (m)

INFERRED DIRECTION OF GROUNDWATER FLOW

438.00 GROUNDWATER ELEVATION USED FOR FLOW DIRECTION (M) (SEPTEMBER 29, 2022)

438.00 GROUNDWATER ELEVATION NOT USED FOR FLOW DIRECTION (M) (SEPTEMBER 29, 2022)

438.00 SURFACE WATER ELEVATION (SEPTEMBER , 29, 2022)

MONITORING WELL LOCATION

MONITORING WELL (DECOMMISSIONED)

INDICATES WELL WITH ARTESIAN CONDITIONS

APPROXIMATE MANHOLE LOCATION

APPROXIMATE LEACHATE SAMPLING LOCATION

APPROXIMATE SURFACE WATER SAMPLING LOCATION

REFERENCES

1.) **COORDINATE REFERENCE:** UTM ZONE 11n, NAD83

2.) **MAP REFERENCES:** KELOWNA ONLINE MAPPING SERVICE

PROJECT
2022 ANNUAL WATER MONITORING REPORT
FOR GLENMORE LANDFILL
2720 JOHN HINDLE DRIVE, KELOWNA, BC

TITLE
INFERRED DIRECTION OF GROUNDWATER FLOW (SEPT 2022)

CLIENT
CITY OF KELOWNA

CONSULTANT

PROJECT No.	2022-059	FIGURE 4
REVISION	00	
DATE	01-24-2023	
CADD	AR	
CHECK	GCS	

FIGURE 5A - WATER ELEVATIONS NORTHEAST

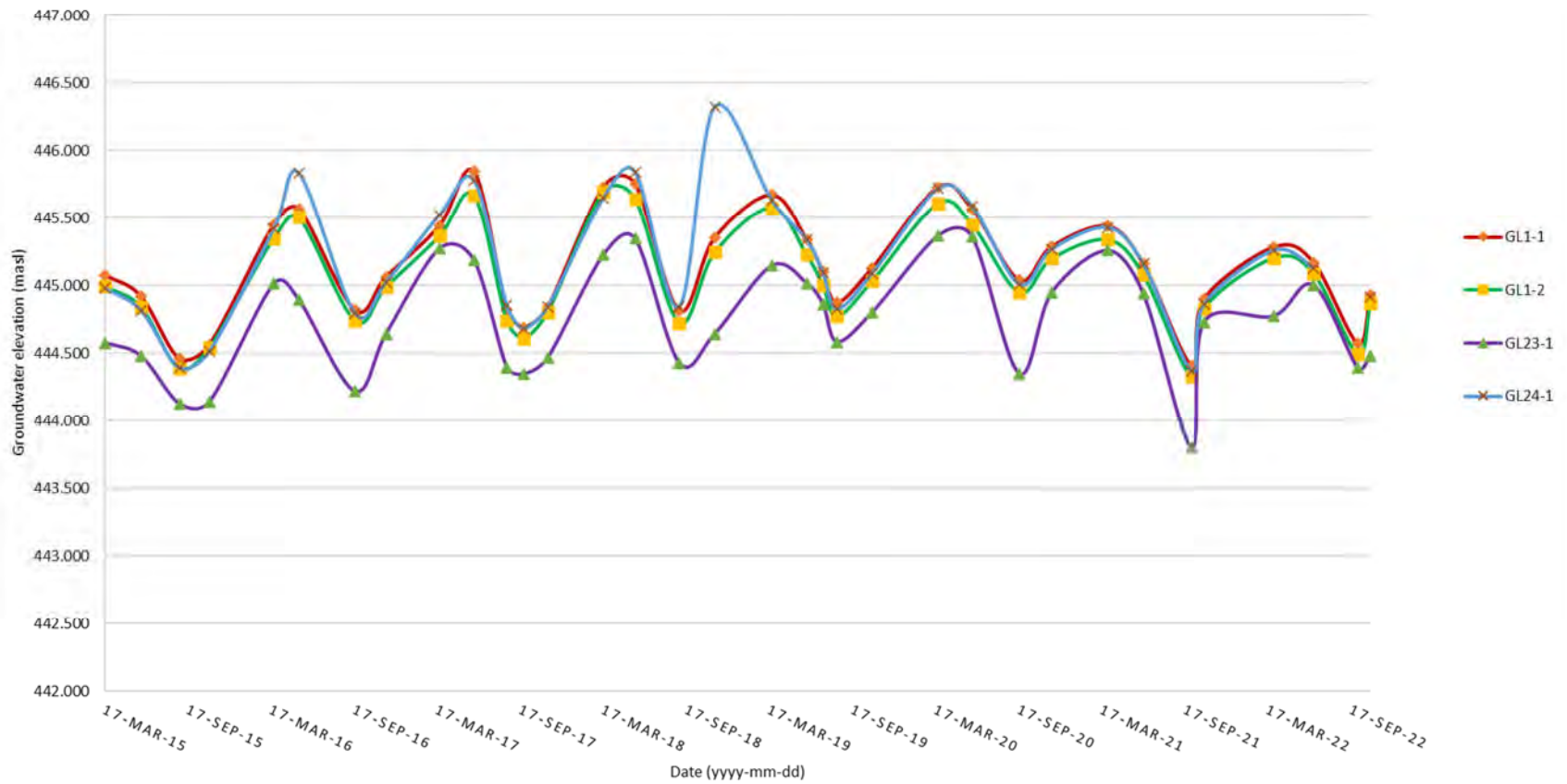


FIGURE 5B - WATER ELEVATIONS NORTHWEST

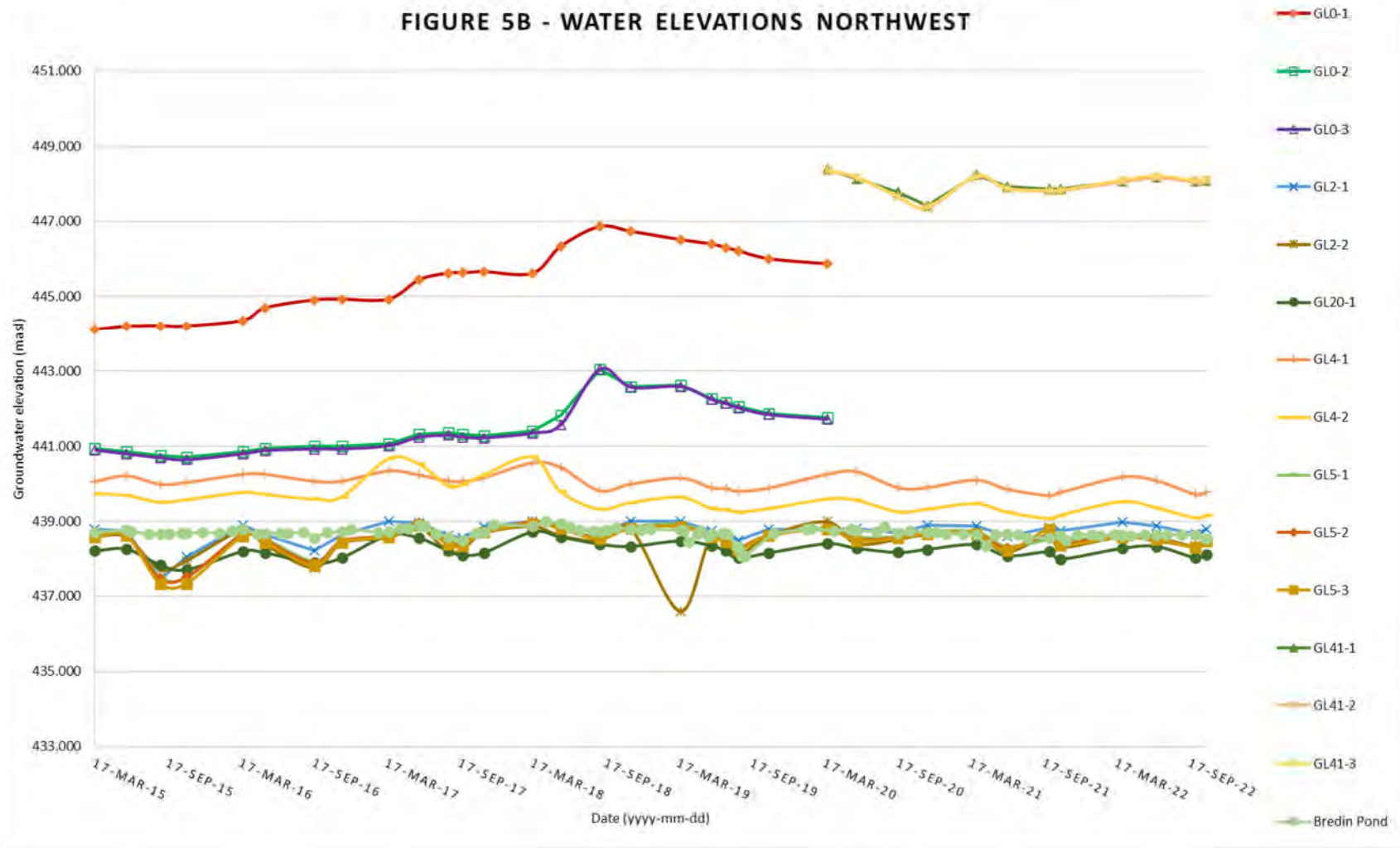


FIGURE 5C - WATER ELEVATIONS CENTRE A

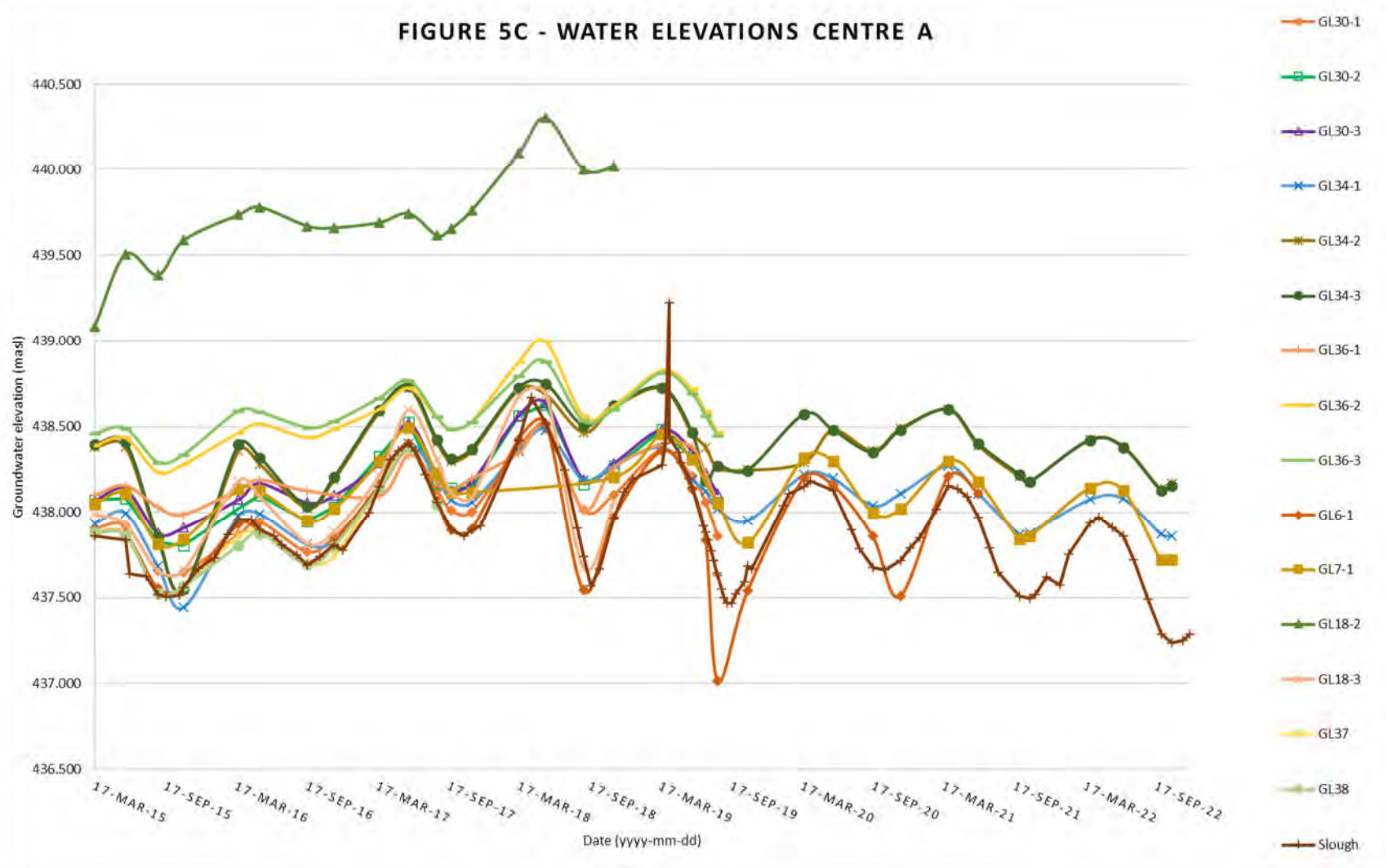


FIGURE 5D - WATER ELEVATIONS CENTRE B

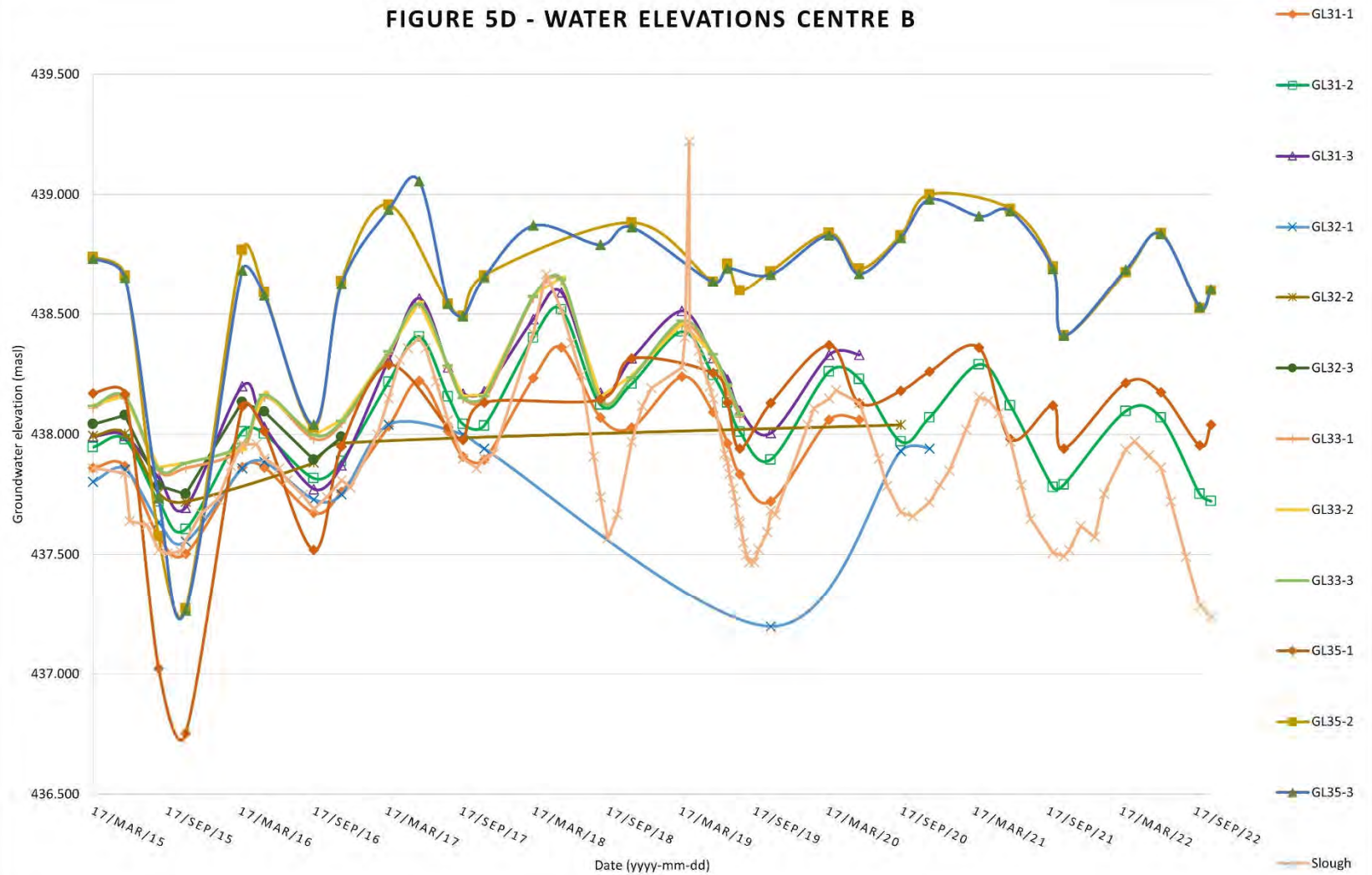


FIGURE 5E - WATER ELEVATIONS SOUTH END

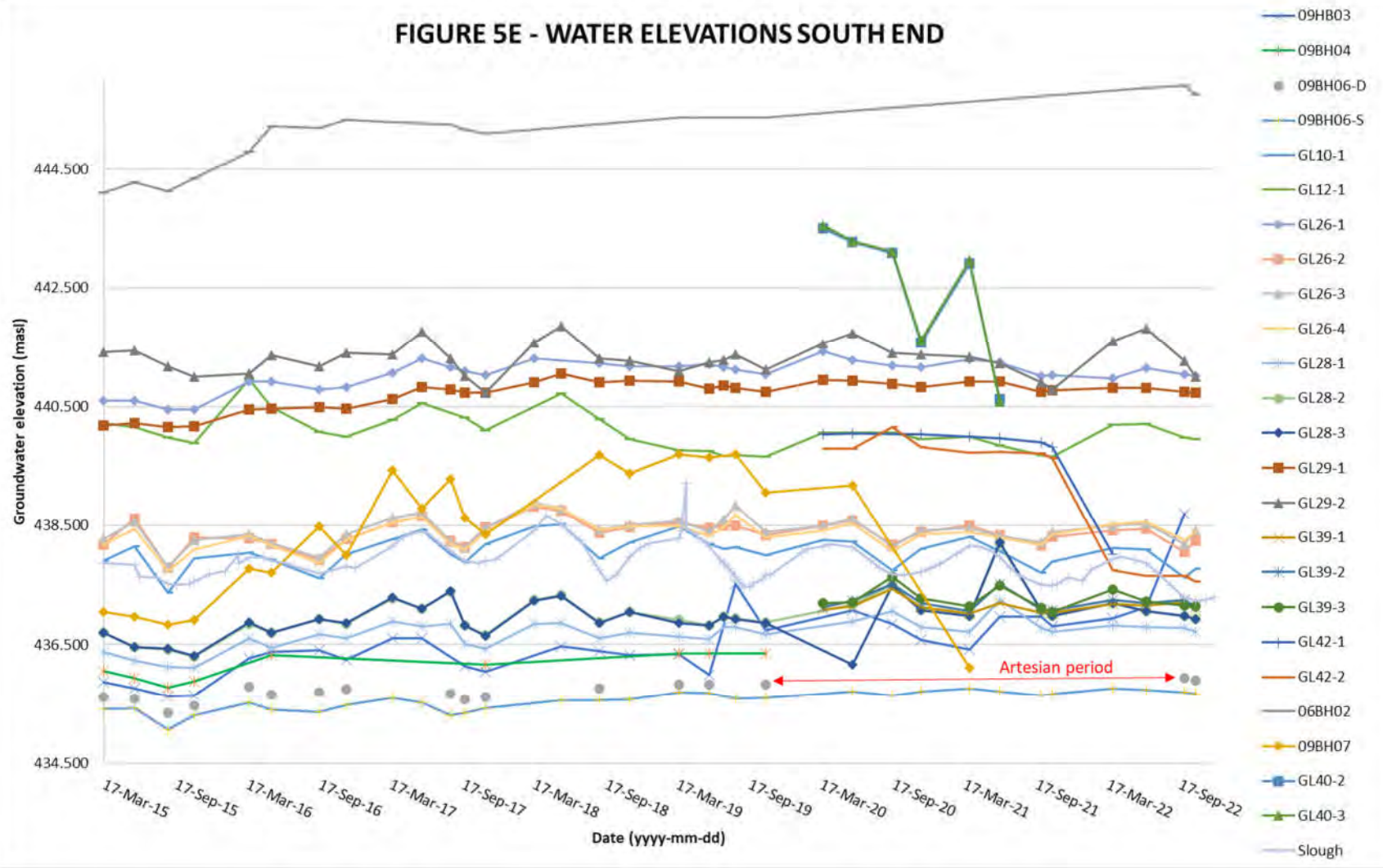


FIGURE 5F- WATER ELEVATIONS CENTRE WEST

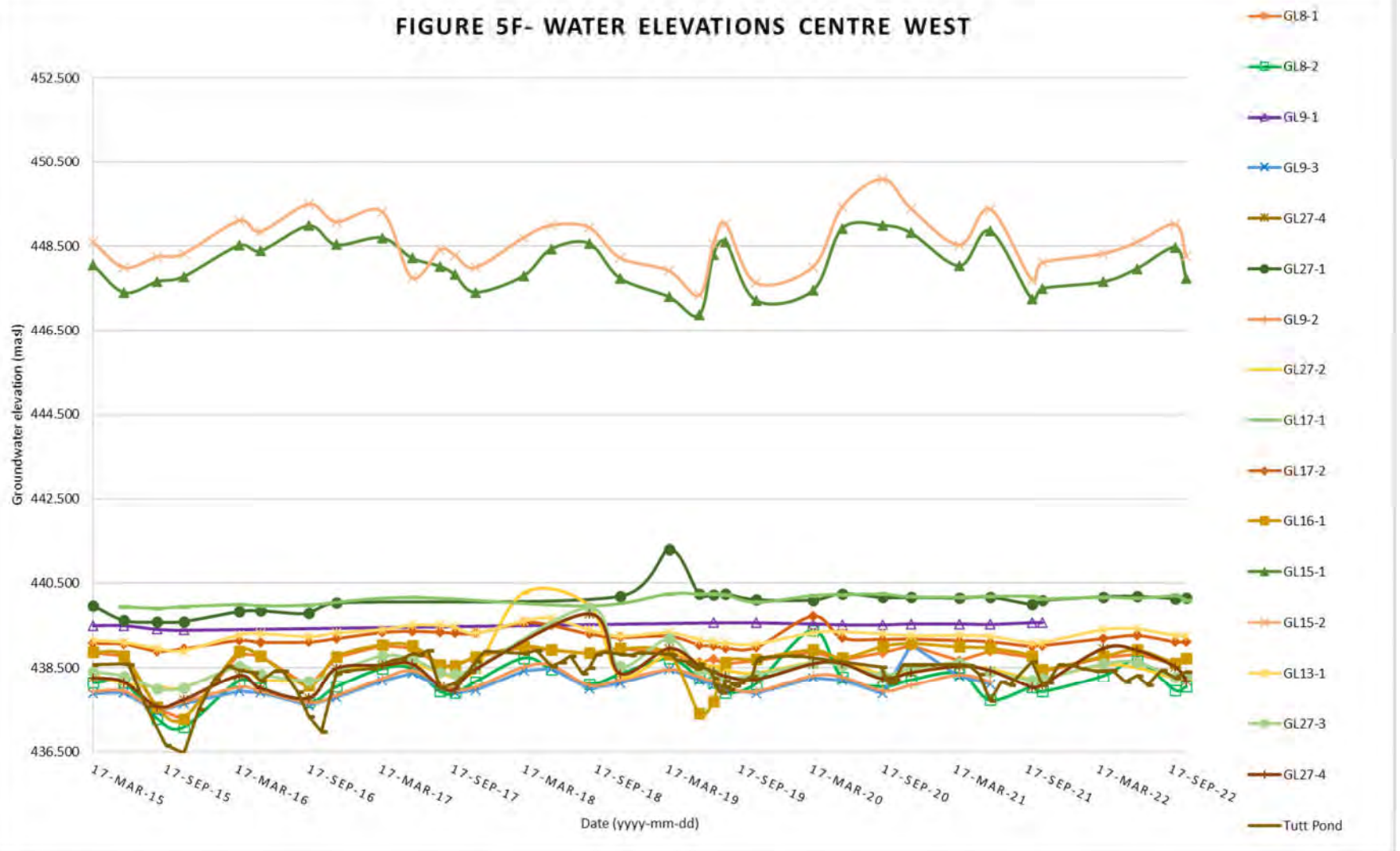


FIGURE 6A. CONCENTRATIONS OF CHLORIDE IN WELLS ACROSS THE SITE

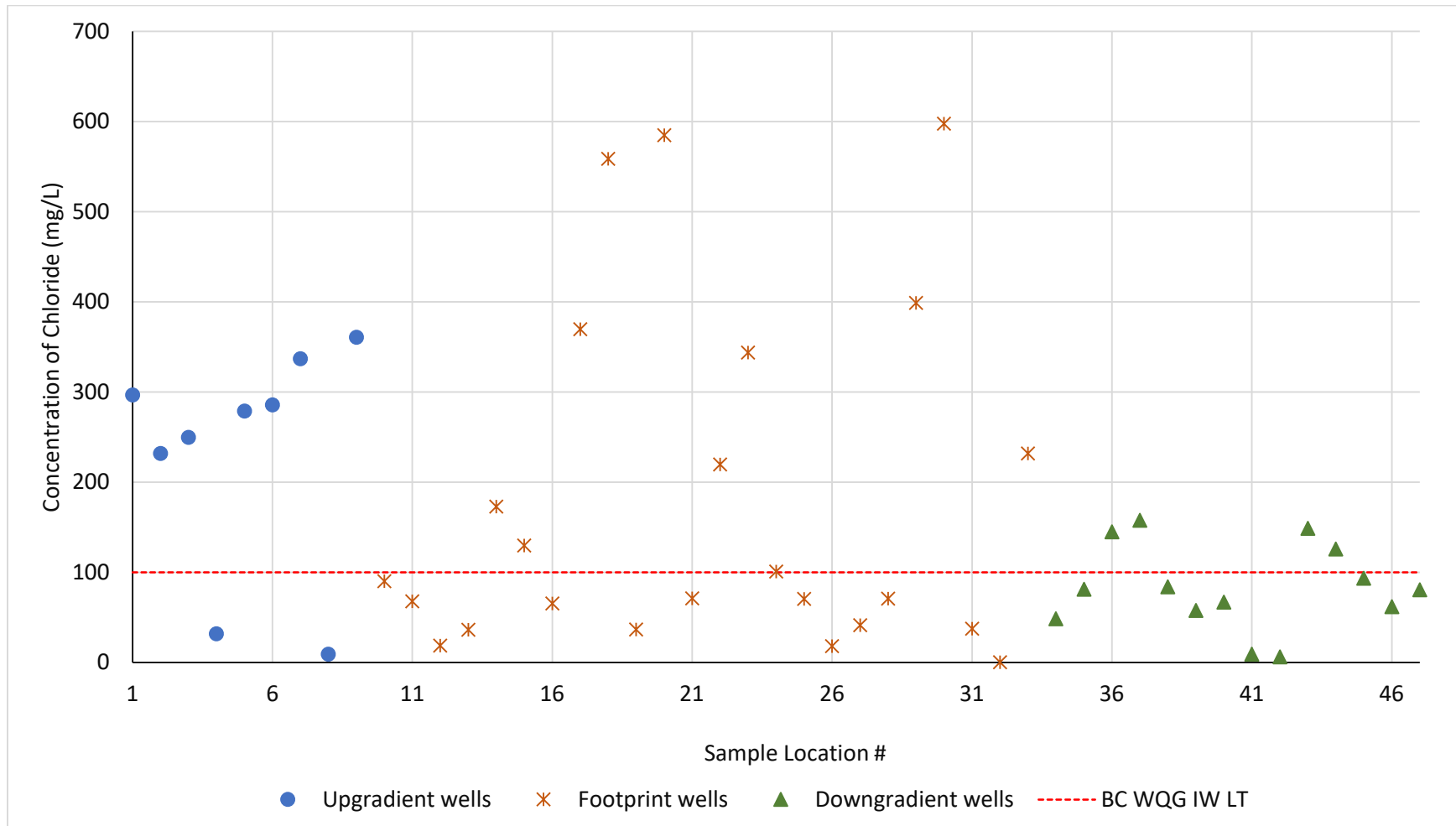


FIGURE 6B. CONCENTRATIONS OF COD IN WELLS ACROSS THE SITE

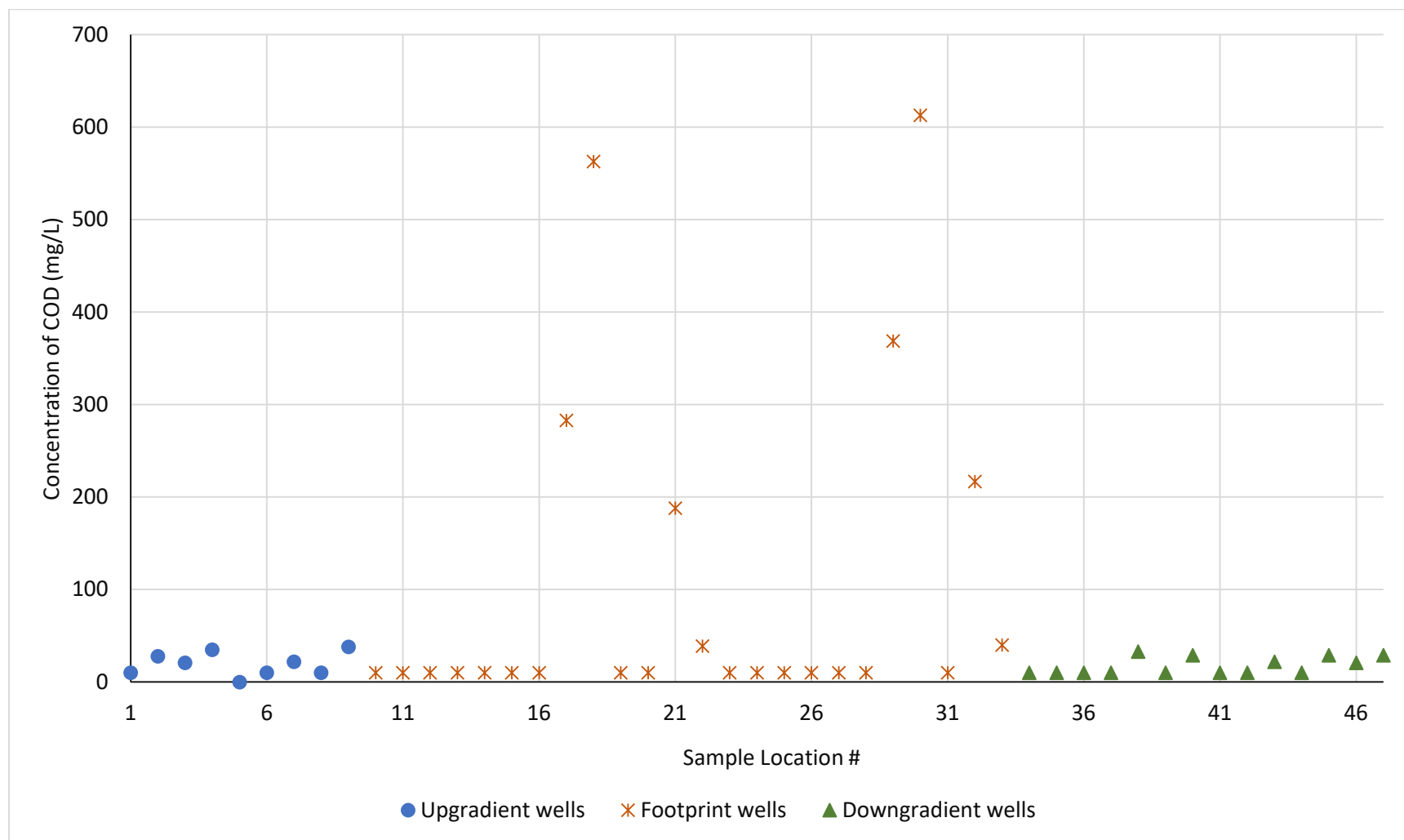


FIGURE 6C. CONCENTRATIONS OF TDS IN WELLS ACROSS THE SITE

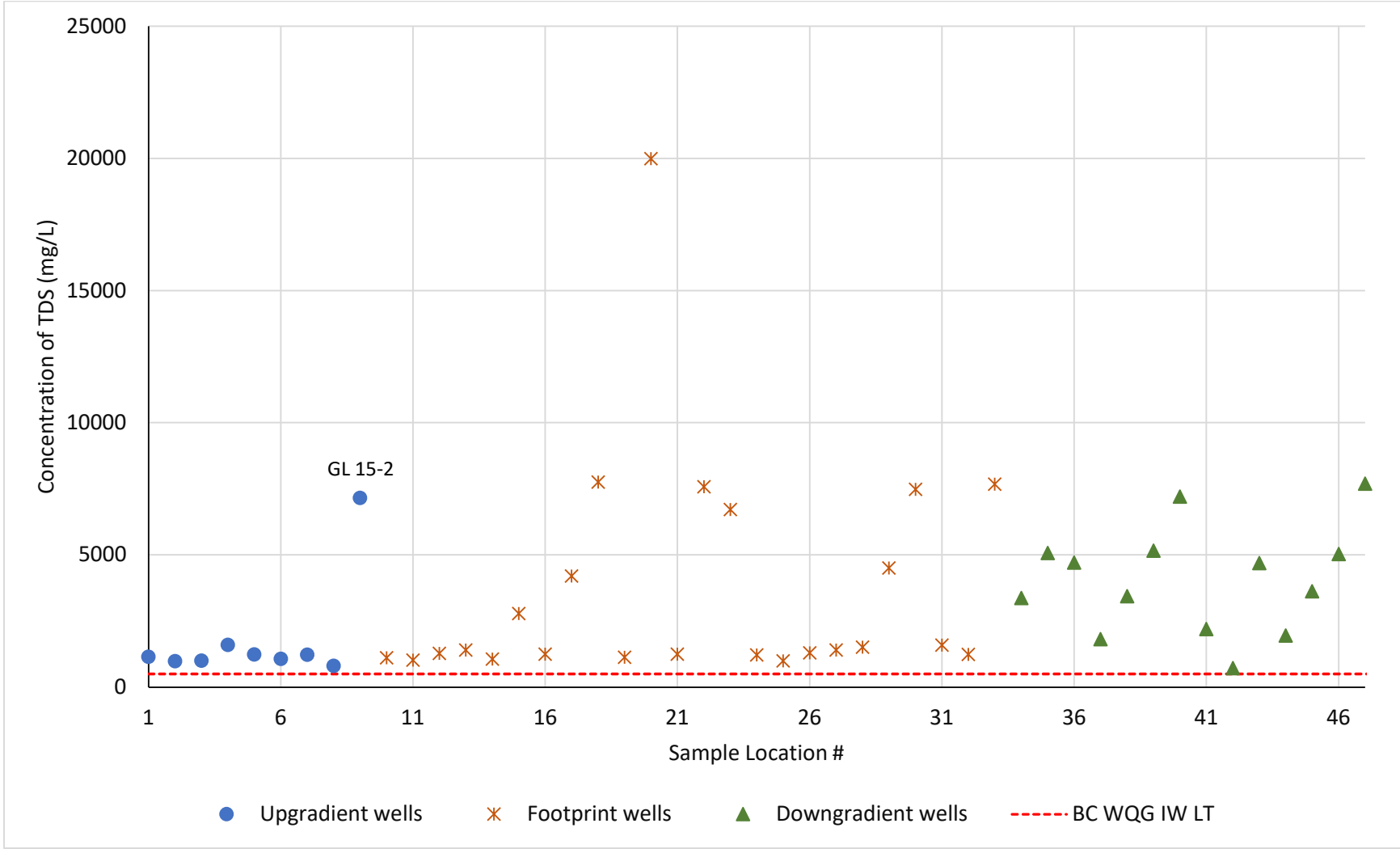


FIGURE 6D. CONCENTRATIONS OF ALKALINITY IN WELLS ACROSS THE SITE

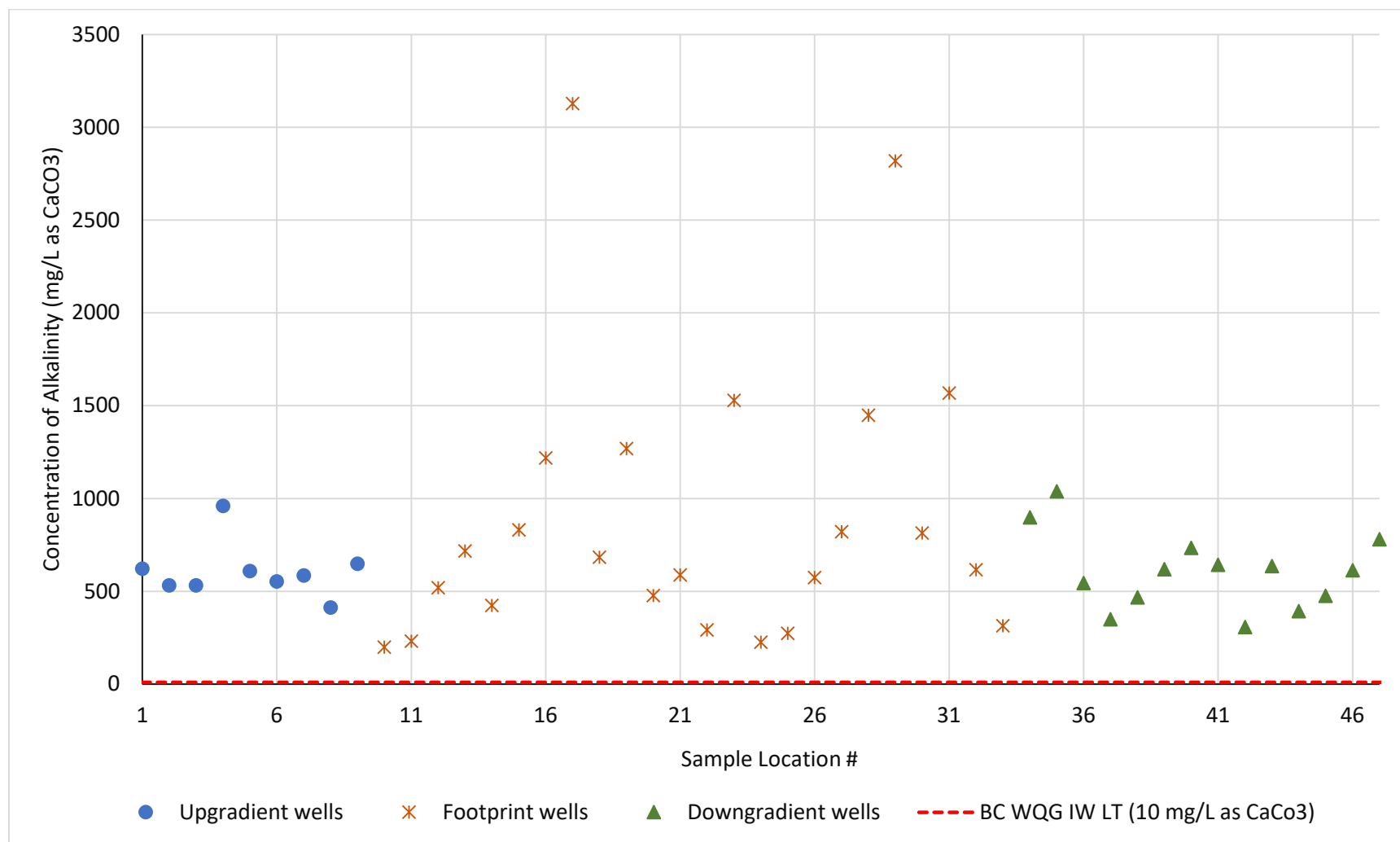


FIGURE 7A. CONCENTRATIONS OF CHLORIDE IN SURFACE WATER BODIES ACROSS THE SITE

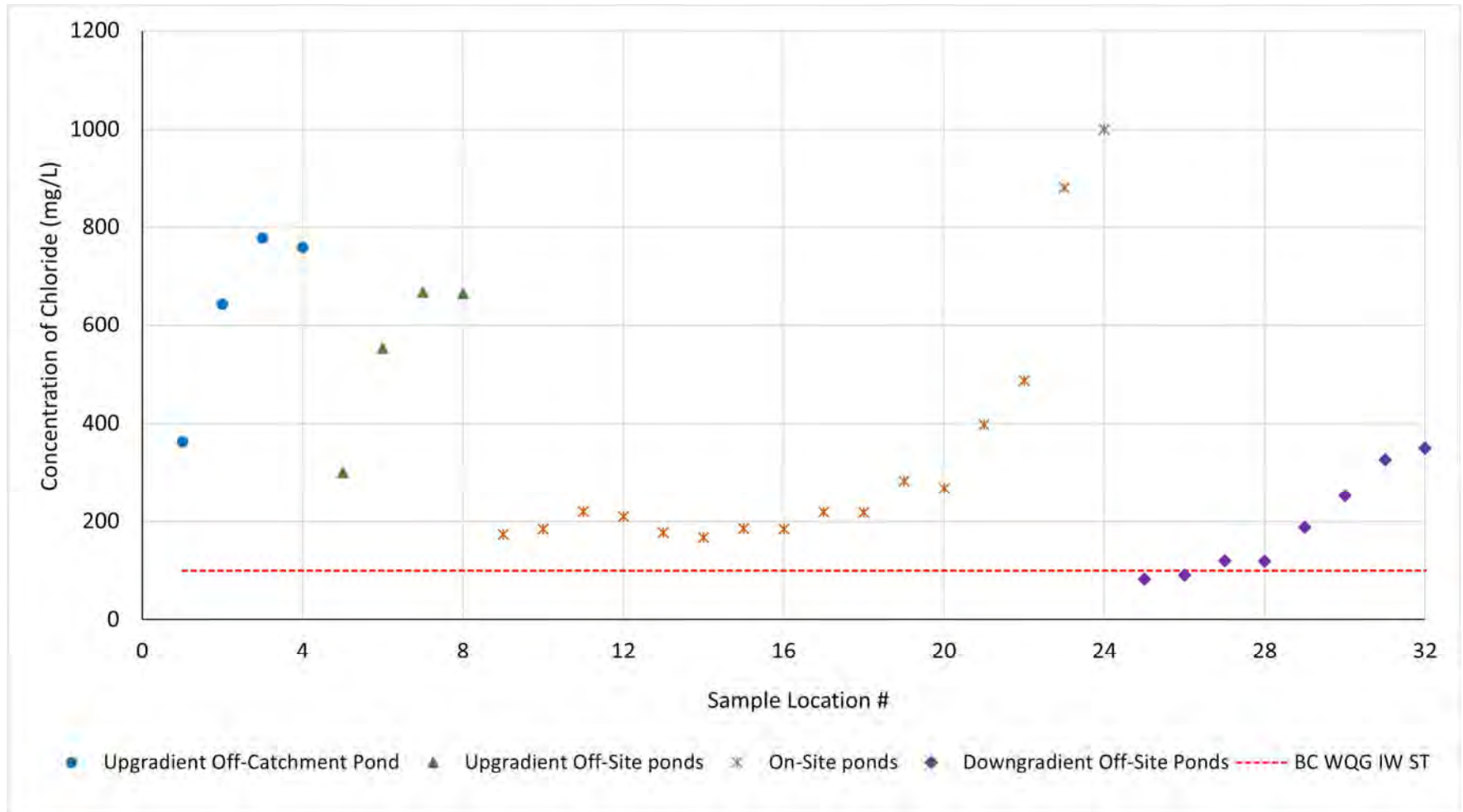


FIGURE 7B. CONCENTRATIONS OF TDS IN SURFACE WATER BODIES ACROSS THE SITE

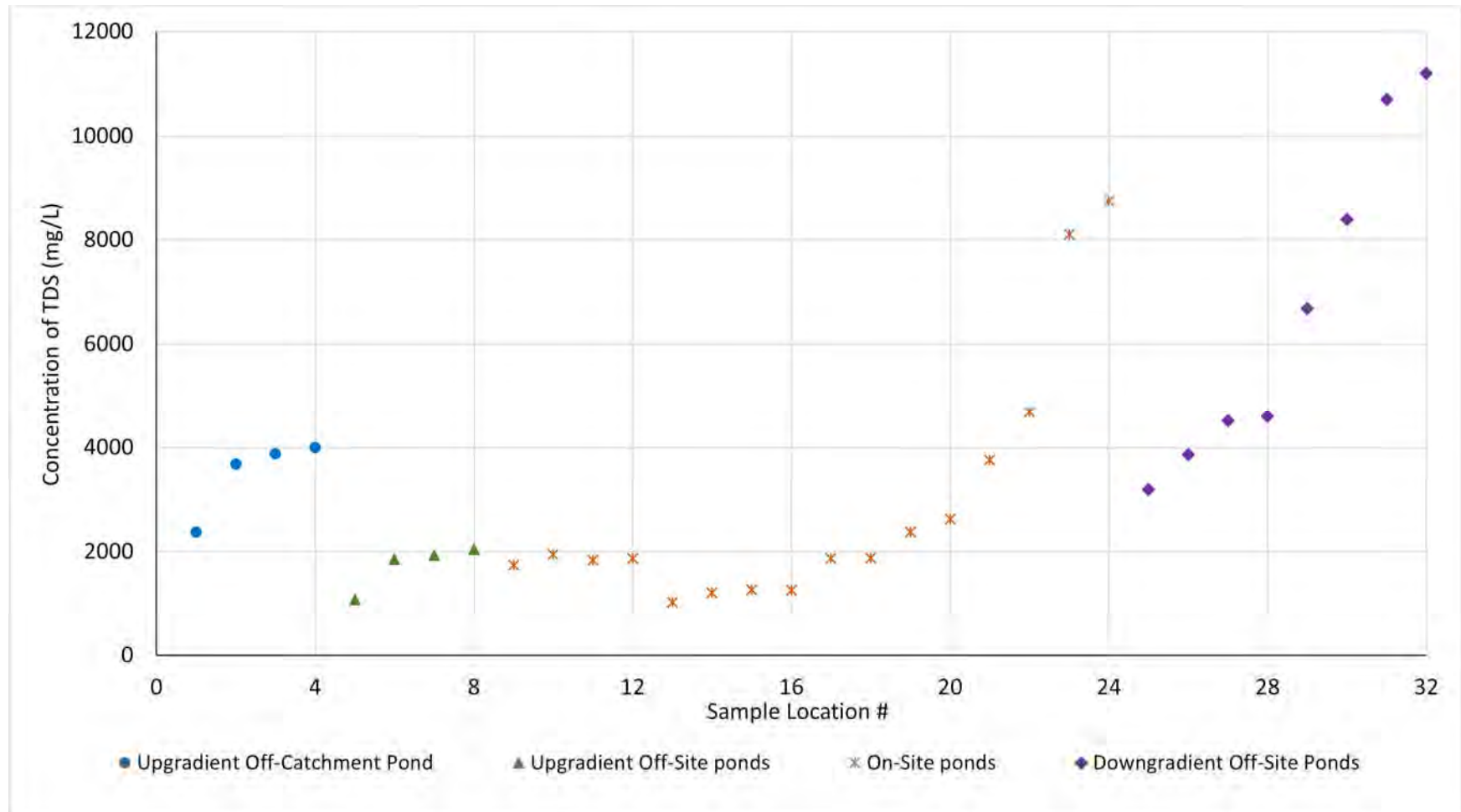


FIGURE 7C. CONCENTRATIONS OF COD IN SURFACE WATER BODIES ACROSS THE SITE

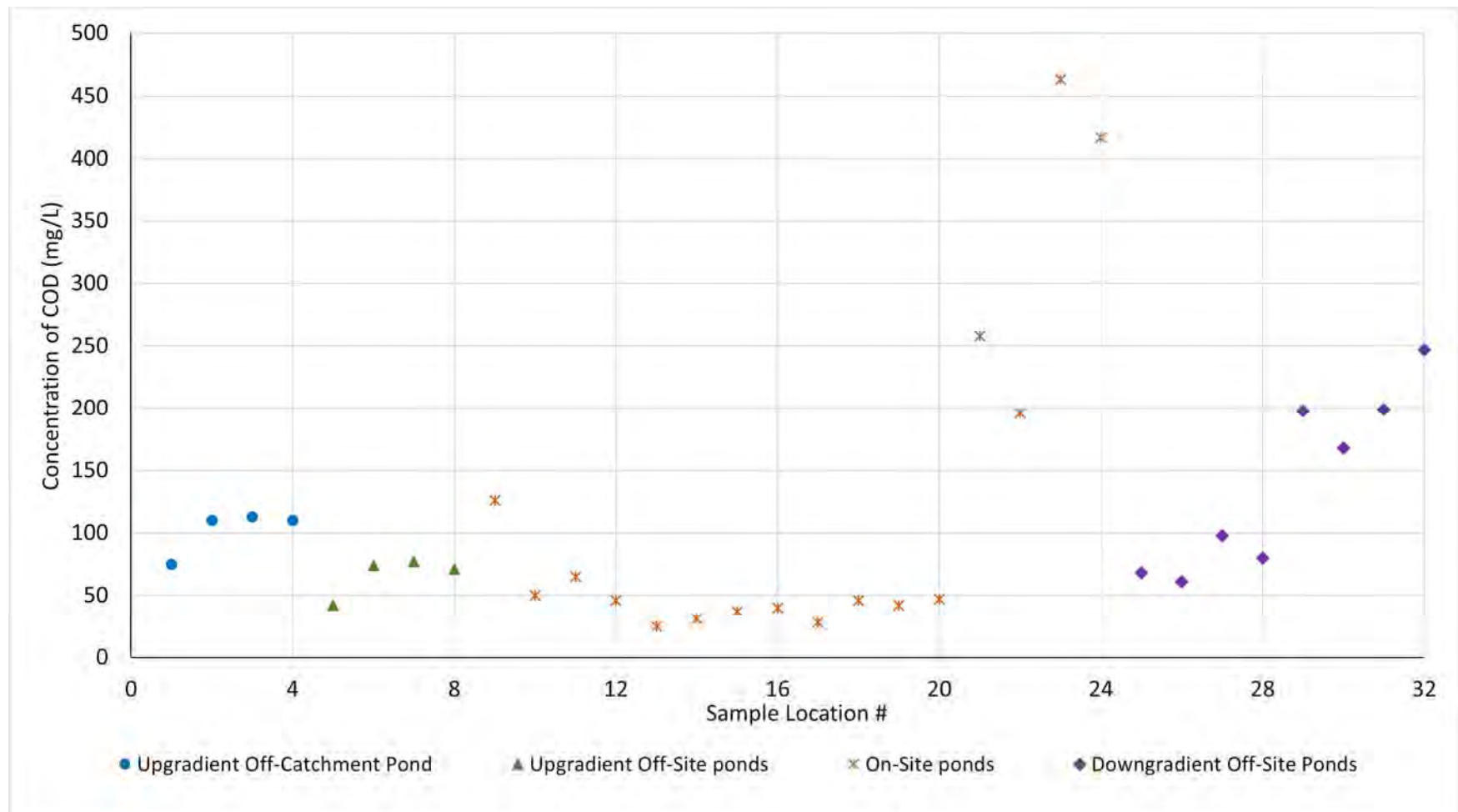


FIGURE 7D. CONCENTRATIONS OF ALKALINITY IN SURFACE WATER BODIES ACROSS THE SITE

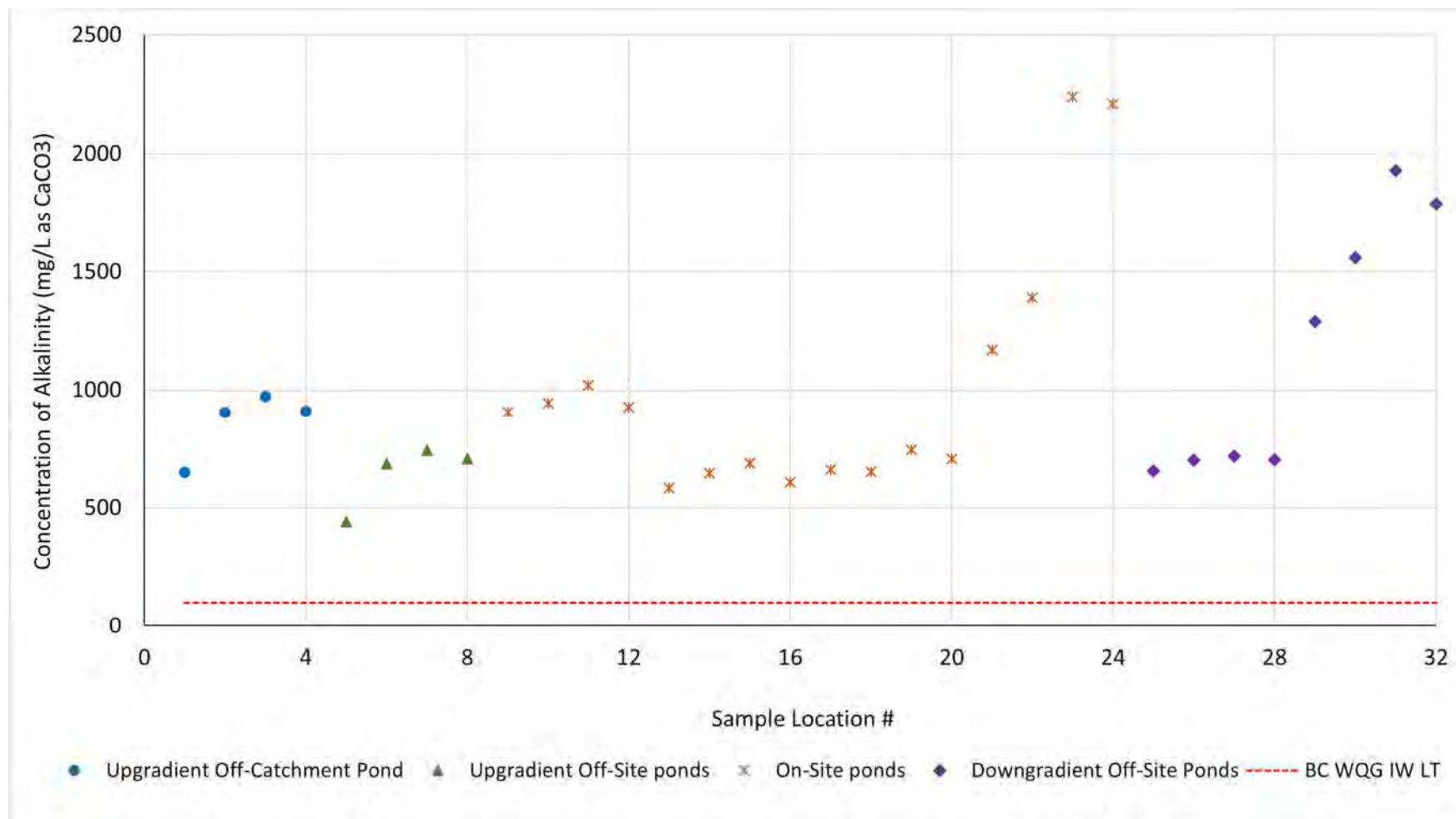


FIGURE 7E. CONCENTRATIONS OF AMMONIA IN SURFACE WATER BODIES ACROSS THE SITE

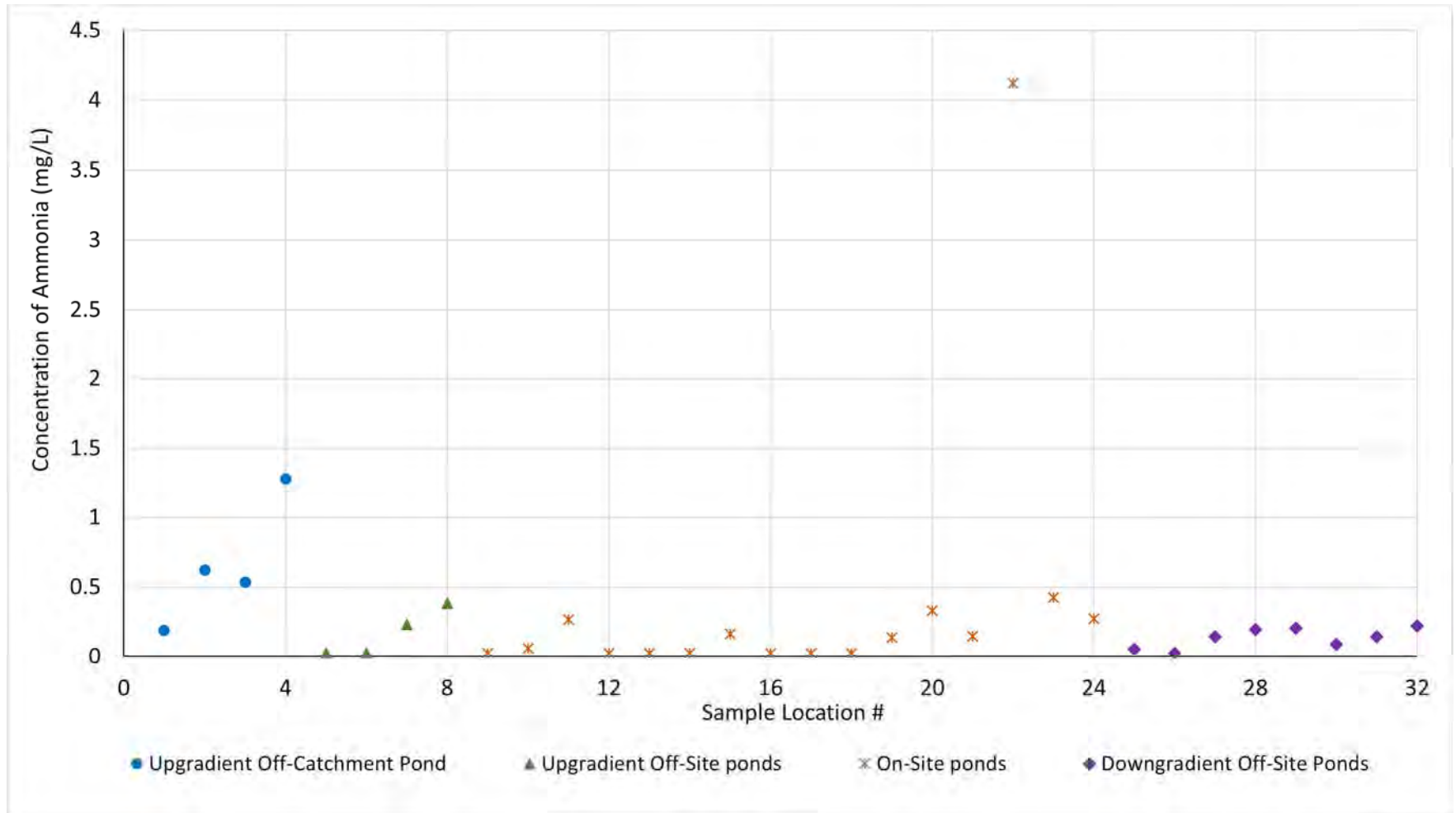
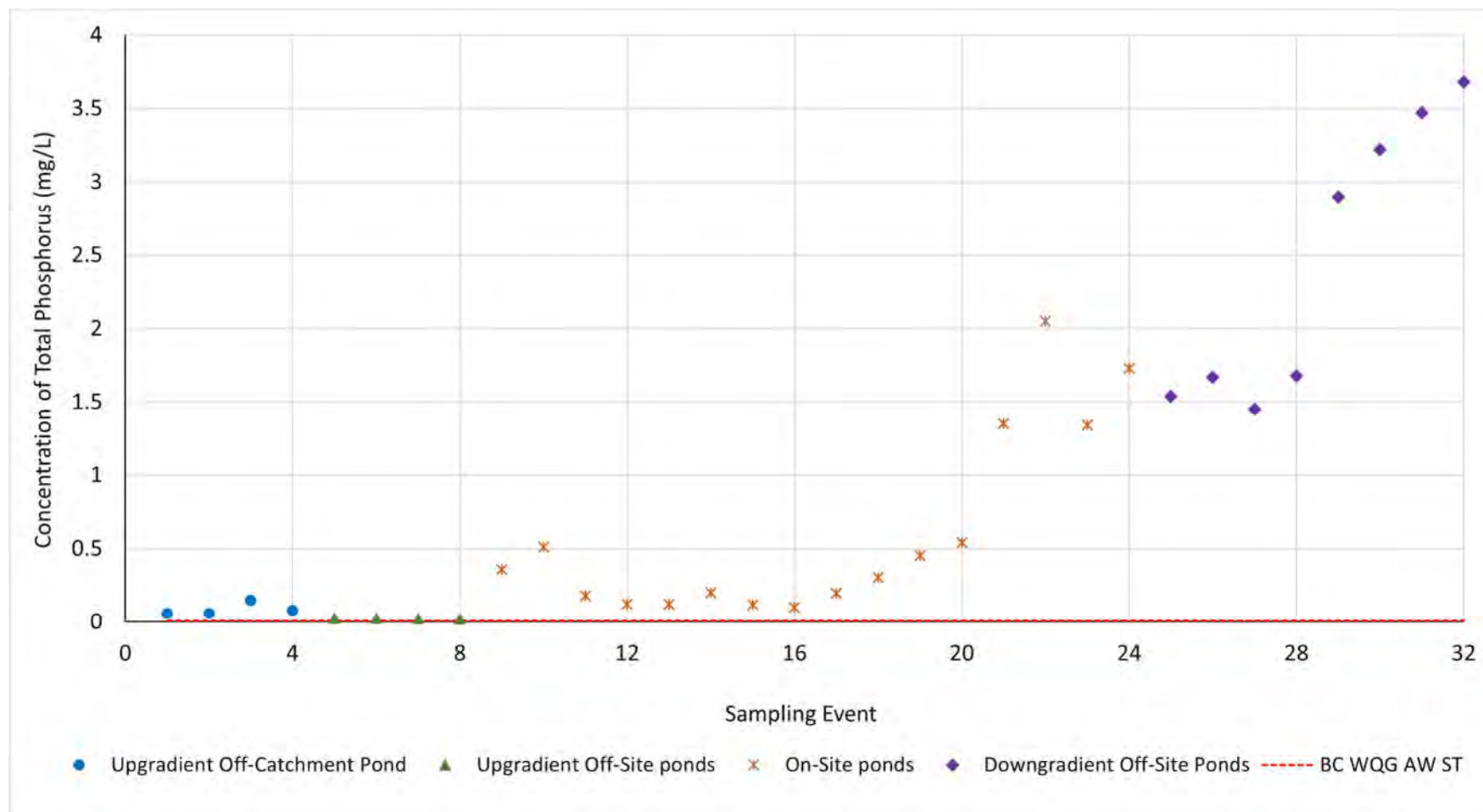


FIGURE 7F. CONCENTRATIONS OF TOTAL PHOSPHORUS IN SURFACE WATER BODIES ACROSS THE SITE



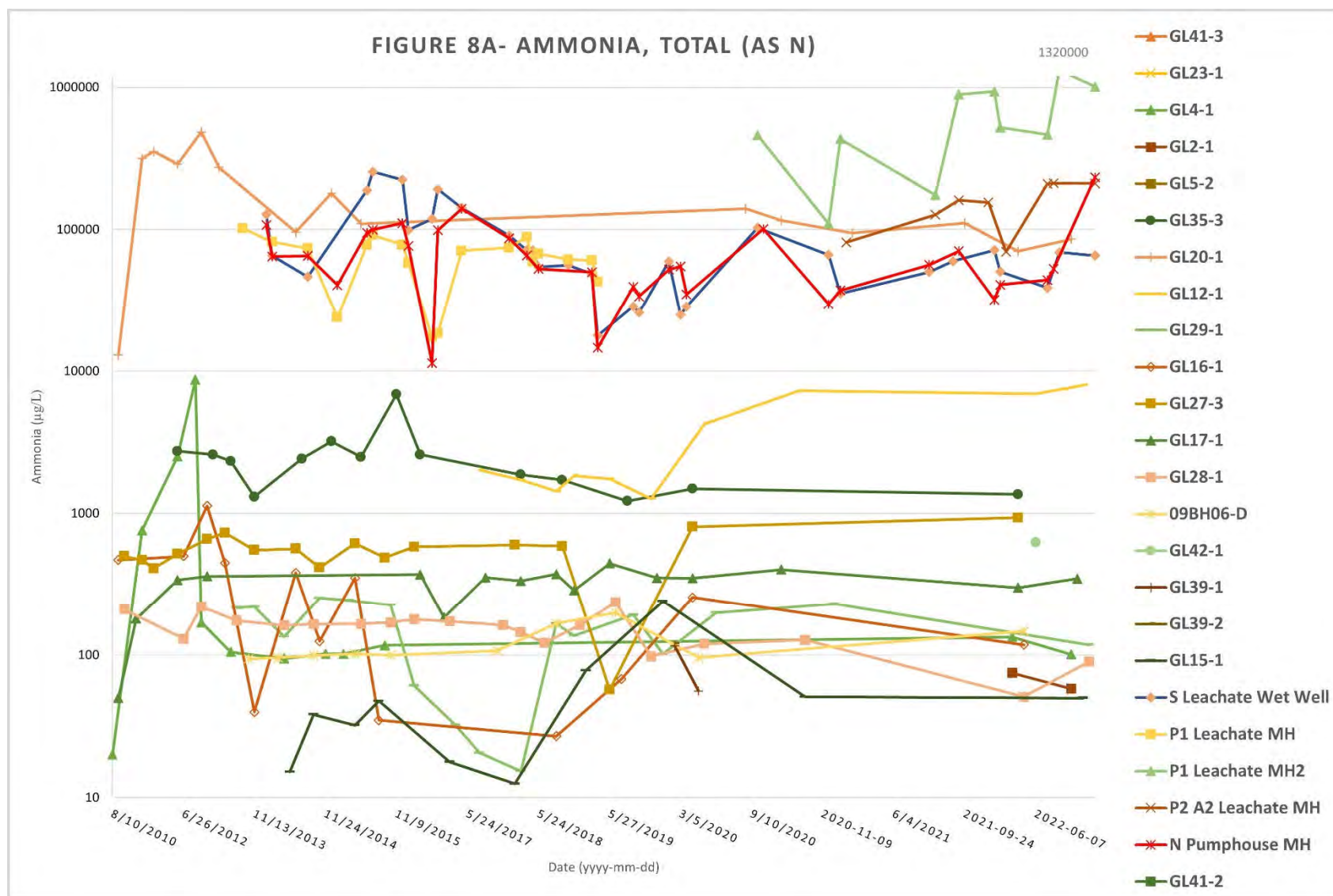


Figure 8A. Historical Trend of Ammonia in Monitoring Wells and Leachate Manholes

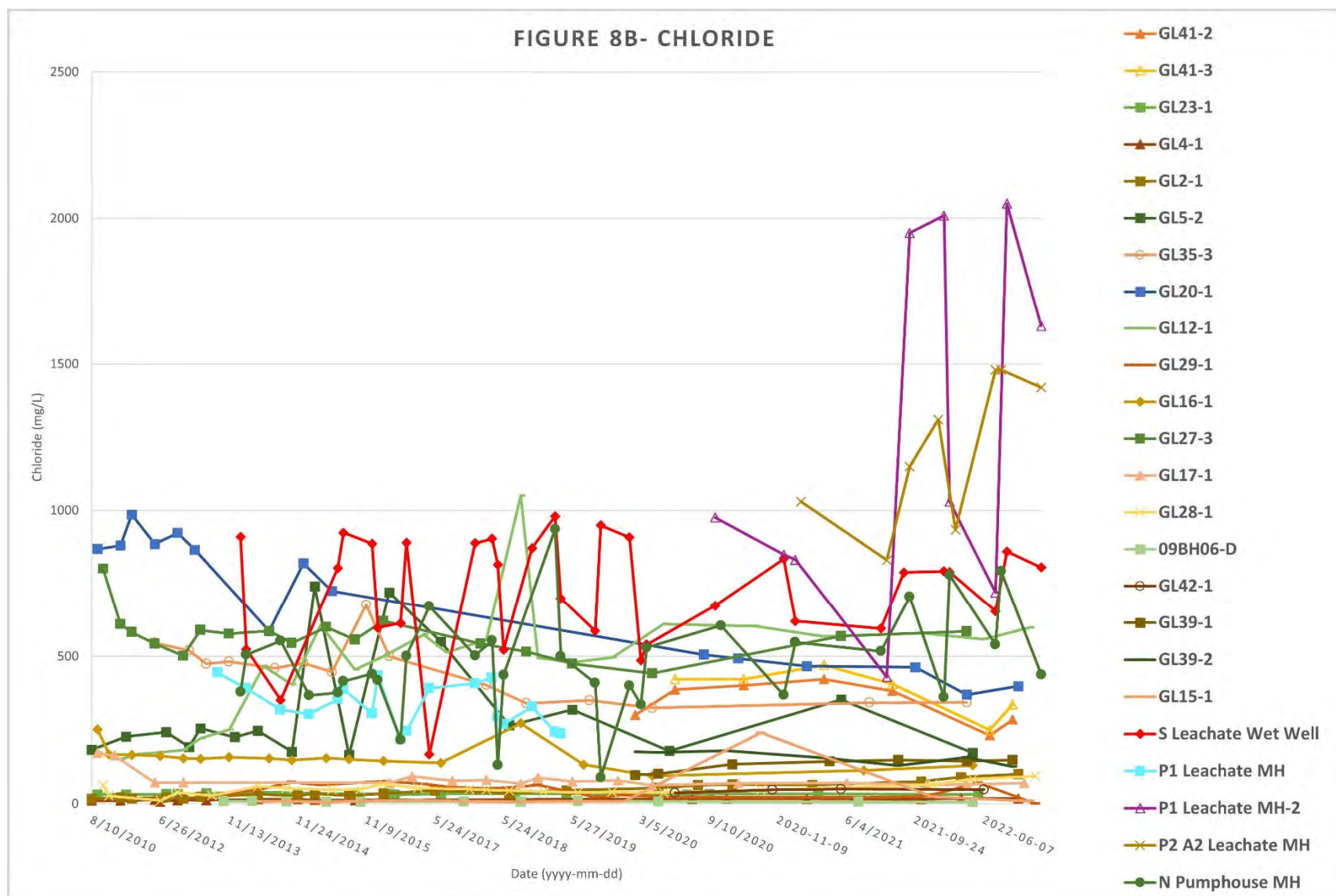


Figure 8B. Historical Trend of Chloride Concentrations in Monitoring Wells and Leachate Manholes

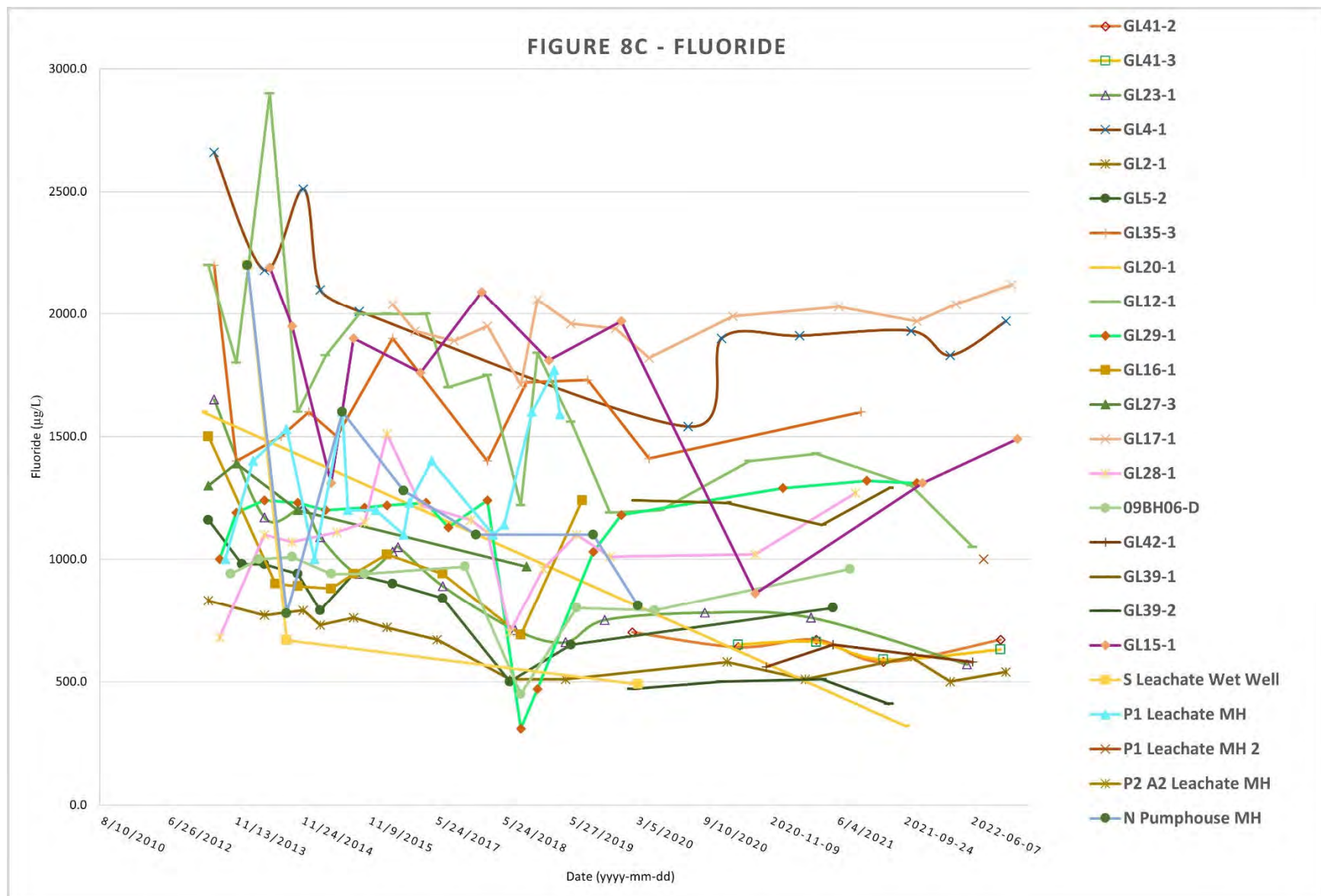


Figure 8C. Historical Trend of Fluoride Concentrations in Monitoring Wells and Leachate Manholes

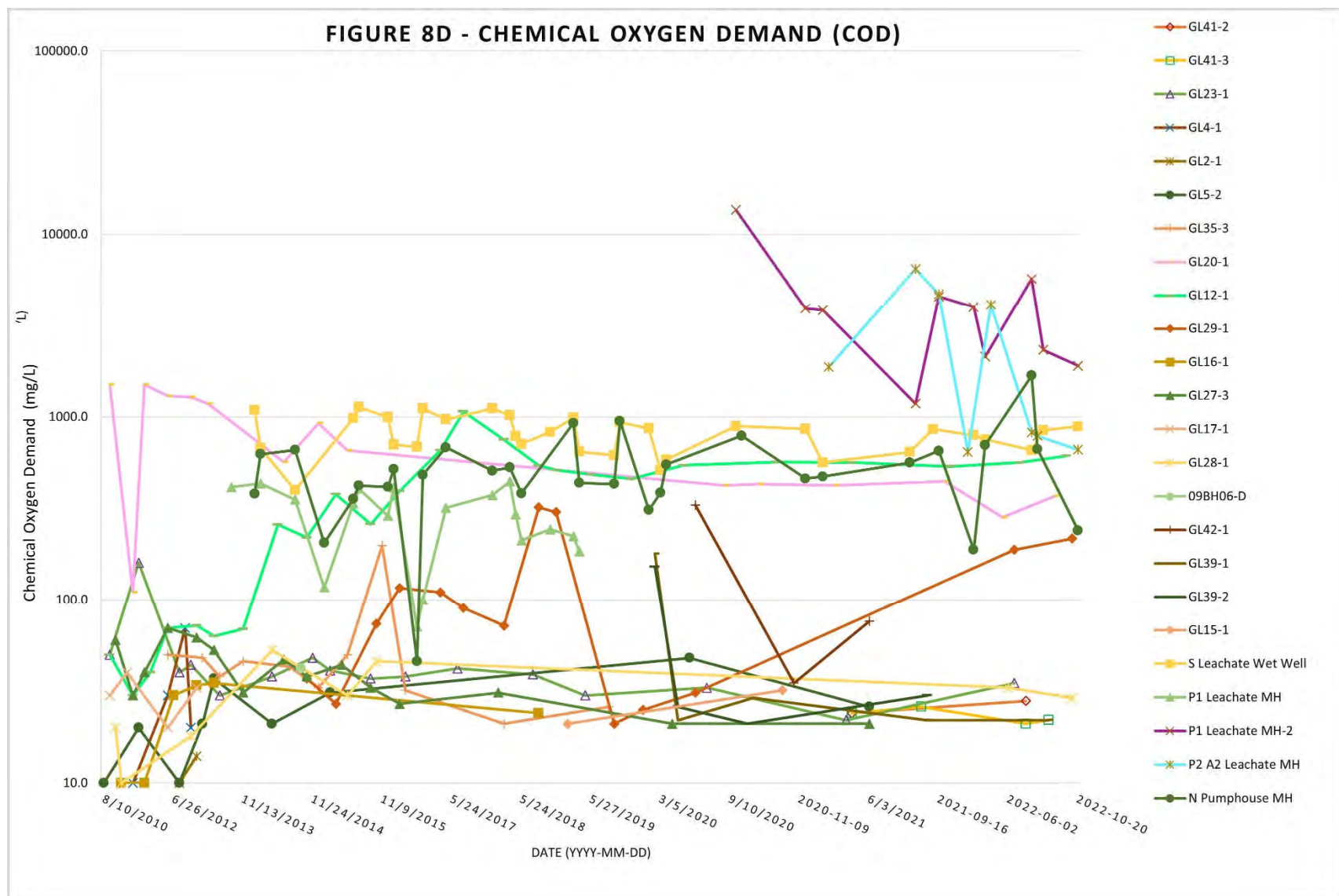


Figure 8D. Historical Trend of Chemical Oxygen Demand in Monitoring Wells and Leachate Manholes

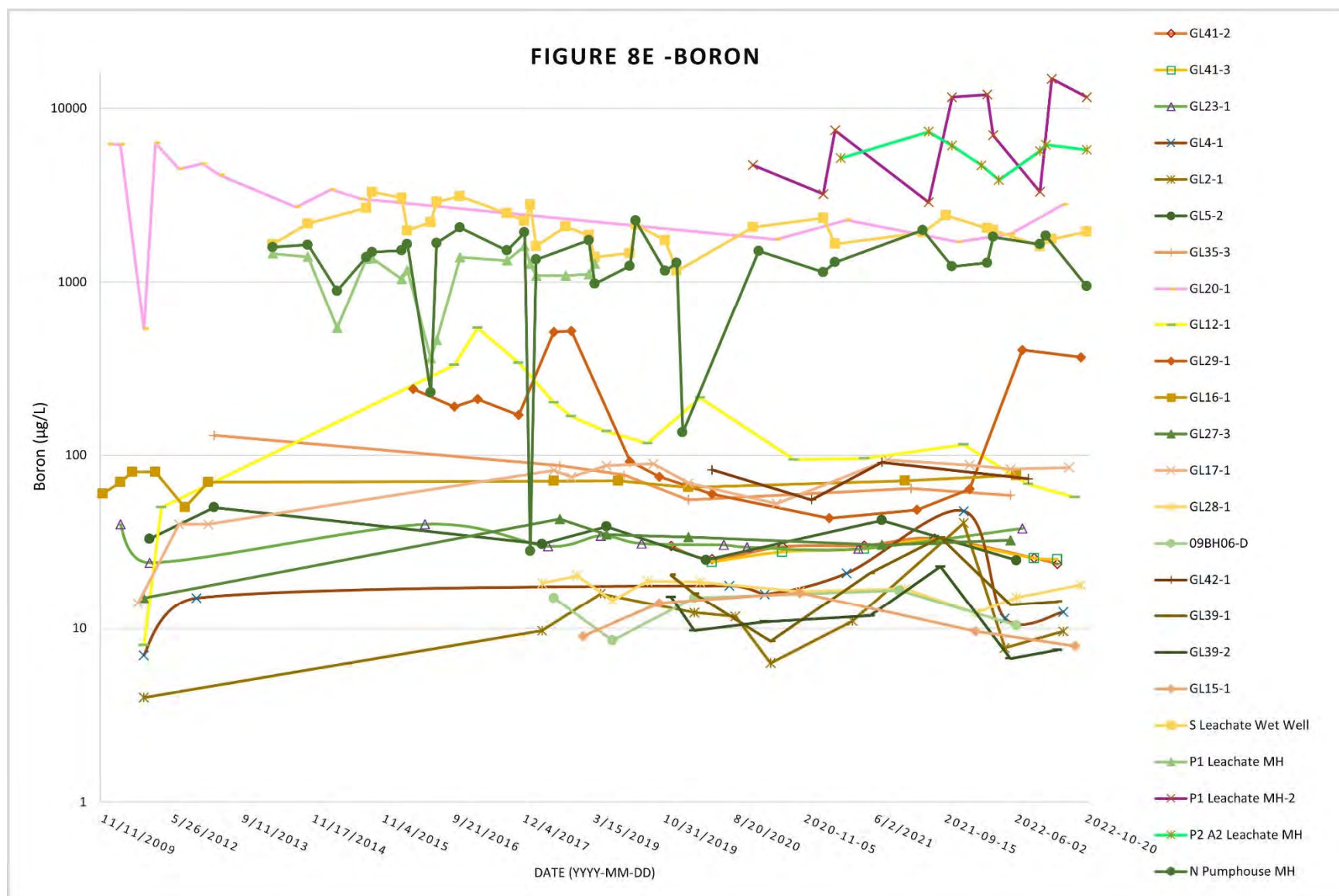


Figure 8E. Historical Trend of Boron Concentrations in Monitoring Wells and Leachate Manholes

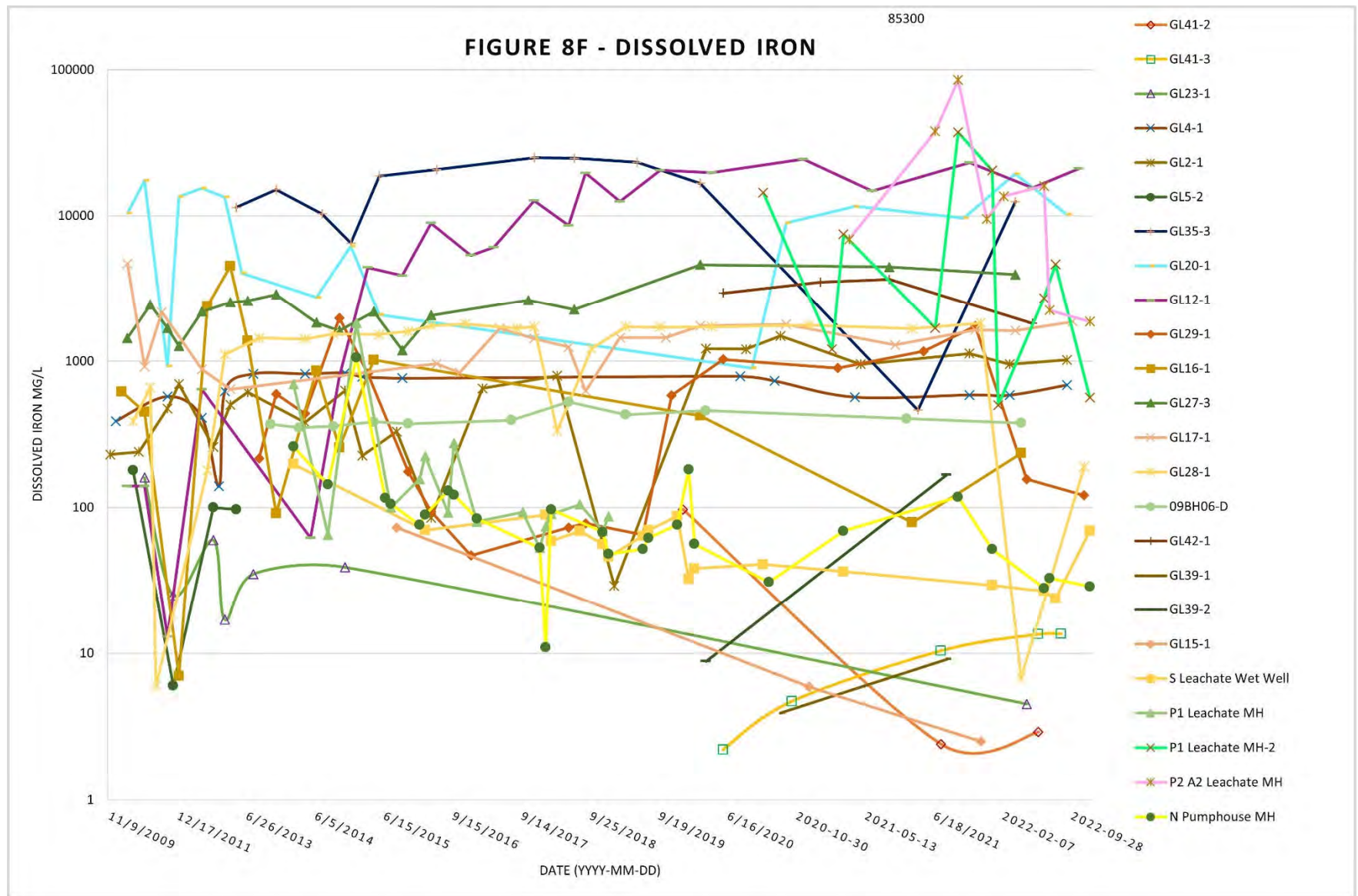


Figure 8F. Historical Trend of Dissolved Iron Concentrations in Monitoring Wells and Leachate Manholes

Table 1: Detailed Monitoring Well Construction and Current Status

City's Current Monitoring Well ID*	Consultant Initial Monitoring Well ID*	Monitoring Well		Geodetic Elevations				Screen Details				Drilling				Current Status
		UTM Coordinates		Grade	Piezo	Top of screen	Bottom of Screen	Top of Screen	Bottom of Screen	Screen Length	Lithology	Method	Company	Consultant	Year	
		Northing	Easting	(m msl)	(m msl)	(m msl)	(m msl)	(m bgs)	(m bgs)	(m bgs)						
North and North East of Phase 1																
GL41-1	GL41-1	5537673.4	326191.3	449.7	450.6	440.6	439.0	9.1	10.7	1.6	volcanic bedrock, brown, hard	Sonic Core	VanMars	SNC Lavalin	2019	Active
GL41-2	GL41-2	5537673.3	326191.5	449.7	450.6	443.3	442.4	6.4	7.3	0.9	gravel and silt, trace clay (till)	Sonic Core	VanMars	SNC Lavalin	2019	Active
GL41-3	GL41-3	5537675.7	326192.7	449.7	450.6	447.0	445.5	2.7	4.2	1.5	silt, some clay followed by sand, trace silt	HSA	On the Mark	SNC Lavalin	2019	Active
GL0-1	12-1A	5537338.6	326498.8	449.2	450.0	429.1	426.0	20.1	23.2	3.1	sandy clay (till) followed by bedrock	Sonic Core	MudBay	SLR	2012	Decomm in September 2020
GL0-2	12-1B	5537338.6	326498.8	449.0	450.0	435.0	431.9	14.0	17.1	3.1	sandy silt, some gravel (suspect till) followed by sand and silt, some clay, trace gravel	Sonic Core	MudBay	SLR	2012	Decomm in September 2020
GL0-3	12-1C	5537338.6	326498.8	449.42	450.49	439.9	436.9	9.5	12.5	3.0	sand and gravel followed by sand, trace silt and gravel	Sonic Core	MudBay	SLR	2012	Decomm in September 2020
GL23-1	GL23-1	5537307.3	326976.6	446.0	446.6	437.8	436.3	8.2	9.7	1.5	sand, compact	HSA	Beck	Golder	2007	Active
GL24-1	GL24-1	5537291.1	327107.7	446.8	447.6	443.6	441.6	3.2	5.2	2.0	sand, compact followed by silty sand (till)	HSA	Beck	Golder	2007	Active
GL1-1	GL1-1	5537230.4	327134.1	446.3	446.9	435.8	434.3	10.5	12.0	1.5	silt, some gravel (till)	HSA	-	Gartner Lee	1990	Active
GL1-2	GL1-2	5537230.4	327134.1	446.3	447.0	443.8	440.3	2.5	6.0	3.5	silty sand followed by sand	HSA	-	Gartner Lee	1990	Active
GL22-1	GL22-1	5537429.7	326934.5	449.4	450.3	438.2	436.6	11.2	12.8	1.6	sand, trace silt	HSA	Beck	Golder	2007	Decomm in Sept/Oct 2016
Phase 1																
GL3-5	12-14	5537050.6	326414.3	457.1	457.4	435.5	433.9	21.6	23.2	1.6	sand and gravel followed by silty clay with sand	Sonic Core	MudBay	SLR	2012	Decomm in 2017
GL3-1	GL3-1	5537029.2	326492.0	-	-	-	-	?	46.9	-	volcanic bedrock	Air Rotary	-	Gartner Lee	1990	Decomm in May 2011
GL3-2	GL3-2	5537029.2	326492.0	-	-	-	-	16.8	18.5	1.7	silty sand some gravel (till)	HSA	-	Gartner Lee	1990	Decomm in May 2011
GL3-3	GL3-3	5537029.2	326492.0	-	-	-	-	0.5	3.5	3.0	fill followed by silty clay	HSA	-	Gartner Lee	1990	Decomm in May 2011
Phase 2																
GL6-1 (2011)	GL6-1 (2011)	5536528.3	326582.8	439.7	440.5	437.9	434.8	1.8	4.9	3.1	Interbedded clay and garbage (municipal solid waste)	Sonic Core	Beck	SLR	2011	Decomm in September 2021
GL18-1	GL18-1	5536537.1	326574.7	-	-	-	-	>24	-	-	bedrock	Sonic Core	Beck	SLR	2011	Decomm in May 2011
GL18-2	GL18-2	5536537.1	326574.7	442.6	442.9	426.4	423.4	16.2	19.2	3.0	silty sand	Mud Rotary	Foundex	Golder	2005	Decomm in January 2019
GL18-3	GL18-3	5536537.1	326574.7	442.9	442.8	437.5	434.6	5.4	8.3	2.9	landfill refusal	Mud Rotary	Foundex	Golder	2005	Decomm in January 2020
West of Phase 2																
GL2-1	GL2-1	5536880.9	326219.1	438.6	439.0	430.6	429.1	8.0	9.5	1.5	silty clay followed by silty sand	HSA	-	Gartner Lee	1990	Active
GL2-2	GL2-2	5536880.9	326219.1	438.9	439.0	436.4	432.9	2.5	6.0	3.5	silty clay	HSA	-	Gartner Lee	1990	Active
GL5-1	GL5-1	5536592.3	326175.4	439.0	440.0	421.0	420.0	18.0	19.0	1.0	crystalline bedrock	Air Rotary	-	Gartner Lee	1990	Active
GL5-2	GL5-2	5536592.3	326175.4	439.2	440.1	431.7	429.2	7.5	10.0	2.5	sand followed by gravelly silt (till)	HSA	-	Gartner Lee	1990	Active
GL5-3	GL5-3	5536592.3	326175.4	439.2	440.2	437.2	434.2	2.0	5.0	3.0	silty clay	HSA	-	Gartner Lee	1990	Active

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City's Current Monitoring Well ID*	Consultant Initial Monitoring Well ID*	Monitoring Well		Geodetic Elevations				Screen Details				Drilling				Current Status
		UTM Coordinates		Grade	Piezo	Top of screen	Bottom of Screen	Top of Screen	Bottom of Screen	Screen Length	Lithology	Method	Company	Consultant	Year	
		Northing	Easting	(m msl)	(m msl)	(m msl)	(m msl)	(m bgs)	(m bgs)	(m bgs)						
East of Phase 2																
GL4-1	GL4-1	5536929.9	326887.8	441.1	441.4	433.4	432.4	7.7	8.7	1.0	silty gravel and sand	HSA	-	Gartner Lee	1990	Active
GL4-2	GL4-2	5536929.9	326887.8	441.1	441.4	439.4	435.9	1.7	5.2	3.5	silty clay	HSA	-	Gartner Lee	1990	Active
Phase 3 Slough																
GL34-1	11-26A	5536303.3	326445.5	439.2	440.0	433.2	431.7	6.0	7.5	1.5	fat clay (reworked soil, fill) with 7 cm sand lenses	Sonic Core	Beck	SLR	2011	Active
GL34-2	11-26B	5536303.3	326445.5	439.2	439.7	428.5	427.6	10.7	11.6	0.9	silty sand, clay layers	Sonic Core	Beck	SLR	2011	Active
GL34-3	11-26C	5536303.3	326445.5	439.3	440.1	425.7	424.8	13.6	14.5	0.9	lean clay, trace sand followed by fat clay, trace sand	Sonic Core	Beck	SLR	2011	Active
GL30-1	11-13A1	5536286.0	326746.8	439.2	440.0	432.6	431.1	6.6	8.1	1.5	fat clay (reworked soil, fill) with 10 cm sand lens	Sonic Core	Beck	SLR	2011	Decomm in Oct 2019
GL30-2	11-13B	5536286.0	326746.8	439.4	440.7	427.5	426.6	11.9	12.8	0.9	silty sand followed by fat clay	Sonic Core	Beck	SLR	2011	Decomm in Oct 2019
GL30-3	11-13C	5536286.0	326746.8	439.4	440.6	424.3	423.4	15.1	16.0	0.9	fat clay	Sonic Core	Beck	SLR	2011	Decomm in Oct 2019
GL31-1	11-18A1	5536191.5	326639.6	439.4	440.3	432.5	431.0	6.9	8.4	1.5	fat clay (reworked soil, fill) followed by lean clay (native)	Sonic Core	Beck	SLR	2011	Decomm in September 2021
GL31-2	11-18B1	5536191.5	326639.6	439.2	440.0	428.6	427.7	10.6	11.5	0.9	lean clay followed by silt with sand	Sonic Core	Beck	SLR	2011	Active
GL31-3	11-18C	5536191.5	326639.6	439.5	440.4	425.2	424.2	14.3	15.3	1.0	silt some sand	Sonic Core	Beck	SLR	2011	Damaged 2020
GL32-1	11-21A1	5536093.5	326735.0	438.2	439.0	433.6	432.1	4.6	6.1	1.5	fat clay (native) with 1 cm sand lenses	Sonic Core	Beck	SLR	2011	Decomm in September 2021
GL32-2	11-21B	5536093.5	326735.0	437.8	438.7	429.7	428.8	8.1	9.0	0.9	lean clay with sand lenses followed by silty sand	Sonic Core	Beck	SLR	2011	Decomm in September 2021
GL32-3	11-21C1	5536093.5	326735.0	437.8	438.6	427.9	426.9	9.9	10.9	1.0	silty sand, trace clay	Sonic Core	Beck	SLR	2011	Decomm in September 2021
GL33-1	11-22A	5536202.4	326837.1	439.4	440.0	433.8	430.7	5.6	8.7	3.1	fat clay (reworked soil, fill) followed by silty sand with gravel (suspect till)	Sonic Core	Beck	SLR	2011	Decomm in Oct 2019
GL33-2	11-22B	5536202.4	326837.1	439.5	440.1	430.5	429.0	9.0	10.5	1.5	silty sand with gravel (suspect till)	Sonic Core	Beck	SLR	2011	Decomm in Oct 2019
GL33-3	11-22C	5536202.4	326837.1	439.5	440.2	427.7	426.2	11.8	13.3	1.5	silty sand with gravel (suspect till) followed by volcanic bedrock (weak)	Sonic Core	Beck	SLR	2011	Decomm in Oct 2019
GL35-1	11-31A1	5536105.2	326411.2	438.1	439.0	432.0	430.5	6.1	7.6	1.5	fat clay (reworked soil, fill) follwed by silty sand and lean clay	Sonic Core	Beck	SLR	2011	Active
GL35-2	11-31B	5536105.2	326411.2	438.1	439.0	427.5	425.9	10.6	12.2	1.6	lean clay	Sonic Core	Beck	SLR	2011	Active
GL35-3	11-31C	5536105.2	326411.2	438.4	439.3	425.1	423.6	13.3	14.8	1.5	silty sand with gravel (till)	Sonic Core	Beck	SLR	2011	Active
GL36-1	11-3A	5536496.4	326764.1	439.2	439.8	433.7	430.7	5.5	8.5	3.0	fat clay (reworked soil, fill) followed by fat clay (native) with cm sand layers	Sonic Core	Beck	SLR	2011	Decomm in Oct 2019
GL36-2	11-3B	5536496.4	326764.1	439.3	440.0	429.1	427.6	10.2	11.7	1.5	fat clay (native), trace sand followed by sandy silt	Sonic Core	Beck	SLR	2011	Decomm in Oct 2019
GL37	12-11	5536489.1	326646.4	439.3	440.1	437.5	431.4	1.8	7.9	6.1	interbedded silt clay and garbage followed by clay, silty layers with wood chunks	Sonic Core	MudBay	SLR	2012	Decomm in 2017
GL38	12-10	5536488.9	326634.4	439.3	440.1	437.5	431.5	1.8	7.8	6.0	interbedded silt clay and garbage followed by fat clay (reworked soil, fill). No recovery below 5 m.	Sonic Core	MudBay	SLR	2012	Decomm in 2017

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		UTM Coordinates		Grade	Piezo	Top of screen	Bottom of Screen	Top of Screen	Bottom of Screen	Screen Length	Lithology	Method	Company	Consultant	Year		
		Northing	Easting	(m msl)	(m msl)	(m msl)	(m msl)	(m bgs)	(m bgs)	(m bgs)							
West of Phase 3 Slough																	
GL8-1	GL8-1	5535944.5	326391.9	438.8	439.7	431.3	429.8	7.5	9.0	1.5	sand, some gravel	HSA	-	Gartner Lee	1990	Active	
GL8-2	GL8-2	5535944.5	326391.9	438.8	439.6	438.3	434.8	0.5	4.0	3.5	clay	HSA	-	Gartner Lee	1990	Active	
GL14-1	GL14-1	5536265.0	326258.7	453.3	453.8			>8			bedrock	Mud Rotary	Foundex	Golder	2005	Decomm in 2016	
East of Phase 3 Slough																	
GL7-1	GL7-1	5536434.3	326891.0	439.0	439.7	436.0	435.5	3.0	3.5	0.5	weathered bedrock	Air Rotary	-	Gartner Lee	1990	Active	
GL26-1	09-2-1	5535984.6	326863.3	440.9	441.4	435.8	434.3	5.1	6.6	1.5	clayey silt followed by bedrock, some fractures	Odex	-	Golder	2009	Active	
GL26-2	09-2-2	5535984.6	326863.3	440.7	441.6	437.0	435.5	3.7	5.2	1.5	clayey silt, trace sand and gravel	HSA	-	Golder	2009	Active	
GL26-3	09-2-3	5535984.6	326863.3	440.7	441.5	438.6	437.3	2.1	3.4	1.3	silty gravelly sand followed by layered clayey silt	SSA	-	Golder	2009	Active	
GL26-4	09-2-4	5535984.6	326863.3	440.7	441.5	417.8	414.8	22.9	25.9	3.0	bedrock	Odex	-	Golder	2009	Active	
GL10-1	GL10-1	5535933.0	326821.6	438.4	439.4	435.5	430.0	2.9	8.4	5.5	silty clay, some sand and gravel	HSA	-	Gartner Lee	1990	Active	
12-16	12-16	5536514.5	326448.7	-	-	-	-	6.1	10.7	4.6	fat clay (reworked soil, fill)	HSA	On the Mark	SLR	2012	Decomm in 2012	
GL25-1	09-1-1	5536149.0	327105.1	458.3	459.0	443.7	440.7	14.6	17.6	3.0	sand and gravel with silty clay (till)	Odex	-	Golder	2009	Decomm in 2016	
GL25-2	09-1-2	5536149.0	327105.1	458.3	459.108	456.5	455.0	1.8	3.3	1.5	interbedded clay and silty clay	SSA	-	Golder	2009	Decomm in 2016	
Compost Facility - South of Phase 3 Slough																	
GL27-1	09-3-1	5535841.1	326462.8	438.7	441.6	415.1	413.6	23.6	25.1	1.5	bedrock , some fractures	Odex	-	Golder	2009	Active	
GL27-2	09-3-2	5535841.1	326462.8	438.7	440.8	428.2	426.7	10.5	12.0	1.5	silty clay, some sand and gravel (till)	SSA	-	Golder	2009	Active	
GL27-3	09-3-3	5535841.1	326462.8	438.6	440.8	430.2	428.7	8.4	9.9	1.5	layered clay followed by silty clay, some sand and gravel (till)	HSA	-	Golder	2009	Active	
GL27-4	09-3-4	5535841.1	326462.8	438.7	440.6	437.9	436.9	0.8	1.8	1.0	sandy gravelly silt (fill)	SSA	-	Golder	2009	Active	
GL17-1	GL17-1	5535791.4	326494.6	439.2	440.3	-	-	>18	-	-	bedrock	Mud Rotary	Foundex	Golder	2005	Active	
GL17-2	GL17-2	5535791.4	326494.6	439.2	439.8	434.4	431.4	4.8	7.8	3.0	silty gravelly sand (till)	Mud Rotary	Foundex	Golder	2005	Active	
GL13-1	GL13-1	5535791.4	326494.6	-	439.8	-	-	4.6	7.6	3.0	silty sand with gravel (till)	HSA	-	Gartner Lee	1998	Active	
GL12-1	GL12-1	5535729.1	326538.3	441.3	442.3	435.2	432.2	6.1	9.1	3.0	silty sand (till)	HSA	-	Gartner Lee	1998	Active	
GL29-1	12-4A	5535749.3	326652.7	443.9	445.1	402.4	399.4	41.5	44.5	3.0	sand and silt followed by bedrock	Sonic Core	MudBay	SLR	2012	Active	
GL29-2	12-4B	5535749.3	326652.7	443.9	444.8	436.0	432.9	7.9	11.0	3.1	sand and silt (till)	Sonic Core	MudBay	SLR	2012	Active	
West of Compost Facility																	
GL15-1	GL15-1	5535905.1	326176.5	452.0	452.3	-	-	>12	-	-	bedrock	Mud Rotary	Foundex	Golder	2005	Active	
GL15-2	GL15-2	5535905.1	326176.5	451.7	452.0	448.6	445.6	3.1	6.1	3.0	sandy silt and gravel (till)	Mud Rotary	Foundex	Golder	2005	Active	
East of Compost Facility																	
06BH02	06BH02	5535672.4	327122.8	445.6	445.4	437.6	434.6	8.0	11.0	3.0	clay followed by sand and gravel	HSA	Kamloops	EBA	2006	Active	

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		Northing	Easting	(m msl)	(m msl)	(m msl)	(m msl)	(m bgs)	(m bgs)	(m bgs)						
South Perimeter of Site																
GL39-1	GL39-1	5535296.8	326790.4	439.5	440.4	430.7	429.5	8.8	10.0	1.2	silt, some sand, clay and gravel (till)	HSA	On the Mark	SNC Lavalin	2019	Active
GL39-2	GL39-2	5535297.6	326789.1	439.6	440.5	435.3	433.5	4.3	6.1	1.8	silty sand , trace gravel and clay	HSA	On the Mark	SNC Lavalin	2019	Active
GL39-3	GL39-3	5535298.3	326787.8	439.6	440.6	438.1	436.6	1.5	3.0	1.5	silty clay, some sand	HSA	On the Mark	SNC Lavalin	2019	Active
GL40-1	GL40-1	5535525.2	326465.2	449.7	450.5	446.7	445.1	3.0	4.6	1.6	sand and gravel, trace clay and silt (till)	HSA	On the Mark	SNC Lavalin	2019	Active
GL40-2	GL40-2	5535523.8	326466.4	449.6	450.4	435.0	433.4	14.6	16.2	1.6	volcanic bedrock, brown, hard	Sonic Core	VanMars	SNC Lavalin	2019	Decomm in September 2021
GL40-3	GL40-3	5535523.7	326466.2	449.6	450.4	439.8	438.0	9.8	11.6	1.8	clay and silt, some sand, trace gravel (till)	Sonic Core	VanMars	SNC Lavalin	2019	Decomm in September 2021
GL42-1	GL42-1	5535422.7	326636.2	447.6	448.4	429.3	427.7	18.3	19.9	1.6	sand and gravel, trace silt (till)	Sonic Core	VanMars	SNC Lavalin	2019	Active
GL42-2	GL42-2	5535422.6	326636.2	447.6	448.4	437.5	436.0	10.1	11.6	1.5	clayey silt	Sonic Core	VanMars	SNC Lavalin	2019	Active
GL42-3	GL42-3	5535423.9	326637.6	447.7	448.5	441.0	439.2	6.7	8.5	1.8	sand, gravel and cobbles (till)	Sonic Core	VanMars	SNC Lavalin	2019	Active
09BH01	09BH01	5535385.2	326712.8	-	-	-	-	-	-	-	-	SSA	Beck	SLR	2011	Decomm in Aug 2011
South and South East of Site																
09BH05-S	09BH05-S	5535090.7	326805.6	-	-	-	-	11.2	14.2	1.8	silty sand	HSA	Kel	EBA	2009	Inaccessible
09BH05-D	09BH05-D	5535090.7	326805.6	-	-	-	-	22.0	23.0	1.8	sand, some gravel, trace silt	HSA	Kel	EBA	2009	Inaccessible
09BH06-S	09BH06-S	5534457.6	326917.6	435.9	435.9	431.9	430.4	4.0	5.5	1.8	silty clay	HSA	Kel	EBA	2009	Active
09BH06-D	09BH06-D	5534457.6	326917.6	435.6	435.8	428.6	425.6	7.0	10.0	1.8	silty sand	HSA	Kel	EBA	2009	Active
09BH07	09BH07	5535293.6	327214.6	440.9	441.0	434.4	431.4	6.5	9.5	1.8	sand, trace silt	HSA	Kel	EBA	2009	Damaged 2020
09BH03	09BH03	5535064.2	327413.6	440.8	441.0	434.7	431.7	6.1	9.1	1.8	sand, trace silt	HSA	Kel	EBA	2009	Active
09BH04	09BH04	5535008.4	327178.2	436.2	436.4	425.0	422.0	11.2	14.2	1.8	sand and gravel, trace clay	HSA	Kel	EBA	2009	Active
GL28-1	09-4-1	5535273.8	326721.5	442.1	442.1	424.6	423.1	17.5	19.0	1.5	sand, some silt followed by gravel, some sand, trace silt	Odex	-	Golder	2009	Active
GL28-2	09-4-2	5535273.8	326721.5	441.4	441.8	435.9	434.4	5.5	7.0	1.5	silty sand	HSA	-	Golder	2009	Active
GL28-3	09-4-3	5535273.8	326721.5	441.4	441.7	438.9	437.4	2.5	4.0	1.5	layered silty clay, some sand	SSA	-	Golder	2009	Active

* Reference elevation is a mark on the rim of the monitoring well standpipe surveyed with respect to geodetic datum. HSA - Hollow Stem Auger

SSA - Solid Stem Auger

Table 2a. Historical Groundwater Elevations

Well ID	GL0-1	GL0-2	GL0-3	GL1-1	GL1-2	GL2-1	GL2-2	GL3-5	GL4-1	GL4-2	GL5-1	GL5-2	GL5-3	GL6-1 (2011)
Measurement date														
2015 Well Elevation	450.052	450.008	450.541	446.970	446.982	438.991	438.988	457.820	441.404	441.407	439.973	440.079	440.088	440.511
2015/03/17	444.112	440.943	440.898	445.077	444.994	438.791	438.590	439.181	440.059	439.746	438.593	438.591	438.570	437.889
2015/06/04	444.202	440.846	440.793	444.922	444.844	438.756	438.581	439.102	440.214	439.698	438.616	438.630	438.610	437.871
2015/08/27	444.213	440.748	440.691	444.461	444.386	437.460	437.716	439.007	439.993	439.516	437.513	437.472	437.343	437.556
2015/11/02	444.211	440.697	440.636	444.565	444.544	438.053	437.953	439.025	440.038	439.585	437.488	437.513	437.334	437.562
2016 Well Elevation	449.999	449.957	450.487	446.955	446.965	438.998	438.994	457.440	441.363	441.371	439.998	440.114	440.119	440.481
2016/03/22	444.361	440.856	440.797	445.451	445.350	438.888	438.764	439.020	440.254	439.780	438.669	438.651	438.605	437.931
2016/05/16	444.694	440.942	440.882	445.570	445.506	438.638	438.376	439.201	440.253	439.722	438.529	438.495	438.434	437.891
2016/09/16	444.907	440.992	440.923	444.820	444.743	438.216	437.759	439.145	440.072	439.600	437.927	437.892	437.808	437.696
2016/11/24	444.928	440.995	440.925	445.065	444.990	438.649	438.414	439.105	440.072	439.661	438.430	438.475	438.435	437.822
2017 Well Elevation														
2017/03/21	444.930	441.069	441.012	445.443	445.367	438.998	438.563	439.341	440.343	440.676	438.589	438.626	438.579	438.163
2017/06/05	445.449	441.309	441.242	445.847	445.670	438.967	438.842	Decommissioned	440.234	440.532	438.955	438.949	438.894	438.400
2017/08/16	445.621	441.351	441.288	444.824	444.742	438.613	438.193		440.081	439.953	438.493	438.441	438.381	438.067
2017/09/22	445.630	441.308	441.242	444.690	444.610	438.547	438.243		440.067	439.992	438.413	438.389	438.350	437.895
2017/11/14	445.660	441.281	441.222	444.841	444.805	438.848	438.685		440.162	440.243	438.693	438.710	438.696	437.900
2018 Well Elevation														
2018/03/16	445.621	441.402	441.348	445.732	445.693	438.998	438.865		440.554	440.720	438.987	438.986	438.939	438.426
2018/05/25	446.338	441.829	441.575	445.756	445.645	438.884	438.612		440.438	439.800	438.870	438.835	438.805	438.516
2018/08/30	446.861	443.054	443.056	444.814	444.725	438.687	438.481		439.819	439.331	438.564	438.563	438.525	437.544
2018/11/16	446.734	442.592	442.576	445.355	445.246	438.998	438.814		439.994	439.506	438.843	438.815	438.810	437.972
2019 Well	449.997	449.947	450.490	446.944	446.951	438.999	438.992		441.353	441.357	440.023	440.137	440.150	440.449
2019/03/21	446.512	442.622	442.591	445.674	445.579	438.999	436.592		440.153	439.647	438.913	438.868	438.859	438.359
2019/06/06	446.395	442.265	442.245	445.341	445.229	438.739	438.551		439.898	439.348	438.619	438.606	438.582	438.139
2019/07/12	446.297	442.160	442.137	445.100	445.000				439.881	439.322	438.545	438.493	438.445	437.839
2019/08/12	446.215	442.050	442.022	444.874	444.773	438.503	438.116		439.806	439.258	438.293	438.287	438.223	437.015
2019/08/13														
2019/10/28	446.003	441.875	441.841	445.129	445.033	438.779	438.613		439.891	439.348	438.624	438.622	438.617	437.540
2020 Well Elevation														
2020/03/21	445.870	441.760	441.720	445.730	445.610	438.770	438.990		440.250	439.600	438.820	438.800	438.780	438.200
2020/06/04				445.570	445.450	438.810	438.400		440.320	439.570	438.570	438.520	438.480	438.160
2020/09/15	Decommissioned			445.040	444.950	438.690	438.520		439.900	439.260	438.590	438.570	438.550	437.860
2020/11/26				445.290	445.200	438.900	438.640		439.900	439.330	438.710	438.680	438.660	437.510
2021 Well Elevation														
2021/03/29				445.440	445.340	438.870	438.640		440.100	439.480	438.720	438.690	438.670	438.210
2021/06/15				445.160	445.080	438.590	438.180		439.860	439.250	438.330	438.290	438.220	438.110
2021/09/29				444.410	444.330	438.830	438.650		439.690	439.080	438.510	438.650	438.790	Decommissioned
2021/10/26				444.900	444.830	438.750	438.300		439.770	439.170	438.470	438.420	438.360	
2022 Well Elevation (piezo)				446.924	446.943	438.987	438.976		441.345	441.363	439.955	440.092	440.115	
2022/03/29				445.284	445.204	438.986	438.584		440.177	439.533	438.620	438.616	438.584	
2022/06/24				445.171	445.090	438.873	438.478		440.084	439.367	438.578	438.551	438.510	
2022/09/29				444.573	444.494	438.660	438.345		439.725	439.096	438.322	438.325	438.305	
2022/10/27				444.930	444.869	438.792	438.491		439.783	439.158	438.490	438.488	438.473	

Table 2a. Historical Groundwater Eleva

Well ID	GL7-1	GL8-1	GL8-2	GL9-1	GL9-2	GL9-3	GL10-1	GL12-1	GL13-1	GL15-1	GL15-2	GL16-1	GL17-1
Measurement date													
2015 Well Elevation	439.744	439.729	GL8-2	439.592	439.477	439.505	439.392	441.834	439.757	452.37	452.086	439.612	440.286
2015/03/17	438.051	438.860	438.143	439.502	437.932	437.885	437.901	440.224	439.142	448.059	448.598	438.874	
2015/06/04	438.109	438.779	438.141	439.502	437.939	437.900	438.150	440.159	439.102	447.402	447.997	438.783	439.938
2015/08/27	437.814	437.530	437.291	439.414	437.509	437.460	437.372	439.985	438.957	447.665	448.251	437.567	439.905
2015/11/02	437.843	437.259	437.088	439.393	437.682	437.635	437.943	439.891	438.903	447.781	448.325	437.28	439.941
2016 Well Elevation	439.718	439.642	439.572		439.443	439.435	439.414	442.248		452.317	452.04	439.571	440.243
2016/03/22	438.137	438.829	438.188	Artesian	438.031	437.945	438.033	440.960	439.274	448.522	449.105	438.893	439.991
2016/05/16	438.126	438.777	438.019	Artesian	437.944	437.896	437.914	440.486	439.305	448.395	448.851	438.778	439.965
2016/09/16	437.953	438.047	437.684	Artesian	437.671	437.607	437.604	440.076	439.238	448.989	449.496	438.073	439.982
2016/11/24	438.020	438.750	438.043	Artesian	437.834	437.785	438.006	439.998	439.318	448.54	449.078	438.759	
2017 Well Elevation													
2017/03/21	438.298	439.030	438.480	Artesian	438.241	438.180	438.260	440.280	439.405	448.705	449.321	439.053	
2017/06/05	438.492	438.974	438.485	Artesian	438.438	438.367	438.422	440.560	439.507	448.224	447.76	439.031	440.163
2017/08/16	438.232	438.561	437.934	Artesian	438.108	438.030	438.009	NM	439.505	448.027	448.419	438.583	
2017/09/22	438.113	438.536	437.892	Artesian	437.978	437.893	437.880	440.310	439.466	447.829	448.293	438.548	
2017/11/14	438.118	438.754	438.164	Artesian	438.041	437.960	438.191	440.095	439.318	447.409	447.998	438.765	
2018 Well Elevation													
2018/03/16	NM	438.993	438.730	Artesian	438.519	438.434	438.479	NM	439.608	447.799	448.705	439.008	
2018/05/25	NM	438.919	438.472	Artesian	438.565	438.485	438.515	440.723	439.668	448.435	448.993	438.941	
2018/08/30	NM	438.843	438.115	Artesian	438.083	438.003	437.945	440.284	439.401	448.572	448.946	438.851	439.959
2018/11/16	438.206	438.942	438.342	Artesian	438.208	438.135	438.206	439.958	439.248	447.748	448.231	438.96	Artesian
2019 Well	439.721	439.650	439.574	439.565	439.449	439.444	439.418	442.251	439.759	452.322	452.039	439.577	440.247
2019/03/21	438.456	438.861	438.719	Artesian	438.457	438.461	438.480	439.766	439.328	447.301	447.921	438.827	440.247
2019/06/06	438.310	438.631	438.260	Artesian	438.287	438.205	438.186	439.750	439.158	446.871	447.34	437.422	440.247
2019/07/12		438.700	438.147	439.565	438.156	438.091	438.105	439.676	439.114	448.299	448.541	437.692	440.247
2019/08/12	438.054	438.587	437.899		438.032	437.973	438.132	439.684	439.074	448.608	449.032	438.633	440.234
2019/08/13													
2019/10/28	437.821	438.669	438.116	439.565	437.934	437.873	437.999	439.652	439.060	447.217	447.638	438.715	440.047
2020 Well Elevation													
2020/03/21	438.320	438.880	439.390	439.540	438.310	438.260	438.250	440.060	439.330	447.45	448.01	438.93	440.21
2020/06/04	438.300	438.690	438.270	439.520	438.280	438.210	438.220	440.060	439.350	448.93	449.43	438.74	440.23
2020/09/15	438.000	438.860	438.050	439.520	437.950	437.890	437.750	440.060	439.300	449.00	450.09	439.01	440.24
2020/11/26	438.020	439.030	438.210	439.540	438.080	439.040	438.110	439.950	439.260	448.82	449.39	439.08	440.18
2021 Well Elevation													
2021/03/29	438.300	438.670	438.370	439.540	438.330	438.290	438.300	439.990	439.260	448.04	448.53	439.00	440.17
2021/06/15	438.180	438.900	437.730	439.530	438.160	438.110	438.070	439.840	439.240	448.87	449.38	438.97	440.19
2021/09/29	437.840	438.740	438.040	439.570	Decommisione		437.710	439.690	439.080	447.25	447.71	438.79	440.19
2021/10/26	437.860	438.410	437.930	439.570			437.890	439.660	439.090	447.50	448.11	438.47	440.13
2022 Well Elevation (piezo)	439.679	439.652	439.546	Decomis			439.383	442.234	440.875	452.302	452.046	439.549	440.774
2022/03/29	438.143	438.736	438.302				438.118	440.193	439.401	447.66	448.33	438.77	440.17
2022/06/24	438.129	438.825	438.661				438.097	440.201	439.420	447.97	448.60	438.93	440.15
2022/09/29	437.721	438.603	437.960				437.620	439.983	439.258	448.47	449.02	438.62	440.20
2022/10/27	437.721	438.691	438.046				437.775	439.950	439.256	447.75	448.26	438.72	440.10

Table 2a. Historical Groundwater Eleva

Well ID	GL17-2	GL18-2	GL18-3	GL20-1	GL23-1	GL24-1	06BH02	09BH03	09BH04	09BH06-D	09BH06-S	09BH07	GL26-1	GL26-2	GL26-3	GL26-4
Measurement date																
2015 Well Elevation	439.815	442.955	442.89	441.229	446.633	447.604	445.441	441.01	436.362	435.814	435.867	441.046	441.453	441.533	441.516	441.575
2015/03/17	439.08	439.085	437.99	438.21	444.578	444.98	444.101	435.871	436.062	435.615	435.419	437.047	440.595	438.178	438.261	438.176
2015/06/04	439.067	439.504	437.93	438.261	444.481	444.817	444.273	435.758	435.937	435.593	435.432	436.971	440.592	438.608	438.566	438.435
2015/08/27	438.9	439.384	437.66	437.844	444.128	444.393	444.131	435.625	435.773	435.345	435.072	436.834	440.454	437.782	437.796	437.735
2015/11/02	438.955	439.587	437.66	437.711	444.143	444.516	444.35	435.644	435.881	435.471	435.312	436.911	440.447	438.293	438.253	438.097
2016 Well Elevation	439.775	442.899	442.828	441.16	446.602	447.614	445.351	441	436.336	435.798	435.871	441.054	441.455	441.513	441.498	441.568
2016/03/22	439.15	439.735	438.183	438.202	445.013	445.419	444.796	436.277		435.786	435.522	437.772	440.917	438.279	438.346	438.313
2016/05/16	439.108	439.78	438.093	438.161	444.895	445.835	445.227	436.381	436.321	435.654	435.401	437.699	440.921	438.183	438.2	438.153
2016/09/16	439.113	439.67	437.818	437.895	444.219	444.796	445.201	436.399		435.698	435.362	438.474	440.777	437.924	437.954	437.864
2016/11/24	439.193	439.66	437.888	438.028	444.645	445.025	445.331	436.245		435.748	435.486	438.004	440.82	438.264	438.343	438.246
2017 Well Elevation												441.042				
2017/03/21	439.335	439.69	438.218	438.631	445.273	445.523		436.602			435.6	439.432	441.067	438.553	438.628	438.549
2017/06/05	439.365	439.743	438.598	438.552	445.187	445.782		436.601			435.527	438.782	441.305	438.654	438.724	438.635
2017/08/16	439.343	439.616	438.308	438.22	444.398	444.854	445.259			435.67	435.309	439.287	441.16	438.234	438.229	438.186
2017/09/22	439.322	439.654	438.118	438.095	444.346	444.683	445.171	436.139		435.578	435.346	438.627	441.086	438.129	438.123	438.092
2017/11/14	439.317	439.761	438.088	438.161	444.468	444.843	445.111	436.049	436.166	435.618	435.43	438.351	441.02	438.464	438.448	438.389
2018 Well Elevation																
2018/03/16	439.565	440.099	438.678	438.717	445.226	445.649							441.305	438.821	438.885	438.859
2018/05/25	439.505	440.304	438.688	438.585	445.347	445.844		436.47			435.566			438.749	438.783	438.789
2018/08/30	439.302	440.001	437.673	438.393	444.43	444.844		436.385		435.768	435.564	439.682	441.225	438.367	438.431	438.42
2018/11/16	439.223	440.017	438.068	438.332	444.643	446.325		436.318			435.569	439.377	441.166	438.468	438.51	438.477
2019 Well	439.783			441.138	446.597	447.568	445.37	440.985	436.348	435.827	435.884	441.011	441.442	441.56	441.491	441.507
2019/03/21	439.251	Decommissioned		438.476	445.146	445.637	445.37	436.336	436.348	435.827	435.694	439.701	441.172	438.55	438.571	438.487
2019/06/06	439.049			438.348	445.018	445.339	445.37	435.986	436.348	435.827	435.684	439.641	441.212	438.458	438.402	438.319
2019/07/12	439.02			438.211	444.863	445.095							441.161	438.487	438.599	438.472
2019/08/12	438.976			438.022	444.584	444.827		437.52	artesian	artesian	435.582	439.697	441.119	438.487	438.846	438.686
2019/08/13							445.37									
2019/10/28	438.985			438.157	444.802	445.089	445.37	436.744	436.348	435.827	435.606	439.051	441.032	438.338	438.386	438.292
2020 Well Elevation																
2020/03/21	439.72			438.40	445.37	445.72							441.43	438.50	438.49	438.41
2020/06/04	439.21			438.28	445.36	445.59	Artesian	437.08		Artesian	435.71	439.18	441.28	438.59	438.61	438.53
2020/09/15	439.18			438.17	444.35	445.01		436.84	artesian	Artesian	435.64		441.19	438.17	438.14	438.06
2020/11/26	439.18			438.25	444.95	445.27		436.58	artesian	Artesian	435.71		441.16	438.38	438.41	438.34
2021 Well Elevation																
2021/03/29	439.15			438.38	445.26	445.43	Artesian	436.42	Artesian	Artesian	435.76	436.11	441.29	438.50	438.45	438.38
2021/06/15	439.12			438.08	444.94	445.16	CNA,	436.97	Artesian	Artesian	435.71	Damaged	441.24	438.33	438.32	438.29
2021/09/29	439.01	as		438.19	443.80	444.37	CNL	436.97	Artesian	artesian	435.638	Damaged	441.01	438.16	438.21	438.17
2021/10/26	439.03			437.99	444.73	444.86	CNL	436.80	Artesian	artesian	435.663	Damaged	441.02	438.30	438.39	438.35
2022 Well Elevation (piezo)	440.677			441.125	446.572	447.537	446.264	440.96	436.299	436.239	435.813	440.966	441.416	441.46	441.457	441.532
2022/03/29	439.19			438.28	444.78	445.26	damaged	436.94	artesian	artesian	435.76		440.98	438.41	438.49	438.52
2022/06/24	439.27			438.33	445.00	445.13	445.869	437.12	artesian	artesian	435.73		441.15	438.44	438.53	438.56
2022/09/29	439.12			438.03	444.39		445.912	damaged	artesian		435.93	435.69	441.03	438.06	438.19	438.26
2022/10/27	439.13			438.11	444.48	444.91	445.763		artesian		435.90	435.67	441.02	438.24	438.42	438.39

Table 2a. Historical Groundwater Eleva

Well ID	GL27-1	GL27-2	GL27-3	GL27-4	GL28-1	GL28-2	GL28-3	GL29-1	GL29-2	GL30-1	GL30-2	GL30-3	GL31-1	GL31-2
Measurement date														
2015 Well Elevation	440.089	439.314	439.32	439.143	442.111	441.862	441.781	445.083	444.879	440.13	440.852	440.709	440.273	440.048
2015/03/17	439.969	438.325	438.408	438.256	436.376	436.7	436.701	440.178	441.419	437.907	438.073	438.07	437.861	437.947
2015/06/04	439.617	438.135	438.302	438.154	436.236	436.454	436.459	440.227	441.444	437.922	438.084	438.137	437.868	437.979
2015/08/27	439.581	438.049	438.003	437.565	436.129	436.421	436.436	440.153	441.167	437.655	437.824	437.878	437.575	437.719
2015/11/02	439.594	438.039	438.022	437.724	436.113	436.293	436.309	440.164	440.994	437.647	437.804	437.91	437.503	437.606
2016 Well Elevation	440.047	439.273	439.286	439.092	442.067	441.783	441.723	445.047	444.744	439.992	440.719	440.559	440.253	439.987
2016/03/22	439.827	438.524	438.537	438.304	436.609	436.841	436.878	440.455	441.056	437.867	438.02	438.076	437.864	438.012
2016/05/16	439.847	438.231	438.351	438.002	436.448	436.697	436.693	440.467	441.364	437.943	438.102	438.172	437.862	438.002
2016/09/16	439.786	438.198	438.181	437.764	436.672	436.924	436.928	440.485	441.172	437.768	437.948	438.06	437.673	437.817
2016/11/24	440.032	438.413	438.406	438.474	436.599	436.851	436.855	440.462	441.395	437.853	438.03	438.099	437.761	437.888
2017 Well Elevation														
2017/03/21		438.571	438.781	438.554	436.885	437.281	437.285	440.627	441.373	438.134	438.328	438.288	438.034	438.217
2017/06/05		438.609	438.711	438.587	436.802	437.1	437.095	440.826	441.764	438.367	438.527	438.521	438.222	438.406
2017/08/16		438.381	438.396	438.045	436.842	437.387	437.39	440.778	441.309	438.132	438.17	438.223	438.013	438.157
2017/09/22		438.291	438.346	437.971	436.518	436.821	436.814	440.726	441.015	438.013	438.144	438.127	437.908	438.042
2017/11/14		438.435	438.5	438.462	436.425	436.655	436.647	440.726	440.735	438.002	438.147	438.175	437.895	438.036
2018 Well Elevation	441.547	440.776	440.789	440.57										
2018/03/16		440.277			436.844	437.249	437.231	440.899	441.576	438.38	438.563	438.564	438.234	438.402
2018/05/25					436.858	437.328	437.313	441.055	441.849	438.487	438.628	438.639	438.361	438.519
2018/08/30		439.977	439.927	439.778	436.607	436.867	436.855	440.905	441.308	438.016	438.165	438.195	438.069	438.123
2018/11/16	440.187	438.316	438.534	438.36	436.698	437.051	437.044	440.928	441.259	438.102	438.258	438.287	438.028	438.21
2019 Well	441.562	440.796	440.807	440.585	442.056	441.787	441.736	445.05	444.756	439.998	440.699	440.555	440.241	439.985
2019/03/21	441.302	438.835	439.188	438.955	436.633	436.918	436.854	440.916	441.095	438.368	438.484	438.485	438.24	438.426
2019/06/06	440.24	438.646	438.458	438.551	436.595	436.819	436.815	440.8	441.244	438.21	438.32	438.364	438.092	438.246
2019/07/12	440.233	438.532	438.363	438.405	436.79	436.97	436.963	440.852	441.276	438.061	438.186	438.231	437.963	438.132
2019/08/12	440.241	438.449	438.251	438.292	436.791	436.934	436.929	440.811	441.379	437.858	438.057	438.111	437.833	438.01
2019/08/13														
2019/10/28	440.11	438.387	438.333	438.214	436.677	436.872	436.862	440.74	441.123		Decommissioned		437.721	437.895
2020 Well Elevation														
2020/03/21	440.10	438.64	438.61	438.59				440.94	441.56				438.06	438.26
2020/06/04	440.25	438.65	438.56	438.60	436.89	437.17	436.16	440.93	441.73				438.06	438.23
2020/09/15	440.16	438.36	438.33	438.23	437.06	437.50	437.49	440.88	441.40					437.97
2020/11/26	440.16	438.41	438.48	438.38	436.79	437.09	437.08	440.83	441.37					438.07
2021 Well Elevation														
2021/03/29	440.15	438.54	438.62	438.53	436.71	436.98	436.98	440.92	441.33				Damaged	438.29
2021/06/15	440.17	438.48	438.41	438.43	437.25	438.19	438.21	440.92	441.23				Damaged	438.12
2021/09/29	440.00	438.23	438.20	438.03	436.78	437.08	437.08	440.74	440.90				Damaged/Dec	437.78
2021/10/26	440.09	438.24	438.23	438.08	436.71	436.98	436.98	440.77	440.79				Decommissio	437.79
2022 Well Elevation (piezo)	441.535	440.821	440.744	440.679	441.996	441.726	441.687	445.006	444.722					439.934
2022/03/29	440.18	438.57	438.59	438.95	436.82	437.20	437.20	440.81	441.60					438.10
2022/06/24	440.19	438.51	438.63	438.91	436.80	437.06	437.06	440.82	441.82					438.07
2022/09/29	440.14	438.25	438.27	438.52	436.78	436.98	436.98	440.74	441.27					437.75
2022/10/27	440.15	438.23	438.32	438.18	436.71	436.92	436.93	440.73	441.00					437.72

Table 2a. Historical Groundwater Eleva

Well ID	GL31-3	GL32-1	GL32-2	GL32-3	GL33-1	GL33-2	GL33-3	GL34-1	GL34-2	GL34-3	GL35-1	GL35-2	GL35-3	GL36-1	GL36-2	GL36-3
Measurement date																
2015 Well Elevation	440.359	438.993	438.692	438.682	440.448	440.516	440.518	440.061	439.982	440.15	438.955	439.043	439.264	440.148	440.135	440.080
2015/03/17	437.991	437.803	437.994	438.042	438.11	438.121	438.117	437.935	438.382	438.395	438.17	438.739	438.734	438.099	438.390	438.460
2015/06/04	437.994	437.855	438.003	438.079	438.146	438.161	438.156	437.996	438.384	438.41	438.167	438.663	438.653	438.156	438.436	438.490
2015/08/27	437.818	437.633	437.756	437.787	437.848	437.862	437.856	437.683	437.84	437.855	437.023	437.575	437.734	438.030	438.236	438.292
2015/11/02	437.695	437.553	437.72	437.752	437.859	437.881	437.88	437.443	437.547	437.552	436.754	437.273	437.265	437.987	438.284	438.337
2016 Well Elevation	440.33	438.97	438.666	438.644	440.173	440.255	440.258	440.033	439.884	440.065	438.914	439.003	439.224	440.045	440.052	440.057
2016/03/22	438.2	437.859		438.134	437.938	437.935	437.959	437.981	438.359	438.395	438.115	438.769	438.685	438.133	438.465	438.591
2016/05/16	438.031	437.885		438.094	438.155	438.173	438.163	437.991	438.282	438.32	438.013	438.591	438.578	438.190	438.517	438.584
2016/09/16	437.772	437.729	437.882	437.894	437.981	437.996	437.997	437.812	438.025	438.037	437.519	438.028	438.04	438.13	438.44	438.50
2016/11/24	437.87	437.75	437.964	437.989	438.045	438.06	438.054	437.833	438.192	438.205	437.95	438.638	438.625		438.487	438.529
2017 Well Elevation														439.861		
2017/03/21	438.308	438.04			438.334	438.345	438.343	438.161	438.585	438.597	438.289	438.958	438.936	438.096	438.603	438.666
2017/06/05	438.565				438.543	438.55	438.539	438.402	438.726	438.735			439.056	438.332	438.726	438.768
2017/08/16	438.278				438.275	438.286	438.284	438.205	438.412	438.426	438.029	438.542	438.542	438.183	438.554	438.558
2017/09/22	438.169	438			438.148	438.16	438.15	438.074	438.299	438.315	437.976	438.492	438.49	438.13	438.48	438.48
2017/11/14	438.179	437.94			438.141	438.164	438.157	438.058	438.357	438.37	438.132	438.663	438.655	438.196	438.529	438.525
2018 Well Elevation																
2018/03/16	438.478				438.568	438.579	438.574	438.361	438.715	438.726			438.871	438.346	438.877	438.792
2018/05/25	438.59				438.642	438.656	438.647	438.48	438.688	438.747				438.511	438.997	438.877
2018/08/30	438.173				438.145	438.156	438.141	438.189	438.467	438.505	438.145		438.791	438.015	438.563	438.533
2018/11/16	438.315				438.235	438.243	438.236	438.275	438.612	438.622	438.315	438.883	438.864	438.259	438.621	438.598
2019 Well	440.325	439.018	438.693	438.718	440.034	440.141	440.181	440.014	439.735	440.045	438.934	439.026	439.245	439.797	440.039	440.043
2019/03/21	438.512				438.455	438.461	438.471	438.38	438.723	438.726				438.398	438.829	438.813
2019/06/06	438.317				438.315	438.332	438.332	438.195	438.466	438.466	438.255	438.637	438.635	438.382	438.718	438.691
2019/07/12	438.228				438.181	438.201	438.206	438.124	438.38	438.185	438.131	438.712	438.692	438.224	438.588	438.563
2019/08/12	438.099				438.071	438.086	438.079	438.02	438.261	438.271	437.941	438.598		438.041	438.466	438.446
2019/08/13																
2019/10/28	438.005	437.198					Decommissioned	437.951	438.247	438.246	438.13	438.68	438.667	Decommission		
2020 Well Elevation																
2020/03/21	438.33							438.22	438.29	438.57	438.37	438.84	438.83			
2020/06/04	438.33							438.20	438.48	438.48	438.13	438.69	438.67			
2020/09/15		437.93	438.04					438.04	438.36	438.35	438.18	438.83	438.82			
2020/11/26		437.94						438.11	438.49	438.48	438.26	439.00	438.98			
2021 Well Elevation																
2021/03/29	Damaged		CNA	CNA				438.27	438.60	438.60	438.36	CNA	438.91			
2021/06/15	Damaged	CNA	CNA	CNA				438.11	438.39	438.40	437.98	438.94	438.93			
2021/09/29	Damaged/Dec		Decommissioned					437.87	438.21	438.22	438.12	438.70	438.69			
2021/10/26			Decommissioned					437.88	438.18	438.18	437.94	438.41	438.41			
2022 Well Elevation (piezo)								440.001	439.719	440.021	438.902	438.979	439.206			
2022/03/29								438.08	438.43	438.42	438.21	438.676	438.69			
2022/06/24								438.08	438.38	438.38	438.17	438.84	438.84			
2022/09/29								437.87	438.14	438.13	437.95	438.52	438.53			
2022/10/27								437.86	438.17	438.16	438.04	438.60	438.61			

Table 2a. Historical Groundwater Eleva

Well ID	GL37	GL38	GL39-1	GL39-2	GL39-3	GL40-1	GL40-2	GL40-3	GL41-1	GL41-2	GL41-3	GL42-1	GL42-2	GL42-3
Measurement date														
2015 Well Elevation	440.248	440.228												
2015/03/17	437.888	437.880												
2015/06/04	437.864	437.858												
2015/08/27	437.527	437.521												
2015/11/02	437.568	437.568												
2016 Well Elevation	440.144	440.075												
2016/03/22	437.859	437.804												
2016/05/16	437.882	437.876												
2016/09/16	437.70	437.69												
2016/11/24	437.745	437.800												
2017 Well Elevation														
2017/03/21	438.152	438.143												
2017/06/05	438.370	438.371												
2017/08/16	438.054	438.043												
2017/09/22	Decommission													
2017/11/14														
2018 Well Elevation														
2018/03/16														
2018/05/25														
2018/08/30														
2018/11/16														
2019 Well			440.410	440.460	440.560	448.430	448.420	448.470	450.490	450.450	450.440	450.570	450.550	450.570
2019/03/21														
2019/06/06														
2019/07/12														
2019/08/12														
2019/08/13														
2019/10/28														
2020 Well Elevation														
2020/03/21			437.09	437.13	437.19		443.50	443.55	448.39	448.33	448.36	440.04	439.79	
2020/06/04			437.14	437.23	437.21		443.27	443.29	448.13	448.15	448.16	440.05	439.79	
2020/09/15			437.43	437.51	437.63		443.08	443.12	447.76	447.65	447.66	449.37	440.16	
2020/11/26			437.13	437.20	437.28		441.58	441.61	447.41	447.36	447.38	440.04	439.82	
2021 Well Elevation														
2021/03/29			437.02	437.06	437.14	Dry	442.91	442.96	448.23	448.18	448.20	439.99	439.72	Dry
2021/06/15			437.20	437.51	437.49	Dry	440.62	440.58	447.91	447.86	447.87	439.96	439.74	Dry
2021/09/29			437.04	437.09	437.12	Dry	Decommissioned		447.86	447.80	447.82	439.90	439.71	Dry
2021/10/26			437.04	437.08	437.05	Dry			447.86	447.81	447.82	439.82	439.63	Dry
2022 Well Elevation (piezo)			440.353	440.385	440.521	450.489			450.574	450.571	450.588	448.406	448.407	448.435
2022/03/29			437.19	437.25	437.43	445.35			448.07	448.04	448.09	438.01	437.75	438.95
2022/06/24			437.15	437.19	437.23	dry			448.18	448.15	448.20	damaged	437.66	damaged
2022/09/29			437.21	437.24	437.15	dry			448.06	448.04	448.09		437.64	
2022/10/27			437.07	437.12	437.15	dry			448.08	448.06	448.11		437.55	

Table 2b: Surface Water Elevations

Well ID	BREDIN POND	NORTHEAST POND	SLOUGH	TUTT POND
Measurement date				
2015 Elevation	439.211	444.22	439.249	440.72
2015-03-17	438.701	443.53	437.859	438.58
2015-06-04	438.761	443.58	437.839	438.59
2015-06-16	438.721	NM	437.639	438.569
2015-07-29	438.651	NM	437.624	437.58
2015-08-27	438.651	443.15	437.519	NM
2015-09-18	438.651	NM	437.504	436.67
2015-10-21	438.681	NM	437.514	NM
2015-11-02	438.691	443.18	437.559	436.47
2015-12-11	438.701	NM	437.671	437.515
2016 Elevation	NM	NM	NM	440.677
2016-01-21	438.691	NM	437.729	438.237
2016-02-23	438.751	NM	437.869	438.547
2016-03-22	438.781	443.83	437.959	438.447
2016-04-26	438.651	NM	437.959	438.397
2016-05-16	438.691	NM	437.899	438.177
2016-05-20	NM	443.85	NM	NM
2016-06-22	438.691	NM	437.859	438.417
2016-07-12	438.691	NM	437.809	438.427
2016-08-19	438.701	NM	437.749	437.927
2016-09-16	438.551	443.28	437.689	437.337
2016-10-18	438.701	NM	437.739	436.987
2016-11-24	438.721	443.18	437.809	438.367
2016-12-16	438.781	NM	437.779	438.427
2017 Elevation	NM	NM	NM	440.689
2017-02-21	438.711	443.66	437.999	438.479
2017-03-21	438.721	446.53	438.149	NM
2017-04-18	438.811	443.48	438.309	438.689
2017-05-08	438.811	443.48	438.359	438.709
2017-06-05	438.901	443.28	438.399	438.839
2017-06-21	438.851	443.16	438.359	438.799
2017-07-17	438.651	443.1	438.219	438.909
2017-08-16	438.581	443.07	438.059	438.009
2017-09-22	438.501	446.03	437.899	438.129
2017-10-26	438.691	446.12	437.859	438.399
2017-11-14	438.711	443.17	437.899	438.659
2017-12-08	438.911	443.31	437.919	438.889
2018 Elevation	439.171	444.216	439.238	440.719
2018-03-16	438.871	443.866	438.419	438.847
2018-04-17	438.991	NM	438.669	438.914
2018-05-25	438.931	NM	438.519	438.529
2018-06-19	438.821	443.686	438.379	438.639
2018-07-13	438.761	442.426	438.248	438.787
2018-08-13	438.741	442.511	437.908	438.369
2018-08-30	438.721	442.326	437.739	438.499
2018-09-17	438.761	442.326	437.568	438.819
2018-10-11	438.821	442.996	437.668	438.879
2018-11-16	438.781	443.016	437.968	438.819
2018-12-12	438.771	443.076	438.118	438.799
2019 Elevation	439.171	444.216	439.238	440.739
2019-01-04	438.791	443.126	438.193	438.859
2019-03-21	438.761	443.174	438.278	438.819
2019-03-28	438.741	443.236	438.403	438.799
2019-04-08	NM	444.165	439.222	NM
2019-04-09	438.461	443.516	438.436	438.689
2019-05-02	438.671	443.806	438.348	438.649
2019-05-09	438.751	443.546	438.288	438.599
2019-05-29	438.601	442.506	438.198	438.474
2019-06-06	438.661	442.566	438.148	438.599
2019-07-05	438.681	442.646	437.918	438.409
2019-07-12	NM	442.694	437.883	438.266
2019-07-17	438.651	442.709	437.835	438.084
2019-07-26	NM	442.089	437.774	437.932
2019-08-01	NM	442.716	437.718	437.909
2019-08-09	438.321	442.381	437.641	438.19
2019-08-12	438.281	442.394	437.631	438.06
2019-08-21	438.081	442.384	437.549	437.981
2019-08-28	438.071	442.406	437.498	438.124
2019-09-04	NM	442.446	437.468	438.079
2019-09-17	NM	442.546	437.468	438.149
2019-09-27	NM	442.645	437.523	438.209
2019-10-19	NM	442.714	437.593	438.288
2019-10-28	NM	442.836	437.683	438.677
2019-11-08	438.681	442.894	437.666	438.739
2020 Elevations				438.152
2020-01-28	438.791	443.477	438.039	438.781
2020-02-12	438.801	NM	438.108	438.78
2020-03-21	NM	443.786	438.149	NM
2020-04-07	438.751	NM	438.183	NM

Well ID	BREDIN POND	NORTHEAST POND	SLOUGH	TUTT POND
Measurement date				
2020-05-20	438.791	NM	NM	NM
2020-06-04	438.741	NM	438.129	NM
2020-07-22	438.731	NM	437.899	NM
2020-08-12	438.841	NM	437.784	NM
2020-09-11	NM	NM	NM	438.512
2020-09-15	438.691	442.986	437.676	NM
2020-09-23	NM	NM	NM	438.282
2020-09-28	NM	NM	NM	438.152
2020-10-07	NM	NM	NM	438.152
2020-10-15	438.741	442.326	437.659	438.212
2020-11-06	NM	NM	NM	438.572
2020-11-12	NM	NM	NM	438.572
2020-11-19	NM	NM	NM	438.572
2020-11-26	438.701	442.745	437.717	438.572
2020-12-09	NM	NM	NM	438.572
2020-12-21	438.711	442.946	437.789	438.572
2021 Elevations	439.166	444.165	439.219	437.707
2021-01-14	438.656	443.065	437.849	438.572
2021-02-25	438.656	443.305	438.019	438.572
2021-03-29	438.646	443.505	438.155	438.572
2021-04-22	438.336	443.585	438.139	438.557
2021-05-17	438.646	443.055	438.089	438.357
2021-06-15	438.67	442.44	437.97	<437.707
2021-07-12	438.636	442.405	437.789	438.167
2021-08-04	438.566	442.315	437.649	438.097
2021-09-29	438.556	442.43	437.508	438.647 ⁶
2021-10-26	438.626	442.634	437.493	438.08
2021-11-08	438.486	442.755	437.519	438.137
2021-12-07	438.646	443.025	437.619	438.577
2022 Elevations	439.146	444.166	439.192	437.688
2022-01-11	438.636	443.26	437.572	438.558
2022-02-03	438.626	443.43	437.752	438.478
2022/03/09	438.636	NM	NM	438.428
2022-03-23	438.646	444.12	NM	438.428
2022-03-29	438.626	444.07	437.937	438.428
2022-04-20	438.626	444.07	437.971	438.438
2022-05-25	438.636	434.17	437.912	438.158
2022-06-24	438.646	443.46	437.862	438.308
2022-07-19	438.636	442.91	437.721	438.088
2022-08-25	438.636	442.58	437.491	438.438
2022-09-29	438.636	442.61	437.285	438.258
2022-10-27	438.526	442.73	437.236	438.398
2022-11-23	438.646	442.93	437.249	438.438
2022-12-12	438.636	443.01	437.286	438.438

Table 3: Summary of Groundwater Analytical Results - Monitoring Wells

SAMPLE ID DATE SAMPLED MATRIX Sampling Location # (Figures 7A to 7G) ¹			Provincial Standards and Guidelines					Federal Guidelines		Upgradient Wells: Spring				Upgradient Wells: Fall				
			BC CSR			BC WQG		Canadian Guidelines for Drinking Water Quality		GL41-1	GL41-2	GL41-3	GL23-1	GL41-1	GL41-2	GL41-3	GL15-1	GL15-2
			AW	IW	DW	IW (LT)	IW(ST)*			2022-06-15	2022-06-15	2022-06-15	2022-06-06	2022-09-23	2022-09-23	2022-09-23	2022-10-05	2022-10-05
								MAC*	AO*	Water	Water	Water	Water	Water	Water	Water	Water	
Dissolved Metals	Units	RDL																
Aluminum	ug/L	5	-	5000	9,500	-	5000	100	-	2.3	1.2	9.8	2.9	1.6	<1.0	9.2	<3.0	<5.0
Antimony	ug/L	0.2	90	-	6	-	-	6	-	0.544	0.064	0.063	<0.050	0.384	0.061	0.077	<0.050	<0.250
Arsenic	ug/L	0.5	50	100	10	-	100	10	-	1.21	0.944	0.924	0.478	1.07	0.96	0.957	0.333	0.641
Barium	ug/L	5	10,000	-	1,000	-	-	2000	-	81.6	57.5	56.7	68.8	75.3	65.7	74.5	30.2	13.3
Beryllium	ug/L	0.1	1.5	100	8	100	-	-	-	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.050
Bismuth	ug/L	0.1	-	-	-	-	-	-	-	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.050
Boron	ug/L	50	12,000	500	5,000	500	-	5000	-	39.1	25.6	25.5	37.9	36.9	23.6	25.1	7.9	<10.0
Cadmium	ug/L	0.01	2.5-4(H)	5	5	-	5.1	7	-	0.054	0.006	0.011	0.049	0.0339	0.0099	0.0148	0.0571	0.0477
Calcium	ug/L	200	-	-	-	-	-	-	-	56600	50100	47400	86300	58700	60400	63900	34100	285000
Chromium	ug/L	0.5	10	5	50	4.9	-	50	-	1.66	1.62	1.5	0.21	1.28	1.68	1.42	0.21	6.69
Cobalt	ug/L	0.1	40	50	1	50	-	-	-	0.0469	0.0354	0.0508	0.755	0.05	0.039	0.0518	0.0056	0.167
Copper	ug/L	0.4	40-90(H)	200	1,500	-	200	2000	1000	2.930	1.820	1.000	4.250	2.71	0.91	1.14	1.2	3.21
Iron	ug/L	10	-	5000	6,500	-	-	-	300	2.2	2.9	13.5	4.5	<2.0	<2.0	13.6	<2.0	<10.0
Lead	ug/L	0.2	50-160(H)	200	10	-	200	5	-	<0.050	0.058	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.250
Lithium	ug/L	0.1	-	2500	8	750	-	-	-	39.4	29.7	31.1	39.6	38.1	32.9	37	16.7	39.6
Magnesium	ug/L	10	-	-	-	-	-	-	-	109000	84600	86300	232000	109000	98400	111000	63100	581000
Manganese	ug/L	0.2	-	200	1,500	-	-	120	20	7.64	0.547	1.65	309	1.8	<0.050	1.33	0.794	1.18
Mercury	ug/L	0.01	0.25	1	1	-	2	1	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	ug/L	0.1	10,000	10	250	10	50	-	-	13.1	7.27	6.82	14.4	15.8	7.39	7.35	6.51	19
Nickel	ug/L	0.4	650-1500(H)	200	80	200	-	-	-	1.200	0.474	0.534	8.480	1.01	0.467	0.64	0.359	1.89
Phosphorus	ug/L	50	-	-	-	-	-	-	-	52	33	25	<10	44	30	27	20	<50
Potassium	ug/L	100	-	-	-	-	-	-	-	15700	12800	13600	16300	17100	15100	18400	1620	11400
Selenium	ug/L	0.5	20	20	10	-	10	50	-	0.91	0.52	0.43	0.2	0.79	0.55	0.45	0.25	12.3
Silicon	ug/L	1000	-	-	-	-	-	-	-	9000	9300	9260	11500	9900	11400	12200	10100	9960
Silver	ug/L	0.05	0.5-15(H)	-	20	-	-	-	-	<0.010	<0.010	<0.010	0.022	<0.010	<0.010	<0.010	<0.010	<0.050
Sodium	ug/L	100	-	-	200,000	-	-	-	200,000	246000	195000	200000	197000	230000	199000	221000	172000	786000
Strontium	ug/L	1	-	-	2,500	-	-	7000	-	2250	2140	1960	4770	2200	2440	2600	3790	6830
Sulfur	ug/L	300	-	-	-	-	-	-	-	63300	35100	35700	153000	67600	41700	46000	97900	1400000
Tellurium	ug/L	0.5	-	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.250
Thallium	ug/L	0.02	3	-	-	-	-	-	-	0.0365	<0.0040	0.0058	<0.0040	0.0536	<0.0040	0.0049	0.0061	<0.0200
Thorium	ug/L	0.1	-	-	-	-	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Tin	ug/L	0.2	-	-	2,500	-	-	-	-	0.166	0.082	<0.050	0.065	0.128	<0.050	<0.050	<0.050	<0.250
Titanium	ug/L	5	1,000	-	-	-	-	-	-	<0.20	<0.20	0.48	0.29	<0.20	<0.20	0.49	<0.20	<1.00
Tungsten	ug/L	1	-	-	3	-	-	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.00
Uranium	ug/L	0.02	85	10	20	10	-	20	-	30.6	15.4	14.1	73.5	37.2	18	19.3	6.35	329
Vanadium	ug/L	5	-	100	20	100	-	-	-	1.38	2.09	1.65	<1.00	<1.00	2.09	1.99	1.12	<5.00
Zinc	ug/L	4	150-2400(H)	5000(P)	3,000	5000(P)	-	-	5000	2.700	1.200	<1.0	<1.0	2.6	<1.0	<1.0	1.1	<5.0
Zirconium	ug/L	0.1	-	-	-	-	-	-	-	0.181	0.037	0.032	0.362	0.246	0.047	0.044	0.053	0.141
Inorganics																		
Bromide	mg/L	0.1	-	-	-	-	-	-	-	<1.00	<1.00	<1.00	<0.10	<0.10	0.18	0.2	<1.00	<1.00
Chloride	mg/L	1	1,500	100	250	-	100	-	250	297	232	250	31.9	279	286	337	9.27	361
Fluoride	mg/L	0.1	-	-	-	1	2	1.5	-	<1.00	<1.00	<1.00	0.57	0.86	0.67	0.63	1.49	<1.00
Nitrate (as N)	mg/L	0.01	400	-	10	-	-	10	-	0.894	1.54	1.32	0.041	0.421	2.02	1.75	<0.100	0.874
Nitrite (as N)	mg/L	0.01	0.2-2(C)	-	1,000	-	-	1	-	<0.100	<0.100	<0.100	<0.010	0.012	0.017	0.017	<0.100	<0.100
Phosphate (as P)	mg/L	0.005	-	-	-	-	-	-	-	<0.0500	<0.0500	<0.0500	<0.0050	<0.0050	<0.0050	<0.0050	0.068	<0.0500
Sulfate	mg/L	10	3090-4290(H)	-	500	-	-	-	500	183	109	108	416	204	122	133	292	4080
Hardness, Total (as CaCO3)	mg/L	0.125	-	-	-	-	-	-	-	589	474	474	1170	595	556	618	345	3100
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	-	10	-	-	-	623	533	533	962	611	554	587	414	650
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	623	533	533	962	611	554	587	414	650
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia, Total (as N)	mg/L	0.05	1.31-3.7(P)	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.05	<0.050
Carbon, Dissolved Organic	mg/L	0.5	-	-	-	-	-	-	-	5.2	3.38	3.52	11.2	4.98	6.17	4.2	1.03	12.1
Chemical Oxygen Demand	mg/L	20	-	-	-	-	-	-	-	<20	28	21	35	<20	<20	22	<20	38
Solids, Total Dissolved	mg/L	150	-	-	-	500	-	-	500	1160	986	1010	1610	1240	1080	1230	811	7170
pH	pH units	0.1	-	-	-	-	5-9.5	7.5-10.5	-	8.04	7.89	7.88	7.78	8.15	8.11	8.02	8.01	7.54
Field conductivity	µS/cm	0.1	-	-	-	700	-	-	-	2146	1663	1695	2306	2166	1928	2142	1308	7326

Notes:
1. Sample Location # provided for Figures 7A to 7G
Analytical Reports: CARO 22E3971, 22F0002, 22F2721, 22F0791, 22F1042, 22F2517, 22I3241, 22I3813, 22J0909, 22J0768, 22I4044
CSR - Contaminated Sites Regulation, BC Reg. 375/96; O.C. 1480/96, includes amendments up to BC Reg. 179/2021, July 7, 2021.
BCWQG- BC Water Quality Guidelines (Approved or Working)
AW- Standards/Guidelines for the protection of Aquatic Ecosystems (Freshwater)
IW- Standards/Guidelines for the protection of Irrigation water
DW - Standard for the protection of drinking water use
MAC: Maximum Allowable Concentration
AO: Aesthetic Objective

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Exceeds CSR -AW standards
Exceeds CSR-IW standards
Exceeds CSR-DW standards
Exceeds BCWQG IW (LT) for BCWQG IW (ST) Guideline or both
Exceeds CGDWQ (MAC) standard or CGDWQ (AO) standard and assessed GL28-1, GL28-2, and GL28-3 only
Monitoring locations GL12-1 and GL42-1 2022 analytical data concidered invalid due to surface water infiltration.

(P): pH dependent standard/guideline
(H): Hardness dependent standard/guideline
(C): Chloride dependent standard/guideline

Table 3: Summary of Groundwater Analytical Results - Monitoring Wells

SAMPLE ID DATE SAMPLED MATRIX Sampling Location # (Figures 7A to 7G) ¹			Provincial Standards and Guidelines					Federal Guidelines		Footprint Wells: Spring										Footprint Wells: Spring					
			BC CSR			BC WQG		Canadian Guidelines for Drinking Water Quality	GL2-1	GL2-2	GL4-1	GL4-2	GL5-2	GL16-1	GL17-1	GL20-1	GL12-1	GL27-1	GL27-3	GL29-1	GL29-2	GL35-3			
									2022-05-30	2022-05-30	2022-05-30	2022-05-30	2022-06-02	2022-06-02	2022-05-31	2022-05-31	2022-06-07	2022-05-31	2022-05-31	2022-06-06	2022-06-06	2022-05-31			
			AW	IW	DW	IW (LT)	IW(ST)*	MAC*	AO*	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water		
Dissolved Metals	Units	RDL																							
Aluminum	ug/L	5	-	5000	9,500	-	5000	100	-	1.5	<1.0	1.6	1,200	1.2	<5.0	<2.0	58.7	12.3	<2.0	<10.0	5.8	<5.0	5.7		
Antimony	ug/L	0.2	90	-	6	-	-	6	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.250	<0.100	0.483	<0.250	<0.100	<0.500	4.71	<0.250	<0.250		
Arsenic	ug/L	0.5	50	100	10	-	100	10	-	2.07	1.01	2.42	0.489	0.276	12.3	2.23	13.3	10.2	10.1	8.43	3.93	1.05	0.698		
Barium	ug/L	5	10,000	-	1,000	-	-	2000	-	60.6	97.9	14.2	29,700	45	16	205	183	29.2	459	7.79	98.3	25.2	15.2		
Beryllium	ug/L	0.1	1.5	100	8	100	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.020	<0.050	<0.050	0.033	<0.100	0.115	<0.050	0.09		
Bismuth	ug/L	0.1	-	-	-	-	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.020	<0.050	0.05	<0.020	<0.100	0.018	<0.050	<0.050		
Boron	ug/L	50	12,000	500	5,000	500	-	5000	-	7.7	6.5	11.4	19.2	24.8	76.5	83.1	1890	68	67.4	32.4	403	36.8	58.8		
Cadmium	ug/L	0.01	2.5-4(H)	5	5	-	5.1	7	-	<0.0050	0.033	<0.0140	<0.0340	0.018	0.024	<0.0040	0.012	<0.0100	<0.0080	<0.0200	0.055	0.043	0.018		
Calcium	ug/L	200	-	-	-	-	-	-	-	115000	108000	48500	41,700.0	59300	73500	17900	61200	484000	12600	366000	120000	374000	165000		
Chromium	ug/L	0.5	10	5	50	4.9	-	50	-	0.14	0.1	0.12	0.2	0.32	<0.50	<0.20	12.5	1.58	<0.20	<1.00	0.98	<0.50	<0.50		
Cobalt	ug/L	0.1	40	50	1	50	-	-	-	0.0241	0.0236	0.045	0.1	0.0178	0.198	0.111	12.5	6.16	<0.0100	1.47	286	0.119	<0.0250		
Copper	ug/L	0.4	40-90(H)	200	1,500	-	200	2000	1000	0.0214	3.990	0.130	1.1	0.610	1.390	<0.20	1.900	0.890	<0.20	1.070	13.600	2.010	<0.50		
Iron	ug/L	10	-	5000	6,500	-	-	-	300	954	56.2	586	6.3	<2.0	235	1620	19400	15500	683	3940	156	<10.0	12500		
Lead	ug/L	0.2	50-160(H)	200	10	-	200	5	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.250	<0.100	<0.250	<0.250	<0.100	<0.500	0.185	<0.250	<0.250		
Lithium	ug/L	0.1	-	2500	8	750	-	-	-	14.8	13.5	40.3	29.4	41.7	278	225	77.4	99	211	66.4	62	81.8	337		
Magnesium	ug/L	10	-	-	-	-	-	-	-	64000	56100	117000	161,000.0	89000	113000	20400	104000	609000	15400	1390000	61800	522000	371000		
Manganese	ug/L	0.2	-	200	1,500	-	-	120	20	112	135	75.5	19.6	0.23	153	49.6	409	13700	92.3	466	478	25.8	325		
Mercury	ug/L	0.01	0.25	1	1	-	2	1	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		
Molybdenum	ug/L	0.1	10,000	10	250	10	50	-	-	15.3	11.4	30	74.3	13	15.8	0.44	6.17	24.2	29.9	56	29.5	47.6	2.46		
Nickel	ug/L	0.4	650-1500(H)	200	80	200	-	-	-	0.066	0.131	0.292	1.5	0.232	0.779	0.307	30.000	25.000	0.144	2.900	39.200	4.070	0.540		
Phosphorus	ug/L	50	-	-	-	-	-	-	-	<10	<10	24	22.0	<10	53	86	2230	<50	126	106	62	<50	167		
Potassium	ug/L	100	-	-	-	-	-	-	-	4220	4050	6410	7,860.0	6570	16500	14900	136000	72600	13400	27900	18700	21400	26600		
Selenium	ug/L	0.5	20	20	10	-	10	50	-	<0.10	<0.10	<0.10	0.1	0.38	<0.50	<0.20	0.67	<0.50	<0.20	<1.00	0.93	0.56	<0.50		
Silicon	ug/L	1000	-	-	-	-	-	-	-	8110	8100	9370	7,030.0	7970	5360	5670	11900	14500	5510	8670	10400	8000	20500		
Silver	ug/L	0.05	0.5-15(H)	-	20	-	-	-	-	0.011	<0.010	<0.010	<0.010	<0.010	<0.050	<0.020	<0.050	0.114	<0.020	0.153	<0.010	0.051	0.051		
Sodium	ug/L	100	-	-	200,000	-	-	-	200,000	143000	111000	195000	225,000.0	189000	777000	656000	1660000	708000	700000	3980000	205000	1120000	1850000		
Strontium	ug/L	1	-	-	2,500	-	-	7000	-	3830	3680	2170	2,400.0	3870	15300	3810	1710	13000	2980	11100	2820	8870	7720		
Sulfur	ug/L	300	-	-	-	-	-	-	-	186000	148000	168000	152,000.0	97100	440000	<2000	86300	1420000	5390	4250000	69200	1760000	1100000		
Tellurium	ug/L	0.5	-	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.250	<0.100	<0.250	<0.250	<0.100	<0.500	<0.050	<0.250	<0.250		
Thallium	ug/L	0.02	3	-	-	-	-	-	-	<0.0040	<0.0040	<0.0040	0.0	<0.0040	<0.0200	<0.0080	<0.0200	<0.0200	<0.0080	<0.0400	<0.0040	<0.0200	<0.0200		
Thorium	ug/L	0.1	-	-	-	-	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.020	<0.050	<0.050	<0.020	<0.100	0.034	<0.050	<0.050		
Tin	ug/L	0.2	-	-	2,500	-	-	-	-	<0.050	0.06	<0.050	<0.050	<0.050	<0.250	<0.100	2.68	<0.250	<0.100	<0.500	0.141	<0.250	<0.250		
Titanium	ug/L	5	1,000	-	-	-	-	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	<1.00	<0.40	42.4	<1.00	<0.40	<2.00	0.77	<1.00	<1.00		
Tungsten	ug/L	1	-	-	3	-	-	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	1.02	<0.40	<1.00	<1.00	1.36	<2.00	2.93	<1.00	<1.00		
Uranium	ug/L	0.02	85	10	20	10	-	20	-	3.33	2.8	40.1	69.6	28.5	6.34	0.112	14.2	212	0.566	53.1	40.7	201	20.3		
Vanadium	ug/L	5	-	100	20	100	-	-	-	<1.00	<1.00	<1.00	<1.00	3.65	<5.00	<2.00	14.8	<5.00	<2.00	<10.0	<3.00	<5.00	<5.00		
Zinc	ug/L	4	150-2400(H)	5000(P)	3,000	5000(P)	-	-	5000	<1.0	<1.0	<1.0	1.3	<1.0	<5.0	<2.0	<5.0	<5.0	<2.0	<10.0	4.300	<5.0	<5.0		
Zirconium	ug/L	0.1	-	-	-	-	-	-	-	<0.020	<0.020	0.064	0.3	0.023	0.333	1.24	13.3	1.54	2.1	0.256	2.72	<0.100	3.81		
Inorganics																									
Bromide	mg/L	0.1	-	-	-	-	-	-	-	<0.10	<0.10	<0.10	<0.10	<1.00	<1.00	<0.10	<1.00	<1.00	<0.10	1.57	<1.00	<1.00	<1.00		
Chloride	mg/L	1	1,500	100	250	-	100	-	250	90.5	68.1	18.8	36.4	173	130	65.6	370	559	36.8	585	71.2	220	344		
Fluoride	mg/L	0.1	-	-	-	1	2	1.5	-	0.5	0.55	1.83	2.6	<1.00	<1.00	2.04	<1.00	1.05	3.3	<1.00	<1.00	1.21	<1.00		
Nitrate (as N)	mg/L	0.01	400	-	10	-	-	10	-	<0.100	<0.100	<0.100	<0.100	<0.100	0.137	<0.010	<0.100	<0.010	<1.00	3.01	<0.100	<0.100	<0.100		
Nitrite (as N)	mg/L	0.01	0.2-2(C)	-	1,000	-	-	1	-	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100	<0.010	<0.100	<0.100	<0.010	<0.100	<0.100	<0.100	<0.100		
Phosphate (as P)	mg/L	0.005	-	-	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0500	<0.0500	<0.0050	<0.0500	<0.0500	<0.0050	<0.0500	<0.0500	<0.0500	<0.0500		
Sulfate	mg/L	10	3090-4290(H)	-	500	-	-	-	500	573	465	507	440.0	291	1410	1.9	251	3910	13.2	10300	213	5030	2940		
Hardness, Total (as CaCO3)	mg/L	0.125	-	-	-	-	-	-	-	550	502	604	767.0	515	651	129	583	3720	95.2	6640	555	3090	1940		
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	-	10	-	-	-	201	233	520	719.0	425	833	1220	3130	685	1270	479	590	293	1530		
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	201	233	520	719.0	425	833	1220	3130	685	1270	479	590	293	1530		
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Ammonia, Total (as N)	mg/L	0.05	1.31-3.7(P)	-	-	-	-	-	-	0.075	0.085	0.134	<0.050	<0.050	0.118	0.3	70.4	6.91	0.242	0.933	0.09	<0.050	1.36		
Carbon, Dissolved Organic	mg/L	0.5	-	-	-	-	-	-	-	2.97	2.93	3.62	5.3	2.57	1.98	1.98	113	199	2.52	8.76	67	13.7	5.42		
Chemical Oxygen Demand	mg/L	20	-	-	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	283	563	<20	<20	188	39	<20</		

Notes:	
1. Sample Location # provided for Figures 7A to 7G	
Analytical Reports: CARO 22E3971, 22F0002, 22F2721, 22F0791, 22F1042, 22F2517, 22I3241, 22I3813, 22J0909, 22J0768, 22I4044	
CSR - Contaminated Sites Regulation, BC Reg. 375/96; O.C. 1480/96, includes amendments up to BC Reg. 179/2021, July 7, 2021.	
BCWQG- BC Water Quality Guidelines (Approved or Working)	
AW-Standards/Guidelines for the protection of Aquatic Ecosystem (Freshwater)	
IW- Standards/Guidelines for the protection of Irrigation water	
DW - Standard for the protection of drinking water use	
MAC: Maximum Allowable Concentration	
AO: Aesthetic Objective	

Table 3: Summary of Groundwater Analytical Results - Monitoring Wells

SAMPLE ID DATE SAMPLED MATRIX Sampling Location # (Figures 7A to 7G) ¹			Provincial Standards and Guidelines					Federal Guidelines		Footprint Wells: Fall									
			BC CSR			BC WQG		Canadian Guidelines for Drinking Water Quality		GL2-1	GL2-2	GL4-1	GL4-2	GL17-1	GL20-1	GL12-1	GL27-1	GL29-1	GL29-2
			AW	IW	DW	IW (LT)	IW(ST)*	MAC*	AO*	2022-09-27	2022-09-27	2022-09-27	2022-09-27	2022-09-28	2022-09-27	2022-10-05	2022-09-27	2022-10-06	2022-10-05
										Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
										24	25	26	27	28	29	30	31	32	33
Dissolved Metals	Units	RDL																	
Aluminum	ug/L	5	-	5000	9,500	-	5000	100	-	<1.0	<1.0	<1.0	<1.0	2.1	71.2	12.6	<2.0	<7.0	<5.0
Antimony	ug/L	0.2	90	-	6	-	-	6	-	<0.050	<0.050	<0.050	<0.050	<0.100	0.495	<0.250	<0.100	4.08	<0.250
Arsenic	ug/L	0.5	50	100	10	-	100	10	-	1.92	1.4	2.44	0.55	2.16	10.8	16.5	9.06	3.84	1.11
Barium	ug/L	5	10,000	-	1,000	-	-	2000	-	70	96.8	16.2	36.8	235	200	27.8	467	90.1	20.8
Beryllium	ug/L	0.1	1.5	100	8	100	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	0.057	0.036	0.148	<0.050
Bismuth	ug/L	0.1	-	-	-	-	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.050	<0.020	0.011	<0.050
Boron	ug/L	50	12,000	500	5,000	500	-	5000	-	9.6	8.4	12.4	21.7	84.9	2800	57.1	73.5	366	23.1
Cadmium	ug/L	0.01	2.5-4(H)	5	5	-	5.1	7	-	<0.0050	0.0699	<0.0100	<0.0200	<0.0040	0.0726	<0.0100	<0.0040	0.0669	0.236
Calcium	ug/L	200	-	-	-	-	-	-	-	136000	119000	55300	48200	21500	62900	456000	15100	118000	369000
Chromium	ug/L	0.5	10	5	50	4.9	-	50	-	0.14	0.17	0.17	0.18	<0.20	15.2	1.97	0.23	0.98	<0.50
Cobalt	ug/L	0.1	40	50	1	50	-	-	-	0.0275	0.0471	0.0253	0.583	0.148	12.8	5.84	<0.0100	310	0.21
Copper	ug/L	0.4	40-90(H)	200	1,500	-	200	2000	1000	0.64	0.7	<0.10	0.57	0.3	0.6	0.64	<0.20	14.8	1.78
Iron	ug/L	10	-	5000	6,500	-	-	-	300	1020	126	687	57.1	1870	10200	21000	625	121	22.3
Lead	ug/L	0.2	50-160(H)	200	10	-	200	5	-	<0.050	<0.050	<0.050	<0.050	<0.100	<0.250	<0.250	<0.100	0.205	<0.250
Lithium	ug/L	0.1	-	2500	8	750	-	-	-	14.8	12.7	36.3	28	231	79.9	107	216	57	78.9
Magnesium	ug/L	10	-	-	-	-	-	-	-	64400	57500	116000	153000	15700	82500	553000	12800	61700	485000
Manganese	ug/L	0.2	-	200	1,500	-	-	120	20	119	311	72.7	228	49.9	256	12400	82.9	469	432
Mercury	ug/L	0.01	0.25	1	1	-	2	1	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	ug/L	0.1	10,000	10	250	10	50	-	-	15.9	15.6	29.2	76.5	0.497	3.49	21.4	34.4	29.7	56.6
Nickel	ug/L	0.4	650-1500(H)	200	80	200	-	-	-	0.073	0.601	0.255	1.88	0.342	25.2	22.6	<0.080	48	11.4
Phosphorus	ug/L	50	-	-	-	-	-	-	-	<10	<10	19	25	71	2780	61	108	62	<50
Potassium	ug/L	100	-	-	-	-	-	-	-	4490	4250	6660	8200	15400	136000	65000	13000	16600	19400
Selenium	ug/L	0.5	20	20	10	-	10	50	-	<0.10	<0.10	<0.10	0.11	<0.20	0.7	<0.50	1.46	1.02	0.55
Silicon	ug/L	1000	-	-	-	-	-	-	-	9380	9240	10600	8080	5750	14800	14100	5710	10600	7780
Silver	ug/L	0.05	0.5-15(H)	-	20	-	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.050	<0.020	<0.010	<0.050
Sodium	ug/L	100	-	-	200,000	-	-	-	200,000	146000	111000	196000	220000	565000	1470000	606000	611000	201000	997000
Strontium	ug/L	1	-	-	2,500	-	-	7000	-	4180	3840	2420	2670	4110	1510	11900	3130	2750	8480
Sulfur	ug/L	300	-	-	-	-	-	-	-	227000	165000	194000	177000	<2000	48900	1260000	6480	71400	1690000
Tellurium	ug/L	0.5	-	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.100	<0.250	<0.250	<0.100	<0.050	<0.250
Thallium	ug/L	0.02	3	-	-	-	-	-	-	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	<0.0200	0.0251	<0.0080	0.006	<0.0200
Thorium	ug/L	0.1	-	-	-	-	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.050	<0.020	0.016	<0.050
Tin	ug/L	0.2	-	-	2,500	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.100	3.46	<0.250	<0.100	0.076	<0.250
Titanium	ug/L	5	1,000	-	-	-	-	-	-	<0.20	<0.20	<0.20	<0.20	<0.40	59.9	1.23	<0.40	0.72	<1.00
Tungsten	ug/L	1	-	-	3	-	-	-	-	<0.20	<0.20	<0.20	0.26	<0.40	<1.00	<1.00	1.37	2.9	<1.00
Uranium	ug/L	0.02	85	10	20	10	-	20	-	3.61	3.05	45.6	83.1	0.0954	5.86	212	0.687	45.1	195
Vanadium	ug/L	5	-	100	20	100	-	-	-	<1.00	<1.00	<1.00	<1.00	<2.00	16.1	<5.00	<2.00	2.35	<5.00
Zinc	ug/L	4	150-2400(H)	5000(P)	3,000	5000(P)	-	-	5000	<1.0	<1.0	<1.0	1.1	<2.0	<5.0	<5.0	<2.0	4	<5.0
Zirconium	ug/L	0.1	-	-	-	-	-	-	-	<0.020	<0.020	0.067	0.288	1.46	14	1.53	2.32	2.84	<0.100
Inorganics																			
Bromide	mg/L	0.1	-	-	-	-	-	-	-	0.65	0.48	<0.10	<0.10	0.35	2.11	<10.0	<0.10	<0.10	<1.00
Chloride	mg/L	1	1,500	100	250	-	100	-	250	101	70.6	18.2	41.6	70.9	399	598	37.6	0.62	232
Fluoride	mg/L	0.1	-	-	-	1	2	1.5	-	0.54	0.61	1.97	2.82	2.12	<1.00	<10.0	3.51	<0.10	1.5
Nitrate (as N)	mg/L	0.01	400	-	10	-	-	10	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.100	<1.00	<0.010	<0.010	<0.100
Nitrite (as N)	mg/L	0.01	0.2-2(C)	-	1,000	-	-	1	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.165	<1.00	<0.010	<0.010	<0.100
Phosphate (as P)	mg/L	0.005	-	-	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0088	1.46	<0.500	<0.0050	<0.0050	<0.0500
Sulfate	mg/L	10	3090-4290(H)	-	500	-	-	-	500	632	473	551	488	<1.0	172	3870	17.3	2	4710
Hardness, Total (as CaCO3)	mg/L	0.125	-	-	-	-	-	-	-	604	534	618	749	118	497	3420	90.3	548	2920
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	-	10	-	-	-	227	275	575	823	1450	2820	815	1570	617	316
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	227	275	575	823	1450	2820	815	1570	617	316
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia, Total (as N)	mg/L	0.05	1.31-3.7(P)	-	-	-	-	-	-	0.058	<0.050	0.101	<0.050	0.347	85.7	7.96	0.241	0.118	<0.050
Carbon, Dissolved Organic	mg/L	0.5	-	-	-	-	-	-	-	1.93	1.52	2.23	3.62	0.98	89	182	1.71	85.4	14.8
Chemical Oxygen Demand	mg/L	20	-	-	-	-	-	-	-	<20	<20	<20	<20	<20	369	613	<20	217	40
Solids, Total Dissolved	mg/L	150	-	-	-	500	-	-	500	1220	998	1300	1410	1520	4510	7490	1600	1240	7680
pH	pH units	0.1	-	-	-	-	5-9.5	7.5-10.5	-	7.89	7.99	8.1	7.99	8.15	7.63	7.14	8.19	7.88	7.72
Field conductivity	µS/cm	0.1	-	-	-	700	-	-	-	1689	1468	1830	2123	2184	7925	7795	2575	1769	7809

Notes:
1. Sample Location # provided for Figures 7A to 7G
Analytical Reports: CARO 22E3971, 22F0002, 22F2721, 22F0791, 22F1042, 22F2517, 22I32341, 22I3813, 22J0909, 22J0768, 22I4044
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IW- Standards/Guidelines for the protection of Irrigation water
DW - Standard for the protection of drinking water use
MAC: Maximum Allowable Concentration
AO: Aesthetic Objective

Bold
Underline
Shade
Red text
*

Exceeds CSR -AW standards
Exceeds CSR-IW standards
Exceeds CSR-DW standards
Exceeds BCWQG IW (LT) or BCWQG IW (ST) Guideline or both
Exceeds CGDWQ (MAC) standard or CGDWQ (AO) standard and assessed GL28-1, GL28-2, and GL28-3 only
Monitoring locations GL12-1 and GL42-1 2022 analytical data concidered invalid due to surface water infiltration.

(P): pH dependent standard/guideline
(H): Hardness dependent standard/guideline
(C): Chloride dependent standard/guideline

Table 3: Summary of Groundwater Analytical Results - Monitoring Wells

SAMPLE ID DATE SAMPLED MATRIX Sampling Location # (Figures 7A to 7G) ¹			Provincial Standards and Guidelines					Federal Guidelines		Downgradient Wells: Spring										Downgradient Wells: Fall				
			BC CSR			BC WQG		Canadian Guidelines for Drinking Water Quality		GL42-1	GL42-2	GL39-1	GL39-2	GL28-1	GL28-2	GL28-3	09BH03	09BH06-D	GL39-1	GL39-2	GL28-1	GL28-2	GL28-3	
			AW	IW	DW	IW (LT)	IW(ST)*			2022-06-07	2022-06-17	2022-05-31	2022-05-31	2022-06-02	2022-06-02	2022-06-02	2022-06-06	2022-06-02	2022-09-23	2022-09-23	2022-10-06	2022-10-06	2022-10-06	
								Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
								MAC*	AO*	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
Dissolved Metals	Units	RDL																						
Aluminum	ug/L	5	-	5000	9,500	-	5000	100	-	<5.0	<5.0	2	1.1	1.3	1.1	<100	<2.0	1.4	6.8	1.2	<6.0	<6.0	<5.0	
Antimony	ug/L	0.2	90	-	6	-	-	6	-	<0.250	0.904	<0.100	0.059	0.382	<0.050	<5.00	<0.100	<0.050	<0.100	0.073	0.148	<0.100	<0.250	
Arsenic	ug/L	0.5	50	100	10	-	100	10	-	4.37	1.05	0.328	0.324	1.08	0.367	13*	0.373	3	0.275	0.345	0.865	0.326	0.721	
Barium	ug/L	5	10,000	-	1,000	-	-	2000	-	580	40.5	11.9	9.76	18.3	12.4	349	17.7	39.2	10.4	10.8	11.4	11.8	15.8	
Beryllium	ug/L	0.1	1.5	100	8	100	-	-	-	<0.050	<0.050	<0.020	<0.010	<0.010	<0.010	<1.00	<0.020	<0.010	0.021	<0.010	<0.020	<0.020	<0.050	
Bismuth	ug/L	0.1	-	-	-	-	-	-	-	<0.050	<0.050	<0.020	<0.010	<0.010	<0.010	<1.00	0.025	<0.010	<0.020	<0.010	<0.020	<0.020	<0.050	
Boron	ug/L	50	12,000	500	5,000	500	-	5000	-	73.1	34.8	13.7	6.7	15.1	16.4	221	10.1	10.4	14.3	7.5	17.9	18.6	<10.0	
Cadmium	ug/L	0.01	2.5-4(H)	5	5	-	5.1	7	-	<0.0100	0.158	0.060	<0.0180	0.207	0.062	1.830	<0.0120	0.004	0.0635	<0.0200	0.0613	0.067	0.194	
Calcium	ug/L	200	-	-	-	-	-	-	-	24000	109000	237000	87200	193000	277000	6130000	116000	44900	235000	75100	221000	319000	330000	
Chromium	ug/L	0.5	10	5	50	4.9	-	50	-	<0.50	0.97	0.24	0.69	0.2	0.21	<10.0	10.9	0.1	0.29	0.51	<0.20	0.21	<0.50	
Cobalt	ug/L	0.1	40	50	1	50	-	-	-	0.444	0.177	0.173	0.0645	0.633	0.298	2.26	0.093	0.136	0.14	0.0652	0.984	0.247	0.15	
Copper	ug/L	0.4	40-90(H)	200	1,500	-	200	2000	1000	<0.50	2.690	1.880	1.560	1.830	0.880	116.000	2.060	0.630	1.56	1.52	1	4.05	2.05	
Iron	ug/L	10	-	5000	6,500	-	-	-	300	1820	<10.0	<4.0	<2.0	6.8	<2.0	<200	<4.0	378	<4.0	<2.0	190	<4.0	<10.0	
Lead	ug/L	0.2	50-160(H)	200	10	-	200	5	-	<0.250	<0.250	<0.100	<0.050	<0.050	<0.050	<5.00	<0.100	<0.050	<0.100	<0.050	<0.100	<0.100	<0.250	
Lithium	ug/L	0.1	-	2500	8	750	-	-	-	861	121	76.4	15.8	78.6	61.1	1010	20.2	42.6	66.5	14	73.2	48.1	40.9	
Magnesium	ug/L	10	-	-	-	-	-	-	-	20000	271000	492000	206000	289000	299000	9520000	147000	47300	399000	130000	316000	284000	505000	
Manganese	ug/L	0.2	-	200	1,500	-	-	120	20	139	207	13.4	4.07	154*	20.4*	364*	<0.100	162	11.4	3.65	279*	15.5	120*	
Mercury	ug/L	0.01	0.25	1	1	-	2	1	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum	ug/L	0.1	10,000	10	250	10	50	-	-	3.24	18.2	20.3	23.1	12.3	5.43	246	23.4	18.9	21.2	34.4	12.3	5.29	13.2	
Nickel	ug/L	0.4	650-1500(H)	200	80	200	-	-	-	1.580	7.830	1.050	0.813	3.490	2.210	90.900	0.780	0.292	0.739	0.684	2.61	2.26	8.5	
Phosphorus	ug/L	50	-	-	-	-	-	-	-	<50	<50	<20	<10	33	<10	<1000	<20	31	<20	<10	<20	<20	<50	
Potassium	ug/L	100	-	-	-	-	-	-	-	8870	9090	13900	5320	10400	11500	212000	6080	3790	14700	6130	10500	12900	11700	
Selenium	ug/L	0.5	20	20	10	-	10	50	-	<0.50	0.64	4.69	0.83	0.37	0.62	<10.0	46.1	<0.10	5.09	0.44	<0.20	0.6	<0.50	
Silicon	ug/L	1000	-	-	-	-	-	-	-	7890	7040	10500	8030	9660	12100	212000	10200	11500	10300	8710	10200	12500	11000	
Silver	ug/L	0.05	0.5-15(H)	-	20	-	-	-	-	0.053	<0.050	0.036	0.014	0.015	0.014	<1.00	0.028	<0.010	<0.020	<0.010	<0.020	<0.020	<0.050	
Sodium	ug/L	100	-	-	200,000	-	-	-	200,000	1180000	1250000	571000	412000	392000*	886000*	22800000*	460000	128000	483000	329000	386000*	806000*	1170000*	
Strontium	ug/L	1	-	-	2,500	-	-	7000	-	2740	6010	7110	2130	5540	7270*	160000*	2560	1300	6780	1740	6100	7240*	8610*	
Sulfur	ug/L	300	-	-	-	-	-	-	-	8860	963000	943000	407000	720000	1140000	29800000	414000	93300	917000	347000	741000	1100000	1590000	
Tellurium	ug/L	0.5	-	-	-	-	-	-	-	<0.250	<0.250	<0.100	<0.050	<0.050	<0.050	<5.00	<0.100	<0.050	<0.100	<0.050	<0.100	<0.100	<0.250	
Thallium	ug/L	0.02	3	-	-	-	-	-	-	<0.0200	0.083	0.0149	<0.0040	0.0243	0.0072	<0.400	<0.0080	<0.0040	0.0237	0.0066	0.013	<0.0080	0.0324	
Thorium	ug/L	0.1	-	-	-	-	-	-	-	<0.050	<0.050	<0.020	<0.010	<0.010	<0.010	<1.00	<0.020	<0.010	<0.020	<0.010	<0.020	<0.020	<0.050	
Tin	ug/L	0.2	-	-	2,500	-	-	-	-	<0.250	<0.250	<0.100	<0.050	<0.050	<0.050	6.26	<0.100	<0.050	<0.100	<0.050	<0.100	<0.100	<0.250	
Titanium	ug/L	5	1,000	-	-	-	-	-	-	<1.00	<1.00	<0.40	<0.20	<0.20	<0.20	<20.0	<0.40	<0.20	<0.40	<0.20	<0.40	<0.40	<1.00	
Tungsten	ug/L	1	-	-	3	-	-	-	-	<1.00	<1.00	<0.40	<0.20	<0.20	<0.20	<20.0	<0.40	<0.20	<0.40	<0.20	<0.40	<0.40	<1.00	
Uranium	ug/L	0.02	85	10	20	10	-	20	-	1.47	122	244	64.4	122*	177*	4950*	140	5.81	240	50.7	133*	192*	278*	
Vanadium	ug/L	5	-	100	20	100	-	-	-	<5.00	<5.00	<2.00	<1.00	1.5	<1.00	<100	<2.00	<1.00	<2.00	<1.00	<2.00	<2.00	<5.00	
Zinc	ug/L	4	150-2400(H)	5000(P)	3,000	5000(P)	-	-	5000	<5.0	<5.0	<2.0	<1.0	1.800	<1.0	<100	<2.0	<1.0	<2.0	<1.0	<2.0	<2.0	<5.0	
Zirconium	ug/L	0.1	-	-	-	-	-	-	-	9.02	0.794	0.075	0.021	0.241	0.078	10.7	0.132	<0.020	<0.040	<0.020				

Table 4: Summary of Surface Water Analytical Results

DESCRIPTION			BC Water Quality Guidelines				Slough#2				Bubna Slough					
CLIENT ID	DATE SAMPLED	MATRIX					Slough #2	Slough #2	Slough #2	Slough #2	Bubna Slough	Bubna Slough	Bubna Slough	Bubna Slough		
Sampling Location # (Figures 8A to 8I)¹			Units	RDL	AW-LT	AW-ST	IW-LT	IW-ST	2022-03-23	2022-06-21	2022-09-12	2022-10-19	2022-03-23	2022-06-21	2022-09-12	2022-10-19
									Water	Water	Water	Water	Water	Water	Water	Water
Total Metals																
Aluminum	ug/L	5	50 (Eq)	100 (Eq)	-	5000	53.7	17.9	28.2	27	7.8	3.9	3.2	5.3		
Antimony	ug/L	0.2	-	-	-	-	0.256	0.352	0.334	0.289	0.085	0.125	0.125	0.115		
Arsenic	ug/L	0.5	-	5	-	100	3.37	4.27	5.5	5.05	1.08	1.54	1.6	1.5		
Barium	ug/L	5	-	-	-	-	27.3	5.25	27	25.3	16.4	7.06	11.9	9.47		
Beryllium	ug/L	0.1	-	-	100	-	<0.010	<0.020	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010		
Bismuth	ug/L	0.1	-	-	-	-	<0.010	<0.020	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010		
Boron	ug/L	50	1200	-	500	-	10.9	18.5	18.7	18	17.1	26.3	40	34		
Cadmium	ug/L	0.01	0.708 - 1.796 (Eq)	3.19 - 11.75 (Eq)	-	5.1	0.0051	0.0045	0.0048	<0.0100	0.0025	<0.0020	<0.0020	<0.0020		
Calcium	ug/L	200	-	-	-	-	44100	41300	35000	30500	41600	35200	29100	28100		
Chromium	ug/L	0.5	-	-	4.9	-	0.33	0.26	0.22	<0.50	0.18	0.13	0.18	0.15		
Cobalt	ug/L	0.1	4	110	50	-	0.249	0.171	0.145	0.145	0.043	0.0424	0.0329	0.0437		
Copper	ug/L	0.4	6.43 -26 (Eq)	35.6-141 (Eq)	-	200	0.8	<0.40	0.27	<1.00	0.69	<0.20	<0.20	<0.20		
Iron	ug/L	10	-	350	-	-	92.9	34.3	68.6	56.7	14.9	7.2	3.7	6.7		
Lead	ug/L	0.2	-	-	-	200	0.112	0.181	0.078	<0.250	0.051	0.079	<0.050	<0.050		
Lithium	ug/L	0.1	-	-	750	-	74.6	106	141	117	40.2	61.4	88.7	73.9		
Magnesium	ug/L	10	-	-	-	-	98800	131000	160000	168000	105000	164000	210000	247000		
Manganese	ug/L	0.2	2,879.8-8,657 (Eq)	6,237.34-20,706.6 (Eq)	-	-	114	67	28.6	27.9	6.76	7.96	10.7	4.74		
Mercury	ug/L	0.01	-	-	-	2	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		
Molybdenum	ug/L	0.1	7600	46000	10	50	3.62	5.28	5.98	6.58	1.28	1.38	1.15	1.26		
Nickel	ug/L	0.4	150(Eq)	-	200	-	1.1	1.12	1.13	1.3	0.49	0.452	0.432	0.504		
Phosphorus	ug/L	50	-	-	-	-	128	58	438	124	21	18	12	22		
Potassium	ug/L	100	-	-	-	-	59200	80900	98500	104000	15500	26100	30100	33300		
Selenium	ug/L	0.5	2	-	-	10	0.14	<0.20	0.25	<0.50	0.15	0.11	0.1	0.1		
Silicon	ug/L	1000	-	-	-	-	4720	7780	13100	11000	3160	6240	17500	17400		
Silver	ug/L	0.05	1.5(Eq)	3(Eq)	-	-	<0.010	<0.020	<0.010	<0.050	<0.010	0.01	<0.010	0.013		
Sodium	ug/L	100	-	-	-	-	660000	889000	1090000	1260000	205000	304000	377000	447000		
Strontium	ug/L	1	-	-	-	-	1120	1190	1300	1250	1730	1500	1230	1380		
Sulfur	ug/L	300	-	-	-	-	276000	384000	479000	487000	40100	62300	71800	79300		
Tellurium	ug/L	0.5	-	-	-	-	<0.050	<0.100	<0.050	<0.250	<0.050	<0.050	<0.050	<0.050		
Thallium	ug/L	0.02	-	-	-	-	<0.0040	<0.0080	<0.0040	<0.0200	<0.0040	<0.0040	<0.0040	<0.0040		
Thorium	ug/L	0.1	-	-	-	-	0.013	<0.020	0.016	<0.050	<0.010	<0.010	<0.010	<0.010		
Tin	ug/L	0.2	-	-	-	-	<0.050	<0.100	<0.050	<0.250	<0.050	<0.050	<0.050	<0.050		
Titanium	ug/L	5	-	-	-	-	3.06	0.97	1.63	1.86	0.28	0.26	<0.20	0.31		
Tungsten	ug/L	1	-	-	-	-	<0.20	<0.40	<0.20	<1.00	<0.20	<0.20	<0.20	<0.20		
Uranium	ug/L	0.02	8.5	-	10	-	18.3	24.9	25.5	30.5	6.15	4.93	3.53	4.66		
Vanadium	ug/L	5	-	-	100	-	1.52	<2.00	<1.00	<5.00	4.23	<1.00	<1.00	<1.00		
Zinc	ug/L	4	327.75-1,312.5(Eq)	353.25-1,338(Eq)	5000(P)	-	2	<2.0	2.5	<5.0	1.5	<1.0	<1.0	<1.0		
Zirconium	ug/L	0.1	-	-	-	-	0.568	0.318	0.313	0.348	0.061	0.031	<0.020	0.035		
Copper, dissolved	ug/L	0.5					0.52	<0.20	<0.50	<0.20	0.32	<0.10	<0.10	<0.10		
Inorganics																
Bromide	mg/L	0.1	-	-	-	-	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00		
Chloride	mg/L	1	150	600	-	100	363	643	778	759	301	552	668	665		
Fluoride	mg/L	0.1	-	1.99-2.5(Eq)	1	2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00		
Nitrate (as N)	mg/L	0.01	3	32.8	-	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100		
Nitrite (as N)	mg/L	0.01	0.2(Eq)	0.6(Eq)	-	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100		
Phosphate (as P)	mg/L	0.005	-	-	-	-	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500		
Sulfate	mg/L	10	429(Eq)	-	-	-	661	1160	1380	1410	97.7	185	217	220		
Hardness, Total (as CaCO3)	mg/L	0.125	-	-	-	-	517	642	745	767	538	765	938	1090		
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	10	-	651	904	973	910	442	687	744	708		
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	-	-	-	-	46.9	82.7	98.4	78.4	10.8	30.2	14.3	55.8		
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	-	-	557	738	776	754	420	626	715	597		
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	-	-	93.9	165	197	157	21.6	60.4	28.6	112		
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Ammonia, Total (as N)	mg/L	0.05	0.102-0.453(P&T)	0.688-2.36(P&T)	-	-	0.189	0.622	0.535	1.28	<0.050	<0.050	0.233	0.384		
Carbon, Dissolved Organic	mg/L	0.5	-	-	-	-	25.5	35.9	45.3	47.8	9.27	22.6	25.9	24		
Chemical Oxygen Demand	mg/L	20	-	-	-	-	75	110	113	110	42	74	77	71		
Solids, Total Dissolved	mg/L	150	-	-	-	-	2380	3680	3880	4000	1080	1850	1930	2040		
Nitrogen, Total Kjeldahl	mg/L	0.05	-	-	-	-	1.76	2.99	3.19	3.9	0.518	1.71	1.54	1.81		
Phosphorus, Total (as P)	mg/L	0.005	-	0.005	-	-	0.0566	0.0582	0.148	0.0799	0.023	0.0235	0.02	0.0185		
Conductivity (EC)	uS/cm	2	-	-	-	-	3690	5170	5730	5920	1860	2900	3270	3340		
Coliforms, Total (Q-Tray)	PN/100 mL	1	-	-	-	-	130	> 2420	> 24200	4750	33	> 2420	9800	2030		
Coliforms, Fecal (Q-Tray)	PN/100 mL	1	-	-	-	-	<1	38	2	5	<1	53	84	8		
Nitrate+Nitrite (as N)	mg/L	0.01					<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100		
Nitrogen, Total	mg/L	0.05					1.76	2.99	3.19	3.9	0.518	1.71	1.54	1.81		
pH	pH units	0.1	-	6.5-9	-	5-9.5	8.62	8.69	8.77	8.65	8.42	8.48	8.52	8.54		
Field conductivity	µS/cm	0.1	-	-	700	-	3548	5057	5889	5950	1427	3023	3371	3403		

Notes:

1. Sample Location # provided for Figures 8A to 8I

Analytical Report: CARO 22c3134, 22c3349

BCWQG- BC Water Quality Guidelines (Approved or Working)

AW-Standards/Guidelines for the protection of Aquatic Ecosystem (Freshwater)

IW- Standards/Guidelines for the protection of Irrigation water

Bold	Exceeds BCWQG AW (LT) Guideline
<u>Underline</u>	Exceeds BCWQG AW (ST) Guideline
Shade	Exceeds BCWQG IW (LT) Guideline
Red text	Exceeds BCWQG IW (ST) Guideline

(Eq): Based on given equation

(P): pH dependent standard/guideline

(T): Temperature dependent standard/guideline

Table 4: Summary of Surface Water Analytical Results

DESCRIPTION			BC Water Quality Guidelines				NE Pond				Bredin Pond			
							NE Pond	NE Pond	NE Pond	NE Pond	Bredin Pond	Bredin Pond	Bredin Pond	Bredin Pond
CLIENT ID							2022-03-22	2022-06-21	2022-09-12	2022-10-19	2022-03-22	2022-06-21	2022-09-12	2022-10-19
DATE SAMPLED							Water	Water	Water	Water	Water	Water	Water	Water
MATRIX							9	10	11	12	13	14	15	16
Sampling Location # (Figures 8A to 8I)¹	Units	RDL	AW-LT	AW-ST	IW-LT	IW-ST								
Total Metals														
Aluminum	ug/L	5	50 (Eq)	100 (Eq)	-	5000	114	58.2	210	198	86.5	13.4	6.9	30.5
Antimony	ug/L	0.2	-	-	-	-	<0.250	0.172	0.236	0.199	<0.250	0.107	0.127	0.123
Arsenic	ug/L	0.5	-	5	-	100	2	3.71	4.11	3.49	0.699	1.59	1.79	1.55
Barium	ug/L	5	-	-	-	-	86.3	94.6	119	123	104	71.7	110	103
Beryllium	ug/L	0.1	-	-	100	-	<0.050	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010
Bismuth	ug/L	0.1	-	-	-	-	<0.050	<0.010	<0.010	0.015	<0.050	<0.010	<0.010	<0.010
Boron	ug/L	50	1200	-	500	-	49	70.7	57.3	49	30.1	35.7	43.5	36.6
Cadmium	ug/L	0.01	0.708 - 1.796 (Eq)	3.19 - 11.75 (Eq)	-	5.1	0.0147	<0.0080	<0.0080	0.0102	<0.0100	<0.0060	<0.0040	<0.0060
Calcium	ug/L	200	-	-	-	-	47200	52500	16600	19400	42600	47500	21400	25800
Chromium	ug/L	0.5	-	-	4.9	-	<0.50	0.27	0.66	0.65	0.78	0.27	0.26	0.31
Cobalt	ug/L	0.1	4	110	50	-	0.455	0.368	0.415	0.397	0.147	0.161	0.128	0.139
Copper	ug/L	0.4	6.43 -26 (Eq)	35.6-141 (Eq)	-	200	<1.00	0.9	0.66	0.85	<1.00	0.56	0.23	0.32
Iron	ug/L	10	-	350	-	-	151	65.5	296	292	76.7	16.6	9.8	40.8
Lead	ug/L	0.2	-	-	-	200	<0.250	0.121	0.19	0.196	<0.250	0.066	<0.050	<0.050
Lithium	ug/L	0.1	-	-	750	-	36.1	33.3	57.4	42	28.7	27.8	35.2	32
Magnesium	ug/L	10	-	-	-	-	209000	197000	266000	292000	132000	123000	159000	169000
Manganese	ug/L	0.2	2,879.8-8,657 (Eq)	6,237.34-20,706.6 (Eq)	-	-	214	113	54.2	46.1	48.3	45.6	48.4	38
Mercury	ug/L	0.01	-	-	-	2	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	ug/L	0.1	7600	46000	10	50	25.7	26	24.4	31.3	12.3	15.6	14	15.1
Nickel	ug/L	0.4	150(Eq)	-	200	-	3.41	2.9	3.18	3.64	1.04	1.22	1.25	1.39
Phosphorus	ug/L	50	-	-	-	-	455	509	157	164	112	195	105	106
Potassium	ug/L	100	-	-	-	-	14100	16500	17300	17900	11000	10700	13700	14100
Selenium	ug/L	0.5	2	-	-	10	<0.50	0.32	0.31	0.29	0.8	0.69	0.92	0.88
Silicon	ug/L	1000	-	-	-	-	6200	940	2600	3060	1710	5350	10700	11300
Silver	ug/L	0.05	1.5(Eq)	3(Eq)	-	-	<0.050	0.011	<0.010	0.02	<0.050	<0.010	<0.010	0.012
Sodium	ug/L	100	-	-	-	-	294000	279000	355000	403000	173000	165000	217000	240000
Strontium	ug/L	1	-	-	-	-	3410	3680	4050	3890	3030	2980	3400	3360
Sulfur	ug/L	300	-	-	-	-	177000	187000	216000	229000	66800	78800	108000	104000
Tellurium	ug/L	0.5	-	-	-	-	<0.250	<0.050	<0.050	<0.050	<0.250	<0.050	<0.050	<0.050
Thallium	ug/L	0.02	-	-	-	-	<0.0200	<0.0040	<0.0040	<0.0040	<0.0200	<0.0040	<0.0040	<0.0040
Thorium	ug/L	0.1	-	-	-	-	<0.050	0.013	0.028	0.03	<0.050	<0.010	<0.010	<0.010
Tin	ug/L	0.2	-	-	-	-	<0.250	<0.050	<0.050	<0.050	<0.250	<0.050	<0.050	<0.050
Titanium	ug/L	5	-	-	-	-	5.56	2.89	10.6	11.4	2.6	0.61	0.34	1.47
Tungsten	ug/L	1	-	-	-	-	<1.00	0.29	0.21	0.28	<1.00	<0.20	<0.20	<0.20
Uranium	ug/L	0.02	8.5	-	10	-	34	34.8	32.1	40.3	20.3	24.3	21.5	24.5
Vanadium	ug/L	5	-	-	100	-	3.73	2.77	2.6	2.92	4.28	2.35	2.06	2.93
Zinc	ug/L	4	327.75-1,312.5(Eq)	353.25-1,338(Eq)	5000(P)	-	<5.0	1.3	1.8	1.4	<5.0	1.3	<1.0	1.2
Zirconium	ug/L	0.1	-	-	-	-	0.724	0.684	0.259	0.484	0.142	0.151	0.094	0.126
Copper, dissolved	ug/L	0.5					<0.50	0.74	0.29	0.35	1.31	0.46	0.19	0.18
Inorganics														
Bromide	mg/L	0.1	-	-	-	-	0.31	<1.00	<0.10	<0.10	<0.10	<0.10	<1.00	<0.10
Chloride	mg/L	1	150	600	-	100	173	184	220	210	177	167	185	184
Fluoride	mg/L	0.1	-	1.99-2.5(Eq)	1	2	1.44	1.13	2	1.9	0.78	1	<1.00	1.17
Nitrate (as N)	mg/L	0.01	3	32.8	-	-	<0.010	<0.100	<0.010	0.02	<0.010	<0.010	<0.100	0.011
Nitrite (as N)	mg/L	0.01	0.2(Eq)	0.6(Eq)	-	-	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	0.1	0.019
Phosphate (as P)	mg/L	0.005	-	-	-	-	<0.0050	0.128	<0.0050	<0.0050	<0.0050	<0.0050	<0.0500	<0.0050
Sulfate	mg/L	10	429(Eq)	-	-	-	513	545	655	624	203	255	315	289
Hardness, Total (as CaCO3)	mg/L	0.125	-	-	-	-	977	942	1140	1250	650	626	707	759
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	10	-	907	944	1020	928	584	647	688	608
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	-	-	-	-	30.3	115	295	167	25.5	61.5	126	94.4
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	-	-	847	714	430	593	533	524	436	419
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	-	-	60.7	230	590	334	51	123	251	189
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia, Total (as N)	mg/L	0.05	0.102-0.453(P&T)	0.688-2.36(P&T)	-	-	<0.050	0.059	0.266	<0.050	<0.050	<0.050	0.163	<0.050
Carbon, Dissolved Organic	mg/L	0.5	-	-	-	-	11.1	26	19.4	18.2	6.03	7.72	10.8	8.44
Chemical Oxygen Demand	mg/L	20	-	-	-	-	126	50	65	46	25	31	37	40
Solids, Total Dissolved	mg/L	150	-	-	-	-	1740	1950	1840	1870	1030	1210	1270	1260
Nitrogen, Total Kjeldahl	mg/L	0.05	-	-	-	-	1.21	1.66	1.79	1.38	1.59	1.03	1.52	1.46
Phosphorus, Total (as P)	mg/L	0.005	-	0.005	-	-	0.36	0.512	0.179	0.123	0.121	0.2	0.118	0.102
Conductivity (EC)	uS/cm	2	-	-	-	-	2630	2660	2850	2890	1800	1870	2010	1980
Coliforms, Total (Q-Tray)	PN/100 ml	1	-	-	-	-	64	> 2420	> 24200	84	23	1050	816	1550
Coliforms, Fecal (Q-Tray)	PN/100 ml	1	-	-	-	-	2	12	17	14	8	37	53	48
Nitrate+Nitrite (as N)	mg/L	0.01					<0.0100	<0.100	<0.0100	0.0203	<0.0100	<0.0100	0.1	0.0299
Nitrogen, Total	mg/L	0.05					1.21	1.66	1.79	1.4	1.59	1.03	1.62	1.49
pH	pH units	0.1	-	6.5-9	-	5-9.5	8.43	8.72	9.42	8.97	8.51	8.69	8.98	8.79
Field conductivity	µS/cm	0.1	-	-	700	-	2640	2833	2915	2900	1784	1888	2044	1984

Notes:

1. Sample Location # provided for Figures 8A to 8I

Analytical Report: CARO 22c3134, 22c3349

BCWQG- BC Water Quality Guidelines (Approved or Working)

AW-Standards/Guidelines for the protection of Aquatic Ecosystem (Freshwater)

IW- Standards/Guidelines for the protection of Irrigation water

Bold	Exceeds BCWQG AW (LT) Guideline
<u>Underline</u>	Exceeds BCWQG AW (ST) Guideline
Shade	Exceeds BCWQG IW (LT) Guideline
Red text	Exceeds BCWQG IW (ST) Guideline

(Eq): Based on given equation

(P): pH dependent standard/guideline

(T): Temperature dependent standard/guideline

Table 4: Summary of Surface Water Analytical Results

DESCRIPTION			BC Water Quality Guidelines				Tutt Pond				Slough			
CLIENT ID	DATE SAMPLED	Tutt Pond					Tutt Pond	Tutt Pond	Tutt Pond	Slough	Slough	Slough	Slough	
MATRIX	Sampling Location # (Figures 8A to 8I)¹	Units RDL	AW-LT	AW-ST	IW-LT	IW-ST	2022-03-22	2022-06-21	2022-09-09	2022-10-19	2022-03-22	2022-06-21	2022-09-09	2022-10-19
							Water	Water	Water	Water	Water	Water	Water	Water
Total Metals							17	18	19	20	21	22	23	24
Aluminum	ug/L	5	50 (Eq)	100 (Eq)	-	5000	283	82.2	98.6	97.7	469	677	711	667
Antimony	ug/L	0.2	-	-	-	-	0.267	0.169	0.229	0.227	2.92	4.21	4.05	3.9
Arsenic	ug/L	0.5	-	5	-	100	2.45	2.78	4.38	4.78	23.1	33.2	47.5	40.5
Barium	ug/L	5	-	-	-	-	85.4	42.7	62.3	71.3	47	55.6	35.4	32.7
Beryllium	ug/L	0.1	-	-	100	-	<0.050	<0.010	<0.010	<0.020	<0.100	<0.050	<0.050	<0.050
Bismuth	ug/L	0.1	-	-	-	-	<0.050	<0.010	<0.010	<0.020	<0.100	<0.050	<0.050	0.056
Boron	ug/L	50	1200	-	500	-	30.5	36.1	41.4	43.9	225	373	536	577
Cadmium	ug/L	0.01	0.708 - 1.796 (Eq)	3.19 - 11.75 (Eq)	-	5.1	0.0148	<0.0060	0.0058	<0.0080	0.0365	<0.0150	0.0312	0.0234
Calcium	ug/L	200	-	-	-	-	85500	77200	84600	94600	38100	50600	18000	16200
Chromium	ug/L	0.5	-	-	4.9	-	0.92	0.32	0.41	0.45	1.99	1.72	2.45	2.01
Cobalt	ug/L	0.1	4	110	50	-	0.698	0.507	0.621	0.636	1.16	1.25	1.35	1.26
Copper	ug/L	0.4	6.43 -26 (Eq)	35.6-141 (Eq)	-	200	1.64	1.26	1.03	0.85	4.29	2.67	3.79	2.37
Iron	ug/L	10	-	350	-	-	434	93.1	135	151	623	836	998	918
Lead	ug/L	0.2	-	-	-	200	0.305	0.118	0.094	0.106	<0.500	0.6	0.686	0.545
Lithium	ug/L	0.1	-	-	750	-	27.5	24.7	30.5	28.6	40.5	54.4	75.8	73.1
Magnesium	ug/L	10	-	-	-	-	178000	164000	202000	250000	180000	205000	303000	399000
Manganese	ug/L	0.2	2,879.8-8,657 (Eq)	6,237.34-20,706.6 (Eq)	-	-	200	56.6	101	161	63.2	35.6	54.1	36
Mercury	ug/L	0.01	-	-	-	2	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	ug/L	0.1	7600	46000	10	50	10.2	12.1	14.5	13.3	18	16.1	24.5	30.7
Nickel	ug/L	0.4	150(Eq)	-	200	-	3.91	2.29	3.04	3.33	6.79	9.11	11.9	14
Phosphorus	ug/L	50	-	-	-	-	175	341	401	625	1170	1950	1170	1940
Potassium	ug/L	100	-	-	-	-	12100	13300	16600	16900	103000	138000	279000	306000
Selenium	ug/L	0.5	2	-	-	10	0.71	0.67	0.88	0.85	<1.00	0.76	0.6	0.78
Silicon	ug/L	1000	-	-	-	-	4370	2010	8600	8440	4970	4000	3570	3560
Silver	ug/L	0.05	1.5(Eq)	3(Eq)	-	-	<0.050	<0.010	<0.010	<0.020	<0.100	<0.050	<0.050	<0.050
Sodium	ug/L	100	-	-	-	-	307000	265000	365000	448000	996000	1050000	2010000	2780000
Strontium	ug/L	1	-	-	-	-	4520	4130	5340	5900	2090	2780	1610	1680
Sulfur	ug/L	300	-	-	-	-	226000	205000	297000	374000	445000	544000	959000	1260000
Tellurium	ug/L	0.5	-	-	-	-	<0.250	<0.050	<0.050	<0.100	<0.500	<0.250	<0.250	<0.250
Thallium	ug/L	0.02	-	-	-	-	<0.0200	<0.0040	<0.0040	<0.0080	<0.0400	<0.0200	<0.0200	<0.0200
Thorium	ug/L	0.1	-	-	-	-	<0.050	0.014	0.022	<0.020	<0.100	0.081	0.104	0.101
Tin	ug/L	0.2	-	-	-	-	<0.250	<0.050	<0.050	<0.100	0.518	0.304	0.382	0.374
Titanium	ug/L	5	-	-	-	-	18	5.63	5.46	5.27	25.3	32	38.5	32.4
Tungsten	ug/L	1	-	-	-	-	<1.00	<0.20	0.22	<0.40	<2.00	2.14	4.32	4.8
Uranium	ug/L	0.02	8.5	-	10	-	36.6	35.7	47.4	53.5	38	42.8	52.9	68.4
Vanadium	ug/L	5	-	-	100	-	5.47	3.73	5.07	5.04	10.3	11	8.22	8.84
Zinc	ug/L	4	327.75-1,312.5(Eq)	353.25-1,338(Eq)	5000(P)	-	<5.0	1.1	<1.0	<2.0	<10.0	5.5	6.6	6.5
Zirconium	ug/L	0.1	-	-	-	-	0.527	0.545	0.613	0.57	2.37	2.77	3.56	6.12
Copper, dissolved	ug/L	0.5					0.58	1.07	0.89	0.6	2.57	1.49	2	1.61
Inorganics														
Bromide	mg/L	0.1	-	-	-	-	<1.00	<1.00	<1.00	<1.00	1.29	<1.00	<1.00	3.38
Chloride	mg/L	1	150	600	-	100	219	218	284	268	397	487	880	1000
Fluoride	mg/L	0.1	-	1.99-2.5(Eq)	1	2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Nitrate (as N)	mg/L	0.01	3	32.8	-	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Nitrite (as N)	mg/L	0.01	0.2(Eq)	0.6(Eq)	-	-	<0.100	<0.100	<0.100	0.108	<0.100	0.11	<0.100	<0.100
Phosphate (as P)	mg/L	0.005	-	-	-	-	<0.0500	0.073	<0.100	0.059	0.199	0.92	0.244	0.19
Sulfate	mg/L	10	429(Eq)	-	-	-	656	605	886	997	1340	1640	3030	3530
Hardness, Total (as CaCO3)	mg/L	0.125	-	-	-	-	948	869	1050	1270	837	970	1290	1690
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	10	-	661	652	745	707	1170	1390	2240	2210
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	-	-	-	-	33.4	56.6	55	26.3	283	129	388	407
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	-	-	594	539	635	655	605	1130	1470	1400
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	-	-	66.8	113	110	52.5	566	259	775	814
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia, Total (as N)	mg/L	0.05	0.102-0.453(P&T)	0.688-2.36(P&T)	-	-	<0.050	<0.050	0.137	0.332	0.148	4.12	0.425	0.273
Carbon, Dissolved Organic	mg/L	0.5	-	-	-	-	10.3	11.5	15.7	15	54.5	66.3	138	125
Chemical Oxygen Demand	mg/L	20	-	-	-	-	28	46	42	47	258	196	463	417
Solids, Total Dissolved	mg/L	150	-	-	-	-	1870	1880	2380	2630	3760	4690	8110	8760
Nitrogen, Total Kjeldahl	mg/L	0.05	-	-	-	-	1.33	1.6	1.62	1.61	7.5	9.18	13.4	14.3
Phosphorus, Total (as P)	mg/L	0.005	-	0.005	-	-	0.199	0.305	0.453	0.541	1.35	2.05	1.34	1.73
Conductivity (EC)	uS/cm	2	-	-	-	-	2660	2500	3170	3380	5210	6020	10100	10900
Coliforms, Total (Q-Tray)	PN/100 ml	1	-	-	-	-	3	201	> 2420	3650	1030	> 2420	> 24200	1470
Coliforms, Fecal (Q-Tray)	PN/100 ml	1	-	-	-	-	2	8	140	326	80	344	> 2420	187
Nitrate+Nitrite (as N)	mg/L	0.01					<0.100	<0.100	<0.100	0.108	<0.100	0.11	<0.100	<0.100
Nitrogen, Total	mg/L	0.05					1.33	1.6	1.62	1.72	7.5	9.28	13.4	14.3
pH	pH units	0.1	-	6.5-9	-	5-9.5	8.5	8.62	8.56	8.42	9.28	8.66	9.17	9.16
Field conductivity	µS/cm	0.1	-	-	700	-	2695	2597	3305	3393	2695	6174	10445	11216

Notes:

1. Sample Location # provided for Figures 8A to 8I

Analytical Report: CARO 22c3134, 22c3349

BCWQG- BC Water Quality Guidelines (Approved or Working)

AW-Standards/Guidelines for the protection of Aquatic Ecosystem (Freshwater)

IW- Standards/Guidelines for the protection of Irrigation water

Bold	Exceeds BCWQG AW (LT) Guideline
<u>Underline</u>	Exceeds BCWQG AW (ST) Guideline
Shade	Exceeds BCWQG IW (LT) Guideline
Red text	Exceeds BCWQG IW (ST) Guideline

(Eq): Based on given equation

(P): pH dependent standard/guideline

(T): Temperature dependent standard/guideline

Table 4: Summary of Surface Water Analytical Results

DESCRIPTION CLIENT ID DATE SAMPLED MATRIX			BC Water Quality Guidelines				Little Robert Lake				Robert Lake			
							Little Robert Lake	Little Robert Lake	Little Robert Lake	Little Robert Lake	Robert Lake	Robert Lake	Robert Lake	Robert Lake
							2022-03-23	2022-06-21	2022-09-12	2022-10-19	2022-03-23	2022-06-21	2022-09-12	2022-10-19
Sampling Location # (Figures 8A to 8I) 'Units RDL			AW-LT	AW-ST	IW-LT	IW-ST	Water	Water	Water	Water	Water	Water	Water	Water
Total Metals							25	26	27	28	29	30	31	32
Aluminum	ug/L	5	50 (Eq)	100 (Eq)	-	5000	248	231	7270	268	277	449	242	848
Antimony	ug/L	0.2	-	-	-	-	0.416	0.409	0.714	0.537	<0.500	0.5	<0.500	<0.500
Arsenic	ug/L	0.5	-	5	-	100	4.32	4.8	8.98	6.57	7.3	8.61	11	12.1
Barium	ug/L	5	-	-	-	-	56.2	46.1	131	54.5	39.2	51.7	56	63
Beryllium	ug/L	0.1	-	-	100	-	0.011	<0.010	0.285	0.021	<0.100	<0.050	<0.100	<0.100
Bismuth	ug/L	0.1	-	-	-	-	0.012	<0.020	0.099	0.021	<0.100	<0.050	<0.100	<0.100
Boron	ug/L	50	1200	-	500	-	27.7	27.7	27.2	29.8	42.4	69.8	76.9	73.2
Cadmium	ug/L	0.01	0.708 - 1.796 (Eq)	3.19 - 11.75 (Eq)	-	5.1	0.0075	<0.0080	0.0808	0.0063	0.0319	<0.0350	<0.0300	0.0506
Calcium	ug/L	200	-	-	-	-	168000	149000	141000	143000	44400	59500	59400	43200
Chromium	ug/L	0.5	-	-	4.9	-	0.74	0.54	15.6	0.67	1.01	1.29	<1.00	1.85
Cobalt	ug/L	0.1	4	110	50	-	0.668	0.469	5.46	0.445	0.854	0.673	0.428	0.914
Copper	ug/L	0.4	6.43 -26 (Eq)	35.6-141 (Eq)	-	200	1.17	0.88	12.9	0.63	2.55	2.22	<2.00	2.85
Iron	ug/L	10	-	350	-	-	374	242	10300	292	399	450	260	1060
Lead	ug/L	0.2	-	-	-	200	0.231	0.238	4.08	0.166	<0.500	0.56	<0.500	0.991
Lithium	ug/L	0.1	-	-	750	-	35.8	33.6	62.5	47.8	15.6	19.7	24.1	24.2
Magnesium	ug/L	10	-	-	-	-	226000	216000	316000	357000	248000	285000	388000	417000
Manganese	ug/L	0.2	2,879.8-8,657 (Eq)	6,237.34-20,706.6 (Eq)	-	-	2080	305	306	336	213	119	64.4	103
Mercury	ug/L	0.01	-	-	-	2	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	ug/L	0.1	7600	46000	10	50	8.37	8.39	7.53	8.52	57.5	59.8	64.7	73.3
Nickel	ug/L	0.4	150(Eq)	-	200	-	2.1	1.84	14.9	1.78	4.44	4.89	4.17	6.12
Phosphorus	ug/L	50	-	-	-	-	1470	1610	1320	1780	2740	3140	3290	3890
Potassium	ug/L	100	-	-	-	-	21300	17400	29100	30300	44200	51300	68100	76600
Selenium	ug/L	0.5	2	-	-	10	0.39	0.32	0.4	0.32	<1.00	0.69	<1.00	<1.00
Silicon	ug/L	1000	-	-	-	-	6260	930	15600	2630	6600	5260	6610	8010
Silver	ug/L	0.05	1.5(Eq)	3(Eq)	-	-	<0.010	<0.020	0.041	<0.020	<0.100	<0.050	<0.100	<0.100
Sodium	ug/L	100	-	-	-	-	634000	615000	873000	996000	1900000	2100000	2780000	3320000
Strontium	ug/L	1	-	-	-	-	4310	4060	4990	5160	3200	3870	4810	5230
Sulfur	ug/L	300	-	-	-	-	717000	706000	961000	1000000	1360000	1530000	1930000	2110000
Tellurium	ug/L	0.5	-	-	-	-	<0.050	<0.100	<0.100	<0.100	<0.500	<0.250	<0.500	<0.500
Thallium	ug/L	0.02	-	-	-	-	<0.0044	<0.0080	0.0893	<0.0080	<0.0400	<0.0200	<0.0400	<0.0400
Thorium	ug/L	0.1	-	-	-	-	0.052	0.025	1.36	0.045	<0.100	0.079	<0.100	0.121
Tin	ug/L	0.2	-	-	-	-	<0.050	<0.100	0.205	<0.100	<0.500	<0.250	<0.500	<0.500
Titanium	ug/L	5	-	-	-	-	16.9	10	421	14.2	19	21.1	11.2	45.5
Tungsten	ug/L	1	-	-	-	-	<0.20	<0.40	<0.40	<0.40	<2.00	1.14	<2.00	<2.00
Uranium	ug/L	0.02	8.5	-	10	-	55.2	37	28.7	37.8	90.2	88.2	98.2	109
Vanadium	ug/L	5	-	-	100	-	3.22	2.29	19.9	2.93	9.23	<5.00	<10.0	<10.0
Zinc	ug/L	4	327.75-1,312.5(Eq)	353.25-1,338(Eq)	5000(P)	-	2.8	<2.0	27.2	<2.0	<10.0	<5.0	<10.0	<10.0
Zirconium	ug/L	0.1	-	-	-	-	0.622	0.284	3.95	0.475	2.35	2.45	1.54	2.41
Copper, dissolved	ug/L	0.5					0.4	0.34	0.24	0.22	3.32	1.83	<1.00	1.11
Inorganics														
Bromide	mg/L	0.1	-	-	-	-	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.33	1.48
Chloride	mg/L	1	150	600	-	100	82.2	90.3	120	119	188	253	326	350
Fluoride	mg/L	0.1	-	1.99-2.5(Eq)	1	2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Nitrate (as N)	mg/L	0.01	3	32.8	-	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Nitrite (as N)	mg/L	0.01	0.2(Eq)	0.6(Eq)	-	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Phosphate (as P)	mg/L	0.005	-	-	-	-	0.445	0.59	0.085	0.201	1.13	1.51	0.866	1.34
Sulfate	mg/L	10	429(Eq)	-	-	-	1810	2200	2930	2850	3540	4510	5050	6280
Hardness, Total (as CaCO3)	mg/L	0.125	-	-	-	-	1350	1260	1660	1830	1130	1320	1750	1820
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	10	-	656	701	719	703	1290	1560	1930	1790
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	-	-	-	-	67.5	104	135	74.6	227	245	305	306
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	-	-	521	493	448	554	840	1070	1320	1170
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	-	-	135	208	271	149	453	491	609	612
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia, Total (as N)	mg/L	0.05	0.102-0.453(P&T)	0.688-2.36(P&T)	-	-	0.054	<0.050	0.146	0.197	0.205	0.09	0.144	0.222
Carbon, Dissolved Organic	mg/L	0.5	-	-	-	-	15.6	17.8	23.8	23.1	38.4	47.6	61.6	65.5
Chemical Oxygen Demand	mg/L	20	-	-	-	-	68	61	98	80	198	168	199	247
Solids, Total Dissolved	mg/L	150	-	-	-	-	3190	3860	4520	4600	6680	8390	10700	11200
Nitrogen, Total Kjeldahl	mg/L	0.05	-	-	-	-	2.08	1.85	2.4	2.8	5.38	5.87	6.28	8.44
Phosphorus, Total (as P)	mg/L	0.005	-	0.005	-	-	1.54	1.67	1.45	1.68	2.9	3.22	3.47	3.68
Conductivity (EC)	uS/cm	2	-	-	-	-	4370	4460	5400	5480	8620	9830	11900	12300
Coliforms, Total (Q-Tray)	PN/100 mL	1	-	-	-	-	99	> 2420	11200	4290	609	> 2420	> 24200	23100
Coliforms, Fecal (Q-Tray)	PN/100 mL	1	-	-	-	-	<1	40	1050	41	1	1990	> 2420	1430
Nitrate+Nitrite (as N)	mg/L	0.01					<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Nitrogen, Total	mg/L	0.05					2.08	1.85	2.4	2.8	5.38	5.87	6.28	8.44
pH	pH units	0.1	-	6.5-9	-	5-9.5	8.65	8.82	8.94	8.63	9	8.95	9.05	9.06
Field conductivity	µS/cm	0.1	-	-	700	-	4227	4580	5528	5482	8300	9829	12400	12671

Notes:

1. Sample Location # provided for Figures 8A to 8I

Analytical Report: CARO 22c3134, 22c3349

BCWQG- BC Water Quality Guidelines (Approved or Working)

AW-Standards/Guidelines for the protection of Aquatic Ecosystem (Freshwater)

IW- Standards/Guidelines for the protection of Irrigation water

Bold	Exceeds BCWQG AW (LT) Guideline
<u>Underline</u>	Exceeds BCWQG AW (ST) Guideline
Shade	Exceeds BCWQG IW (LT) Guideline
Red text	Exceeds BCWQG IW (ST) Guideline

(Eq): Based on given equation

(P): pH dependent standard/guideline

(T): Temperature dependent standard/guideline

Table 5: Summary of Leachate Water Analytical Results

DESCRIPTION			S Leachate Wet Well				P1 Leachate MH-2			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SAMPLE ID			S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well	P1 Leachate MH - 2	P1 Leachate MH-2	P1 Leachate MH-2	P1 Leachate MH-2
SAMPLE DATE			2022-02-04	2022-06-23	2022-09-20	2022-10-20	2022-02-04	2022-06-23	2022-09-20	2022-10-20
MATRIX			Water	Water	Water	Water	Water	Water	Water	Water
Analyte	Units	RL	Analytical Results							
Inorganics										
Bromide	mg/L	1	<1.00	2.18	2.24	2.67	<1.00	<1.00	<1.00	<1.00
Chloride	mg/L	10	789	654	859	805	1030	719	2050	1630
Fluoride	mg/L	1	<1.00	<1.00	<1.00	<1.00	<1.00	1	<1.00	<1.00
Nitrate (as N)	mg/L	0.1	<0.100	<0.100	<0.100	0.142	<0.100	<0.100	<0.100	<0.100
Nitrite (as N)	mg/L	0.1	<0.100	<0.100	8.19	<0.100	<0.100	<0.100	<0.100	<0.100
Phosphate (as P)	mg/L	0.05	3.62	0.664	2.87	1.49	0.221	2.3	6.57	3.78
Sulfate	mg/L	10	1880	1620	1820	1770	369	451	<10.0	382
Hardness, Total (as CaCO3)	mg/L	12.5	1070	938	995	1250	2510	1490	2500	2090
Alkalinity, Total (as CaCO3)	mg/L	1	5560	4110	6400	6170	6530	4330	10900	8340
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	<1.0	69.1	529	290	<1.0	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	5560	3980	5340	5590	6530	4330	10900	8340
Alkalinity, Carbonate (as CaCO3)	mg/L	1	<1.0	138	1060	580	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia, Total (as N)	mg/L	1.25	50.6	38.9	69.3	65.7	522	465	1320	1010
BOD, 5-day	mg/L	119	291	161	295	313	642	406	421	212
Carbon, Dissolved Organic	mg/L	25	88.8	105	153	127	381	140	994	615
Chemical Oxygen Demand	mg/L	20	752	658	844	887	2130	5700	2320	1900
Phosphorus, Total (as P)	mg/L	0.1	6.15	4.75	6	6.74	10.6	19.8	14.6	10.3
Solids, Total Dissolved	mg/L	150	10100	7390	10500	10800	7480	4670	10300	8730
Sulfide, Total	mg/L	2	156	61.6	179	139	43.3	18.3	1.62	27.1
pH	pH units	0.1	8.59	8.35	8.55	8.41	7.27	7.67	7.7	7.72
Metals										
Mercury, dissolved	mg/L	0.00002	<0.000020	<0.000040	<0.000010	<0.000010	<0.000020	<0.000040	<0.000010	<0.000010
Aluminum, dissolved	ug/L	100	359	90.7	100	113	352	112	233	225
Antimony, dissolved	ug/L	5	31.5	12.3	30.8	41.4	13.5	6.4	21.1	25.8
Arsenic, dissolved	ug/L	5	74	31.3	65.2	97.2	27.7	17.9	29.8	39
Barium, dissolved	ug/L	10	108	95.6	112	144	213	193	202	276
Beryllium, dissolved	ug/L	1	<1.00	<0.050	<0.100	<0.100	<1.00	<0.050	<0.100	<0.100
Bismuth, dissolved	ug/L	1	<1.00	<0.050	<0.100	<0.100	<1.00	<0.050	<0.100	<0.100
Boron, dissolved	ug/L	200	1990	1610	1770	1950	7000	3310	14800	11600
Cadmium, dissolved	ug/L	0.2	<0.200	<0.0100	<0.0200	<0.0200	<0.200	0.012	0.0343	0.0256
Calcium, dissolved	ug/L	5000	69100	48100	71600	85900	396000	146000	290000	204000
Chromium, dissolved	ug/L	10	15.3	16.2	32.7	39.7	83.2	68.6	211	180
Cobalt, dissolved	ug/L	0.5	3.45	2.78	3.9	6.01	14.1	13	45.7	30.9
Copper, dissolved	ug/L	10	<10.0	0.74	<1.00	<1.00	<10.0	0.78	1.65	<1.00
Iron, dissolved	ug/L	200	<200	26.7	23.7	69.2	499	2720	4640	565
Lead, dissolved	ug/L	5	<5.00	<0.250	<0.500	<0.500	<5.00	<0.250	<0.500	<0.500
Lithium, dissolved	ug/L	5	76.9	61	62.7	73.9	185	104	290	252
Magnesium, dissolved	ug/L	500	217000	199000	198000	252000	369000	273000	430000	383000
Manganese, dissolved	ug/L	5	128	197	104	275	4540	1530	1740	1260
Molybdenum, dissolved	ug/L	1	4.73	2.28	2.97	7.98	2.69	6.95	6.43	6.25
Nickel, dissolved	ug/L	4	17.9	14.4	18.8	26.1	131	87.7	339	249
Phosphorus, dissolved	ug/L	1000	6890	4920	5940	7090	10800	6470	10000	10200
Potassium, dissolved	ug/L	2000	180000	195000	192000	269000	406000	340000	893000	853000
Selenium, dissolved	ug/L	10	40.5	54	<1.00	1.26	31.6	9.09	6.85	4.93
Silicon, dissolved	ug/L	10000	12100	10800	10200	13300	19800	17600	20200	19700
Silver, dissolved	ug/L	1	<1.00	<0.050	<0.100	<0.100	<1.00	<0.050	<0.100	<0.100
Sodium, dissolved	ug/L	2000	2900000	2080000	2630000	3840000	1290000	820000	1660000	2210000
Strontium, dissolved	ug/L	10	2020	2010	2140	2900	4410	4000	3420	3650
Sulfur, dissolved	ug/L	100000	723000	889000	566000	788000	150000	179000	28900	197000
Tellurium, dissolved	ug/L	5	<5.00	1.13	<0.500	<0.500	<5.00	0.279	<0.500	<0.500
Thallium, dissolved	ug/L	0.4	0.451	<0.0200	<0.0400	<0.0400	1.53	<0.0200	<0.0400	<0.0400
Thorium, dissolved	ug/L	1	<1.00	<0.050	<0.100	<0.100	<1.00	<0.050	0.109	0.162
Tin, dissolved	ug/L	5	93.7	37.3	93.7	129	11.7	5.47	21.1	30.3
Titanium, dissolved	ug/L	20	71.1	30.5	53.6	75.8	83.1	52.4	165	145
Tungsten, dissolved	ug/L	20	<20.0	2.86	4.18	5.34	<20.0	1.6	7.06	5.26
Uranium, dissolved	ug/L	0.1	28.5	17.4	10.5	18.5	6.8	25.7	1.75	10.4
Vanadium, dissolved	ug/L	20	<20.0	10.5	11.1	14.5	20.6	28.5	86.5	76
Zinc, dissolved	ug/L	100	<100	<5.0	<10.0	<10.0	<100	12.5	23	<10.0
Zirconium, dissolved	ug/L	2	20.3	17.4	31.7	43.1	19.5	18.9	61.9	60
Polycyclic Aromatic Hydrocarbons (PAH)										
Acenaphthene	ug/L	0.504	<0.583	0.403	<0.500	0.356	<0.504	0.879	<0.050	0.106
Acenaphthylene	ug/L	2.01	<2.33	<0.200	<2.00	<0.200	<2.01	<0.200	<0.200	<0.200
Acridine	ug/L	0.504	<0.583	<0.050	<0.500	<0.050	<0.504	0.471	0.159	<0.050
Anthracene	ug/L	0.101	<0.117	<0.010	<0.100	<0.010	<0.101	<0.029	<0.010	<0.010
Benz(a)anthracene	ug/L	0.101	<0.117	<0.010	<0.100	<0.010	<0.101	<0.010	<0.010	<0.010
Benzo(a)pyrene	ug/L	0.101	<0.117	<0.010	<0.100	<0.010	<0.101	<0.010	<0.010	<0.010
Benzo(b+h)fluoranthene	ug/L	0.504	<0.583	<0.050	<0.500	<0.050	<0.504	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	ug/L	0.504	<0.583	<0.050	<0.500	<0.050	<0.504	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	ug/L	0.504	<0.583	<0.050	<0.500	<0.050	<0.504	<0.050	<0.050	<0.050
2-Chloronaphthalene	ug/L	1.01	<1.17	<0.100	<1.00	<0.100	<1.01	<0.100	<0.100	<0.100
Chrysene	ug/L	0.504	<0.583	<0.050	<0.500	<0.050	<0.504	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	ug/L	0.101	<0.117	<0.010	<0.100	<0.010	<0.101	<0.010	<0.010	<0.010
Fluoranthene	ug/L	0.302	<0.350	0.062	<0.300	<0.030	<0.302	<0.030	<0.030	<0.030
Fluorene	ug/L	0.504	<0.583	0.309	<0.500	0.243	<0.504			

Table 5: Summary of Leachate Water Analytical Results

DESCRIPTION			N Pumphouse MH				P2 A2 Leachate MH			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SAMPLE ID			N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	P2 A2 Leachate MH	P2 A2 Leachate MH	P2 A2 Leachate MH	P2 A2 Leachate MH
SAMPLE DATE			2022-02-04	2022-06-23	2022-09-14	2022-10-20	2022-02-07	2022-06-23	2022-09-14	2022-10-20
MATRIX			Water	Water	Water	Water	Water	Water	Water	Water
Analyte		Units	RL	Analytical Results						
Inorganics										
Bromide	mg/L	1	<1.00	1.1	3.67	1.75	1.51	<1.00	4.4	3.2
Chloride	mg/L	10	779	540	792	439	934	1480	1480	1420
Fluoride	mg/L	1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Nitrate (as N)	mg/L	0.1	<0.100	<0.100	<0.100	<0.100	7.7	<0.100	<0.100	1.57
Nitrite (as N)	mg/L	0.1	<0.100	<0.100	<0.100	<0.100	0.29	<0.100	<0.100	<0.100
Phosphate (as P)	mg/L	0.05	3.57	0.387	0.463	0.189	<0.0500	<0.0500	<0.0500	<0.0500
Sulfate	mg/L	10	1850	1330	1660	754	410	66	<100	104
Hardness, Total (as CaCO3)	mg/L	12.5	1050	1270	1090	952	2100	2260	2150	2230
Alkalinity, Total (as CaCO3)	mg/L	1	5240	3470	5740	2290	2450	4550	4520	4000
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	<1.0	<1.0	330	35.2	<1.0	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	5240	3470	5080	2220	2450	4550	4520	4000
Alkalinity, Carbonate (as CaCO3)	mg/L	1	<1.0	<1.0	660	70.4	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia, Total (as N)	mg/L	1.25	40.8	44.2	52.9	23.3	69.8	210	212	211
BOD, 5-day	mg/L	119	325	> 400	182	67.7	2520	107	37	128
Carbon, Dissolved Organic	mg/L	25	110	112	152	76.1	112	535	186	224
Chemical Oxygen Demand	mg/L	20	700	1680	667	240	4100	822	787	662
Phosphorus, Total (as P)	mg/L	0.1	5.6	5.18	5.44	2.27	85.8	2.42	1.64	1.13
Solids, Total Dissolved	mg/L	150	8990	6250	9140	4310	4200	6200	5980	5870
Sulfide, Total	mg/L	2	79.1	49.5	77.4	32.5	29.8	0.108	0.026	0.02
pH	pH units	0.1	8.47	8.1	8.45	8.37	7.9	7.73	7.67	7.76
Metals										
Mercury, dissolved	mg/L	0.00002	<0.000020	<0.000040	<0.000040	<0.000010	<0.000020	<0.000040	<0.000010	<0.000010
Aluminum, dissolved	ug/L	100	341	72.2	95.3	53.7	264	24.4	20.2	19.5
Antimony, dissolved	ug/L	5	26.8	10.1	26.7	16.6	<5.00	1.96	2.02	2.06
Arsenic, dissolved	ug/L	5	65.4	24.8	59.9	36.1	73.7	116	34.2	33
Barium, dissolved	ug/L	10	97.1	156	130	128	2060	1930	1340	1490
Beryllium, dissolved	ug/L	1	<1.00	<0.050	<0.100	<0.050	<1.00	<0.050	<0.050	<0.050
Bismuth, dissolved	ug/L	1	<1.00	<0.050	<0.100	<0.050	<1.00	<0.050	<0.050	<0.050
Boron, dissolved	ug/L	200	1820	1650	1850	947	3870	5680	6170	5770
Cadmium, dissolved	ug/L	0.2	<0.200	<0.0100	<0.0200	<0.0100	<0.200	0.0108	0.02	0.0133
Calcium, dissolved	ug/L	5000	68400	81200	73800	71500	146000	145000	134000	144000
Chromium, dissolved	ug/L	10	18.1	14.1	29.2	14.5	17.1	21.2	18.6	17.5
Cobalt, dissolved	ug/L	0.5	3.19	4.64	4.74	2.32	40.8	14.6	13.9	15.1
Copper, dissolved	ug/L	10	<10.0	<0.50	<1.00	<0.50	<10.0	1.19	1.83	1.92
Iron, dissolved	ug/L	200	<200	28	32.8	28.8	13600	16000	2240	1870
Lead, dissolved	ug/L	5	<5.00	<0.250	<0.500	<0.250	<5.00	<0.250	<0.250	<0.250
Lithium, dissolved	ug/L	5	71.3	63.2	60.2	55.6	42.3	33.6	31.9	34.9
Magnesium, dissolved	ug/L	500	213000	259000	220000	188000	422000	461000	441000	454000
Manganese, dissolved	ug/L	5	120	311	130	106	369	107	135	140
Molybdenum, dissolved	ug/L	1	5.72	2.96	6.48	11.4	31.2	8.06	5.5	7.01
Nickel, dissolved	ug/L	4	17.1	16.3	21.7	10.7	201	182	192	198
Phosphorus, dissolved	ug/L	1000	5000	4040	5570	2570	1480	1440	459	457
Potassium, dissolved	ug/L	2000	167000	167000	211000	105000	221000	209000	208000	233000
Selenium, dissolved	ug/L	10	34.4	1.91	<1.00	2.4	<10.0	3.74	2.01	2.17
Silicon, dissolved	ug/L	10000	11700	12600	11100	11200	21400	33500	27900	27400
Silver, dissolved	ug/L	1	<1.00	<0.050	<0.100	<0.050	<1.00	<0.050	<0.050	<0.050
Sodium, dissolved	ug/L	2000	2700000	1770000	2810000	1490000	1120000	1300000	1430000	1450000
Strontium, dissolved	ug/L	10	2060	3220	2550	3280	6430	8490	8000	9110
Sulfur, dissolved	ug/L	100000	622000	490000	611000	357000	170000	38900	45500	44800
Tellurium, dissolved	ug/L	5	<5.00	<0.250	<0.500	<0.250	<5.00	<0.250	<0.250	<0.250
Thallium, dissolved	ug/L	0.4	4.61	<0.0200	<0.0400	<0.0200	<0.400	<0.0200	<0.0200	<0.0200
Thorium, dissolved	ug/L	1	<1.00	<0.050	<0.100	<0.050	<1.00	<0.050	<0.050	<0.050
Tin, dissolved	ug/L	5	44.2	7.79	42.4	27.4	<5.00	2.44	2.13	2.32
Titanium, dissolved	ug/L	20	53.5	31.1	62.6	27.9	<20.0	25.5	17.3	16.4
Tungsten, dissolved	ug/L	20	<20.0	2.42	4.31	1.93	<20.0	4.58	3.8	3.83
Uranium, dissolved	ug/L	0.1	28.3	16.9	15.5	32.2	22.5	2.84	1.98	3.03
Vanadium, dissolved	ug/L	20	<20.0	9.55	12.2	7.13	<20.0	57.8	28.2	24.8
Zinc, dissolved	ug/L	100	<100	<5.0	<10.0	<5.0	<100	<5.0	<5.0	<5.0
Zirconium, dissolved	ug/L	2	18.9	18.3	28.2	16.1	86.9	94.4	102	102
Polycyclic Aromatic Hydrocarbons (PAH)										
Acenaphthene	ug/L	0.504	<0.514	1.59	0.275	0.062	7840	<0.050	<0.050	<0.050
Acenaphthylene	ug/L	2.01	<2.06	<0.200	<0.200	<0.200	0.193	<0.200	<0.200	<0.200
Acridine	ug/L	0.504	<0.514	0.283	<0.050	<0.050	<0.200	<0.050	<0.050	<0.050
Anthracene	ug/L	0.101	<0.103	<0.414	<0.010	<0.010	0.414	<0.010	<0.010	<0.010
Benz(a)anthracene	ug/L	0.101	<0.103	0.163	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)pyrene	ug/L	0.101	<0.103	0.017	<0.010	<0.010	<0.071	<0.010	<0.010	<0.010
Benzo(b,h,i)fluoranthene	ug/L	0.504	<0.514	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	ug/L	0.504	<0.514	<0.050	<0.050	<0.050	<0.398	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	ug/L	0.504	<0.514	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-Chloronaphthalene	ug/L	1.01	<1.03	<0.100	<0.100	<0.100	<0.055	<0.100	<0.100	<0.100
Chrysene	ug/L	0.504	<0.514	0.177	<0.050	<0.050	<0.100	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	ug/L	0.101	<0.103	<0.010	<0.010	<0.010	<0.241	<0.010	<0.010	<0.010
Fluoranthene	ug/L	0.302	<0.309	0.422	<0.030	<0.030	<0.010	<0.030	<0.030	<0.030
Fluorene	ug/L	0.504	<0.514	1.2	0					

APPENDIX A

LEACHATE MANAGEMENT SYSTEM

APPENDIX A – LEACHATE MANAGEMENT SYSTEM

A leachate management plan (LMP) is implemented to provide short-term and long-term solutions for leachate collection, storage, treatment, and disposal at the Site. The objectives of the leachate management plan are to provide methods for Landfill leachate collection, treatment, and disposal; estimate leachate generation rates; forecast leachate quality; and identify the discharge requirements that are protective of groundwater, surface water, and the receiving environment. The LMP is summarized in the subsections below. The existing Landfill footprint includes Phase 1, Phase 2 and Phase 3 areas. These areas are constructed with a natural control liner system that includes greater than 2 metres of in-situ native clay with a hydraulic conductivity of between 10^{-6} and 10^{-9} cm/s. The cell located at the far north end of Phase 1 (referred to as the Northern Expansion) is equipped with an engineered geomembrane liner. Vertical groundwater flow throughout the Site is generally noted to be upwards provided the leachate level is maintained at an elevation at or below 437 m above mean sea level (AMSL).

Leachate collection within the existing landfilled areas of Phase 1 and Phase 2 consists of gravity drains that convey leachate via a leachate forcemain located along the west side of the Landfill for eventual discharge to the municipal sanitary sewer system. Three lift stations facilitate the movement of leachate across the Site: Lift Station #1 (LS#1), located in the northwest portion of the Site, Lift Station #2 (LS#2), located in the southwest corner of Phase 2, and combined sewer and leachate Lift Station #3 (LS#3), located at the leachate pre-treatment system in the northwest portion of the Site. LS#3 (or McKinley Lift Station) was constructed in 2016 as part of property development in the residential areas northwest of the Landfill and construction of an upgraded sewer line in the Glenmore Road corridor next to the Site. LS#2 pumps leachate collected from Phase 2 into a gravity system that feeds into LS#1 and LS#3.

Collected leachate is pre-treated with Bioxide at LS#3 to address potential elevated hydrogen sulfide levels. The combined sewage and leachate is also aerated and treated for odours by a Biorem Multi-Stage Biofilter. The effluent is discharged into the municipal sanitary sewer system at Glenmore Road North and is ultimately treated at the City's wastewater treatment plant. The leachate management system also includes an emergency back-up leachate discharge forcemain to the Quail Ridge subdivision, however; as of November 2016, leachate is no longer regularly discharged to the sewer force main to the Quail Ridge system.

Leachate collection within the existing areas of Phase 1 and Phase 2 consists of the following components:

- A 0.3 m thick leachate collection system and perforated collection piping within the lined Northern Expansion area.
- A perforated leachate collection pipe oriented east-west across the central portion of Phase 1 and Phase 2 that drains to the west.
- A perforated leachate collection pipe oriented east-west installed on the Phase 2 and Phase 3 boundary that drains to the western leachate lift station (LS#2).
- Non-perforated leachate forcemain to convey collected leachate to appropriate lift stations and/or leachate manholes.

APPENDIX B

HISTORICAL SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER, SURFACE WATER AND LEACHATE

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics													
			pH	Total Hardness mg/L	pH (field)	Conductivity μS/cm	Field Conductivity μS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Ammonia, Total (as N) μg/L	Nitrate (as N) μg/L	Nitrite (as N) μg/L	Chloride mg/L	Fluoride μg/L	Sulfate mg/L	Total Alkalinity mg/L	Alkalinity, Bicarbonate (as CaCO3) mg/L	Alkalinity, Carbonate (as CaCO3) mg/L	Alkalinity, Hydroxide (as CaCO3) mg/L	Alkalinity, Phenolphthalein (as CaCO3) mg/L	Bromide mg/L	Hydrogen Sulfide mg/L	Sulfide mg/L	Chemical Oxygen Demand mg/L	Dissolved Phosphate mg/L	Ortho-Phosphate mg/L			
09BH03	09BH03-20151105	2015 11 05	7.65	661	-	-	-	2,040	-	-	< 5.0	1,330	-	20	1,580	990	736	736	< 1.0	< 1.0	-	< 1.0	-	-	-	< 20	-	0.0079		
	09BH03-20170601	2017 06 01	8.13	940	-	-	-	2,270	-	-	39.8	690	-	15	1,030	1,240	698	-	-	-	< 1.0	-	-	-	< 20	-	0.0087			
	09BH03-180604	2018 06 04	7.53	1,130	6.87	-	3,665	2,800	7.39	0.0075	< 20	< 10	< 10	26.2	790	1,500	788	788	< 1.0	< 1.0	< 1.0	< 0.10	-	-	30	0.0075	-			
	09BH03-190530	2019 05 30	7.80	929	6.81	-	3120	2,460	5.85	0.0090	274	1,880	< 10	27.9	1,510	1,090	780	780	< 1.0	< 1.0	< 1.0	< 0.10	-	-	26	0.0090	-			
	09BH03-200609	2020 06 09	7.80	1,270	7.04	-	3,178	3,020	7.88	-	< 50	1,750	< 10	25.3	950	1,540	776	776	< 1.0	< 1.0	< 1.0	< 0.10	-	-	22	-	< 0.0050			
	09BH03-210609	2021 06 09	7.94	812	7.08	-	2,869	1,800	7.73	-	120	1,010	< 100	11.1	< 1,000	939	713	713	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0500			
09BH04	09BH04-20151105	2015 11 05	7.19	1,120	-	-	-	2,730	-	-	346	< 100	-	31	1,350	1,130	1,400	1,400	< 1.0	< 1.0	-	< 1.0	-	-	22	-	0.0012			
09BH06-S	09BH06-S-20131112	2013 11 12	-	353	-	-	-	700	-	-	87	< 50	-	8.3	940	230	392	-	-	-	-	-	-	-	< 20	-	-			
	09BH06-S-20140602	2014 06 02	-	358	-	-	-	700	-	-	91	< 50	-	10.9	1,010	244	379	-	-	-	-	< 0.50	-	-	< 20	-	0.0199			
	09BH06-S-20141117	2014 11 17	-	354	-	-	-	713	-	-	94	< 50	-	8	1,010	256	399	-	-	-	-	< 0.50	-	-	< 20	-	0.0177			
	09BH06-S-20150610	2015 06 10	8.22	351	-	-	-	716	-	-	95.1	< 25	-	7.1	960	252	394	-	-	-	-	< 0.25	-	-	< 20	-	0.0205			
	09BH06-S-20151105	2015 11 05	7.91	349	-	-	-	724	-	-	101	< 25	-	7.6	980	282	362	362	< 1.0	< 1.0	-	< 0.25	-	-	< 20	-	0.0157			
	09BH06-D	09BH06-D-20131112	2013 11 12	-	372	-	-	-	706	-	-	94	< 50	-	9.1	940	243	397	-	-	-	-	-	-	-	< 20	-	-		
09BH06-D	DUP4-20131112	Duplicate	-	369	-	-	-	715	-	-	92	< 50	-	9	950	244	383	-	-	-	-	-	-	-	-	< 20	-	-		
	QA/QC RPD%		-	1	-	-	-	1	-	-	2	*	-	1	1	0	4	-	-	-	-	-	-	-	*	-	-			
	09BH06-D-20140602	2014 06 02	-	366	-	-	-	720	-	-	96	< 50	-	9.5	1,000	254	376	-	-	-	-	< 0.50	-	-	< 20	-	0.0125			
	09BH06-D-20141117	2014 11 17	-	372	-	-	-	743	-	-	99.5	< 50	-	8.3	1,010	272	407	-	-	-	-	< 0.50	-	-	42	-	0.009			
	09BH06-D-20150610	2015 06 10	8.21	385	-	-	-	770	-	-	102	< 25	-	7.9	940	285	398	-	-	-	-	< 0.25	-	-	< 20	-	0.0107			
	09BH06-D-20151105	2015 11 05	7.93	369	-	-	-	760	-	-	100	< 25	-	7.7	940	295	365	365	< 1.0	< 1.0	-	< 0.25	-	-	< 20	-	0.008			
	09BH06-D-20170606	2017 06 06	8.42	364	-	-	-	699	-	-	107	< 25	-	8.2	970	286	343	-	-	-	-	< 0.25	-	-	< 20	-	0.0092			
	09BH06-D-180604	2018 06 04	7.76	387	6.99	-	1,289	800	2.98	0.0055	167	< 10	< 10	7.16	450	282	355	355	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	0.0055	-			
	09BH06-D-190528	2019 05 28	8.04	435	7.08	-	1,229	968	2.88	0.0073	199	< 10	< 10	9.45	800	392	377	377	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	0.0073	-			
	09BH06-D-200609	2020 06 09	7.95	422	7.3	-	1,038	849	2.26	-	96	< 10	< 10	8.22	790	327	373	373	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	< 0.0050			
	09BH06-D-210608	2021 06 08	8.08	333	7.40	-	1,142	742	2.54	-	120	< 10	< 10	6.95	960	278	357	357	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	< 0.0050			
	GL0-1	GL0-1-20130625	2013 06 25	-	427	-	-	-	771	-	-	91.9	< 50	-	7.9	1,170	373	205	-	-	-	-	< 0.50	-	-	< 20	-	-		
	GL0-1-20140603	2014 06 03	-	416	-	-	-	711	-	-	52.9	99	-	9.1	1,010	348	205	-	-	-	-	< 0.50	-	-	< 20	-	0.0596			
	GL0-1-20141124	2014 11 24	-	436	-	-	-	711	-	-	58.4	< 50	-	9.3	970	355	209	-	-	-	-	< 0.50	-	-	< 20	-	0.0519			
	DUP1-20141124	Duplicate	-	430	-	-	-	680	-	-	62.1	< 50	-	7.9	1,140	355	205	-	-	-	-	< 0.50	-	-	< 20	-	0.0518			
	QA/QC RPD%		-	1	-	-	-	4	-	-	6	*	-	16	16	0	2	-	-	-	-	*	-	-	*	-	0			
GL0-1-20150608	2015 06 08	7.59	423	-	-	-	665	-	-	48.9	116	-	7.3	884	345	209	-	-	-	-	< 0.10	-	-	< 20	-	0.0637				
GL0-1-20151103	2015 11 03	7.65	423	-	-	-	682	-	-	77.4	< 25	-	7.1	990	354	206	-	-	-	-	< 0.25	-	-	< 20	-	0.0617				
GL0-1-20160524	2016 05 24	8.19	423	-	-	-	673	-	-	38.4	65	-	7.1	980	346	198	198	< 1.0	< 1.0	-	< 0.25	-	-	< 20	-	0.0555				
GL0-1-20170524	2017 05 24	8.32	418	-	-	-	671	-	-	9.7	131	-	7.2	1,000	350	196	-	-	-	-	< 0.25	-	-	< 20	-	0.0614				
GL0-1-180529	2018 05 29	7.81	415	7.65	-	934	690	0.87	0.0516	43	82	< 10	6.47	640	281	187	187	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	0.0516	-				
GL0-1-190523	2019 05 23	8.09	384	7.65	-	859	691	1.69	0.0174	< 20	109	< 10	6.33	730	326	191	191	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	0.0174	-				
GL0-1-200310	2020 03 10	7.94	405	-	-	-	705	1.01	-	284	49	< 10	6.82	860	316	189	189	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	0.0175				

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate			
GL0-2	GL0-2-20130627	2013 06 27	-	506	-	-	-	956	-	-	183	6,410	-	49.4	1,410	395	294	-	-	-	-	< 0.50	-	-	< 20	-	-			
	GL0-2-20140603	2014 06 03	-	465	-	-	-	744	-	-	101	181	-	20.9	1,240	326	255	-	-	-	-	< 0.50	-	-	< 20	-	0.0591			
	GL0-2-20141124	2014 11 24	-	496	-	-	-	814	-	-	92.6	1,820	-	26.3	1,220	341	268	-	-	-	-	< 0.50	-	-	< 20	-	0.0553			
	GL0-2-20150608	2015 06 08	7.8	479	-	-	-	675	-	-	213	< 10	-	9.6	1,090	317	273	-	-	-	-	< 0.10	-	-	< 20	-	0.0399			
	GL0-2-20151103	2015 11 03	7.94	500	-	-	-	726	-	-	171	< 25	-	12.1	1,190	317	268	-	-	-	-	< 0.25	-	-	< 20	-	0.0446			
	DUP1-20151103	Duplicate	7.94	510	-	-	-	774	-	-	167	49	-	13.1	1,220	326	255	-	-	-	-	< 0.25	-	-	< 20	-	0.0446			
	QA/QC RPD%		0	2	-	-	-	6	-	-	2	*	-	8	2	3	5	-	-	-	-	*	-	-	*	-	0			
	GL0-2-20160524	2016 05 24	8.22	468	-	-	-	700	-	-	208	< 25	-	6.8	1,240	310	266	266	< 1.0	< 1.0	-	< 0.25	-	-	< 20	-	0.0423			
	GL0-2-20170524	2017 05 24	8.4	482	-	-	-	696	-	-	173	< 25	-	7.1	1,320	325	258	-	-	-	-	< 0.25	-	-	< 20	-	0.0463			
	GL0-2-180529	2018 05 29	7.82	473	7.43	-	-	931	726	1.12	0.0173	211	< 10	< 10	9.63	1,050	296	258	258	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	0.0173	-		
	DUP2-180529	Duplicate	7.85	469	7.43	-	-	931	698	1.17	0.0093	214	< 10	< 10	9.45	1,100	294	260	260	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	0.0093	-		
	QA/QC RPD%		0	1	*	-	-	4	*	*	1	*	*	2	5	1	1	1	*	*	*	*	*	-	-	*	*	-		
	GL0-2-190529	2019 05 29	8.01	546	7.5	-	-	1406	1,050	3.70	< 0.0050	173	16,800	47	71.6	1,050	349	340	340	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	< 0.0050	-		
	GL0-2-200310	2020 03 10	7.95	456	-	-	-	721	1.18	-	-	317	< 10	< 10	7.88	1,150	303	255	255	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	0.0134		
GL0-3	GL0-3-20130627	2013 06 27	-	762	-	-	-	1,500	-	-	< 5.0	49,500	-	123	1,580	400	436	-	-	-	-	< 1.0	-	-	27	-	-			
	GL0-3-20140603	2014 06 03	-	747	-	-	-	1,440	-	-	< 5.0	48,600	-	124	1,190	385	445	-	-	-	-	< 1.0	-	-	20	-	0.0096			
	GL0-3-20141124	2014 11 24	-	797	-	-	-	1,440	-	-	11.8	49,300	-	127	1,160	390	457	-	-	-	-	< 1.0	-	-	< 20	-	0.0059			
	GL0-3-20150608	2015 06 08	7.65	772	-	-	-	1,390	-	-	13	47,700	-	121	1,120	391	456	-	-	-	-	< 0.50	-	-	48	-	0.0069			
	GL0-3-20151103	2015 11 03	7.53	751	-	-	-	1,460	-	-	7.5	47,600	-	121	1,130	382	422	-	-	-	-	< 0.50	-	-	< 20	-	0.0068			
	GL0-3-20160524	2016 05 24	8.1	754	-	-	-	1,450	-	-	9.6	49,100	-	127	1,220	401	442	442	< 1.0	< 1.0	-	< 1.0	-	-	< 20	-	0.0054			
	GL0-3-20170524	2017 05 24	8.05	769	-	-	-	1,420	-	-	13.3	48,700	-	131	1,110	368	396	-	-	-	-	< 1.0	-	-	< 20	-	0.0063			
	GL0-3-180529	2018 05 29	7.81	799	7.28	-	-	1826	1,480	5.47	0.0084	38	44,700	< 10	121	990	293	481	481	< 1.0	< 1.0	< 1.0	< 1.00	-	-	22	0.0084	-		
	GL0-3-190529	2019 05 29	7.77	1,110	7.12	-	-	2776	2,060	6.89	< 0.0050	82	67,000	12	154	920	613	525	525	< 1.0	< 1.0	< 1.0	< 1.00	< 1.00	< 20	< 0.0050	-			
	GL0-3-200310	2020 03 10	7.82	1,000	-	-	-	1,970	6.19	-	56	55,800	< 10	139	930	505	491	491	< 1.0	< 1.0	< 1.0	< 1.00	-	-	31	-	< 0.0050			
	GL1-1	GL 1-1-20091109	2009 11 09	-	866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GL1-1-20100810		2010 08 10	-	790	-	-	-	1,250	-	-	30	-	-	169	-	222	656	-	-	-	-	-	-	-	40	-	0.007			
GL30-1-20100810		Duplicate	-	780	-	-	-	1,300	-	-	40	-	-	168	-	219	660	-	-	-	-	-	-	-	10	-	0.008			
QA/QC RPD%			-	1	-	-	-	4	-	-	29	-	-	1	-	1	1	-	-	-	-	-	-	-	*	-	13			
GL1-1-20160531		2016 05 31	7.43	-	-	-	-	1,290	-	-	< 20	633	-	237	1,520	244	664	-	-	-	-	-	-	-	-	-	< 0.01			
GL1-1-20180927		2018 09 27	-	730	-	-	-	-	-	-	45	12	-	157	1,420	253	-	-	-	-	-	< 0.10	-	-	-	-	< 0.0050			
GL1-1-180612		2018 06 12	7.75	743	-	-	-	1,160	-	0.0115	62	58	< 10	173	1,250	242	627	627	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	0.0115	-			
GL1-1-190917		2019 09 17	7.94	763	-	-	-	1,200	4.15	-	76	< 10	< 10	153	1,520	269	628	628	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	-	< 0.0050			
GL1-1-200910		2020 09 10	8.12	746	-	-	-	1,200	3.45	-	52	< 10	< 10	131	1,570	284	646	646	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	-	< 0.0050			

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Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate		
GL1-2	GL 1-2-20091109	2009 11 09	-	909	-	-	-	-	-	-	< 10	-	-	191	-	201	675	-	-	-	-	-	-	-	-	60	-	-	
	GL1-2-20100810	2010 08 10	-	840	-	-	-	1,140	-	-	-	-	-	191	-	201	675	-	-	-	-	-	-	-	-	-	-	0.006	
	GL1-2-20160531	2016 05 31	7.66	-	-	-	-	1,190	-	-	< 20	29	-	232	1,420	209	660	-	-	-	-	-	-	-	-	-	-	< 0.01	
	GL1-2-180612	2018 06 12	7.84	790	-	-	-	1,230	-	0.0102	71	< 10	< 10	216	1,270	238	640	640	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	-	0.0102	-	
	GL1-2-20180927	2018 09 27	-	759	-	-	-	-	-	-	< 20	44	-	181	1,100	228	-	-	-	-	-	< 0.10	-	-	-	-	-	< 0.0050	
	GL1-2-190917	2019 09 17	7.98	762	-	-	-	1,240	4.46	-	32	< 10	< 10	166	1,330	256	662	662	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	-	-	< 0.0050	
	GL1-2-200910	2020 09 10	8.14	814	-	-	-	1,300	4.98	-	< 50	< 10	< 10	117	1,430	283	676	676	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	-	-	< 0.0050	
GL2-1	GL 2-1-20091109	2009 11 09	-	348	-	-	-	-	-	-	-	-	-	22.5	-	212	306	-	-	-	-	-	-	-	-	10	-	0.004	
	GL 2-1-20120627	2012 06 27	-	380	-	-	-	670	-	-	50	-	-	-	-	212	306	-	-	-	-	-	-	-	-	< 10	-	0.004	
	GL2-1-20100810	2010 08 10	-	360	-	-	-	604	-	-	40	-	-	16.8	-	170	317	-	-	-	-	-	-	-	-	< 10	-	0.004	
	GL30-2-20100810	Duplicate	-	350	-	-	-	650	-	-	30	-	-	15.9	-	173	320	-	-	-	-	-	-	-	-	< 10	-	0.006	
	QA/QC RPD%		-	3	-	-	-	7	-	-	29	-	-	6	-	2	1	-	-	-	-	-	-	-	-	*	-	*	
	GL2-1-20110629	2011 06 29	-	359	-	-	-	638	-	-	50	-	-	21.3	-	203	302	-	-	-	-	-	-	-	-	< 10	-	0.09	
	GL2-1-20111217	2011 12 17	-	372	-	-	-	640	-	-	20	< 10	-	18.1	-	207	332	-	-	-	-	-	-	-	-	< 10	-	< 0.01	
	GL2-1-20121204	2012 12 04	-	348	-	-	-	642	-	-	90	< 100	-	18	-	192	326	-	-	-	-	-	-	-	-	14	-	< 0.002	
	GL2-1-20130626	2013 06 26	-	418	-	-	-	660	-	-	34.3	< 50	-	23.2	830	225	291	-	-	-	-	< 0.50	-	-	< 20	-	-	-	
	GL2-1-20140603	2014 06 03	-	418	-	-	-	707	-	-	17	54	-	32	770	266	292	-	-	-	-	< 0.50	-	-	< 20	-	0.0034		
	DUP3-20140603	Duplicate	-	412	-	-	-	710	-	-	17.2	82	-	33	750	260	293	-	-	-	-	< 0.50	-	-	< 20	-	0.0031		
	QA/QC RPD%		-	1	-	-	-	0	-	-	*	41	-	3	3	2	0	-	-	-	-	*	-	-	-	*	-	*	
	GL2-1-20141124	2014 11 24	-	429	-	-	-	688	-	-	39.8	372	-	27.8	790	233	275	-	-	-	-	< 0.50	-	-	< 20	-	0.0044		
	GL2-1-20150608	2015 06 08	7.89	444	-	-	-	713	-	-	14.6	36	-	34.5	730	281	306	-	-	-	-	0.31	-	-	< 20	-	0.0027		
	GL2-1-20151103	2015 11 03	8.05	424	-	-	-	688	-	-	37.1	< 25	-	28.2	760	246	358	-	-	-	-	0.27	-	-	< 20	-	0.0028		
	GL2-1-20160524	2016 05 24	8.21	445	-	-	-	730	-	-	< 5.0	97	-	34.9	720	275	289	289	< 1.0	< 1.0	-	0.31	-	-	< 20	-	0.0033		
	DUP2-20160524	Duplicate	8.2	439	-	-	-	718	-	-	< 5.0	68	-	35.9	740	283	289	289	< 1.0	< 1.0	-	0.35	-	-	< 20	-	0.0027		
	QA/QC RPD%		0	1	-	-	-	2	-	-	*	35	-	3	3	3	0	0	*	*	-	*	-	-	*	-	*	*	
	GL2-1-20170524	2017 05 24	8.25	466	-	-	-	815	-	-	53.7	< 25	-	45.3	670	323	259	-	-	-	-	0.39	-	-	< 20	-	0.0016		
	GL2-1-180528	2018 05 28	7.90	457	-	-	-	845	1.46	< 0.0050	92	< 250	< 250a	35.6	510	319	257	257	< 1.0	< 1.0	< 1.0	< 2.50	-	-	< 20	< 0.0050	-		
	GL2-1-190523	2019 05 23	8.11	505	7.57	-	1119	903	1.77	< 0.0050	63	16	< 10	46.4	510	370	260	260	< 1.0	< 1.0	< 1.0	0.32	-	-	< 20	< 0.0050	-		
	GL2-1-200609	2020 06 09	7.90	556	7.36	-	1,202	970	1.54	-	90	< 1,000	< 1,000a	54.0	< 10,000a	410	254	254	< 1.0	< 1.0	< 1.0	< 10.0	-	-	< 20	-	-	< 0.500	
	GL2-1-200820	2020 08 20	8.10	473	7.46	-	1,435	1,000	1.72	-	73	-	-	63.4	-	-	237	237	< 1.0	< 1.0	< 1.0	0.44	-	-	< 20	-	-	< 0.0050	
	DUPA-200820	Duplicate	8.10	476	7.46	-	1,435	992	2.18	-	69	-	-	63.2	-	-	240	240	< 1.0	< 1.0	< 1.0	0.44	-	-	< 20	-	-	< 0.0050	
	QA/QC RPD%		0	1	*	-	*	1	*	-	*	-	-	0	-	-	1	1	*	*	-	*	-	-	*	-	*	*	
	GL2-1-201019	2020 10 19	8.10	513	7.6	-	1,508	1,030	2.10	-	131	< 10	< 10	66.4	580	443	216	216	< 1.0	< 1.0	< 1.0	0.50	-	-	< 20	-	-	< 0.0050	
	GL2-1-210512	2021 05 12	8.06	515	7.55	-	1,440	1,020	1.71	-	58	< 10	< 10	64.5	510	415	240	240	< 1.0	< 1.0	< 1.0	0.53	-	-	< 20	-	-	< 0.0050	
	GL2-1-211005	2021 10 05	7.85	583	7.55	-	1,440	1,100	1.98	-	99	< 10	< 10	75.5	600	517	232	232	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	-	< 0.0050	
GL2-2	GL 2-2-20091109	2009 11 09	-	359	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GL2-2-20100810	2010 08 10	-	350	-	-	-	598	-	-	< 10	-	-	16.1	-	129	352	-	-	-	-	-	20	-	-	-	-	0.016	
	GL2-2-200826	2020 08 26	8.06	405	7.36	-	1,142	751	1.29	-	< 50	< 100	< 100	37.4	< 1,000	273	305	305	< 1.0	< 1.0	< 1.0	< 1.00	< 20	-	-	-	< 0.0500		
	GL2-2-201020	2020 10 20	7.91	464	7.55	-	1,234	810	1.25	-	< 50	< 10	< 10	46.7	660	309	283	283	< 1.0	< 1.0	< 1.0	0.29	< 20	-	-	-	-	< 0.0050	
	GL2-2-210513	2021 05 13	7.91	485	7.49	-	1,280	891	2.74	-	< 50	< 10	< 10	50.7	660	352	280	280	< 1.0	< 1.0	< 1.0	0.39	36	-	-	-	-	< 0.0050	
	GL2-2-211005	2021 10 05	7.92	511	7.45	-	1,199	894	1.72	-	61	< 10	< 10	48.1	620	370	285	285	< 1.0	< 1.0	< 1.0	< 1.00	< 20	-	-	-	-	< 0.0050	
GL3-2	GL3-2-20091116	2009 11 16	-	337	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL3-2-20100810	2010 08 10	-	320	-	-	-	750	-	-	140	-	-	9.52	-	278	379	-	-	-	-	-	10	-	-	-	-	0.024	

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters													Dissolved Inorganics											
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate
			mg/L	mg/L	mg/L	µS/cm	µS/cm	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
GL3-5	GL3-5-20130627	2013 06 27	-	1,260	-	-	-	1,950	-	-	48,000	< 100	-	90	960	< 10	2,100	-	-	-	-	< 1.0	-	-	152	-	-
	GL3-5 (2012)-20140609	2014 06 09	-	1,230	-	-	-	1,920	-	-	53,800	100	-	94	680	< 10	2,020	-	-	-	-	< 1.0	-	-	152	-	0.0016
	GL3-5 (2012)-20141125	2014 11 25	-	1,330	-	-	-	2,030	-	-	48,600	< 100	-	98	730	< 6.0	1,990	-	-	-	-	< 1.0	-	-	148	-	0.0018
	GL3-5 (2012)-20150609	2015 06 09	7.43	1,240	-	-	-	1,850	-	-	52,700	< 50	-	93.7	640	< 3.0	2,110	-	-	-	-	0.74	-	-	139	-	0.0015
	DUP1-20150609	Duplicate	7.41	1,230	-	-	-	1,860	-	-	48,100	< 25	-	92.6	600	< 1.5	2,140	-	-	-	-	0.8	-	-	138	-	0.0017
	QA/QC RPD%		0	1	-	-	-	1	-	-	9	*	-	1	6	*	1	-	-	-	-	8	-	-	1	-	*
	GL3-5 (2012)-20151109	2015 11 09	6.8	1,280	-	-	-	1,990	-	-	49,900	< 100	-	93	940	< 6.0	1,960	-	-	-	-	< 1.0	-	-	139	-	< 0.0010
GL4-1	GL 4-1-20091110	2009 11 10	-	630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GL 4-1-20120626	2012 06 26	-	-	-	-	-	1,170	-	-	-	-	-	7.4	-	142	792	-	-	-	-	-	-	-	-	-	-
	GL 4-1-20120704	2012 07 04	-	580	-	-	-	-	-	-	8,700	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	1.4
	GL4-1-20100810	2010 08 10	-	600	-	-	-	1,210	-	-	20	-	-	10.4	-	474	542	-	-	-	-	-	-	-	< 10	-	0.012
	GL4-1-20110629	2011 06 29	-	613	-	-	-	1,190	-	-	760	-	-	10.6	-	442	571	-	-	-	-	-	-	-	10	-	0.148
	GL4-1-20120625	2012 06 25	-	610	-	-	-	1,230	-	-	2,520	-	-	13.7	-	432	577	-	-	-	-	-	-	-	30	-	0.16
	GL4-1-20121203	2012 12 03	-	548	-	-	-	1,210	-	-	170	< 100	-	12.1	-	458	542	-	-	-	-	-	-	-	20	-	0.008
	GL4-1-20130627	2013 06 27	-	622	-	-	-	1,140	-	-	105	< 100	-	12	2,660	501	583	-	-	-	-	< 1.0	-	-	< 20	-	-
	DUP4-20130627	Duplicate	-	638	-	-	-	1,130	-	-	102	< 100	-	13	2,520	501	560	-	-	-	-	< 1.0	-	-	< 20	-	-
	QA/QC RPD%		-	3	-	-	-	1	-	-	3	*	-	8	5	0	4	-	-	-	-	*	-	-	*	-	-
	GL4-1-20140603	2014 06 03	-	597	-	-	-	1,140	-	-	94.6	< 100	-	15	2,180	482	527	-	-	-	-	< 1.0	-	-	< 20	-	0.006
	GL4-1-20141124	2014 11 24	-	646	-	-	-	1,160	-	-	102	< 100	-	16	2,510	514	524	-	-	-	-	< 1.0	-	-	< 20	-	0.0057
	GL4-1-20150608	2015 06 08	8	625	-	-	-	1,110	-	-	102	< 50	-	12.9	2,100	505	536	-	-	-	-	< 0.50	-	-	< 20	-	0.0068
	GL4-1-20151104	2015 11 04	8.09	591	-	-	-	1,130	-	-	117	< 50	-	12.2	2,010	492	522	-	-	-	-	< 0.50	-	-	< 20	-	0.0052
	GL4-1-200814	2020 08 14	8.18	642	7.95	-	1,846	1,280	2.82	-	126	< 100	< 100	16.7	1,540	498	563	563	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0500
	GL4-1-201016	2020 10 16	8.11	616	7.69	-	1,582	1,260	3.18	-	116	< 10	< 10	17.7	1,900	501	536	536	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	< 0.0050
	GL4-1-210511	2021 05 11	8.17	618	7.62	-	1,831	1,300	5.18	-	113	11	< 10	16.6	1,910	482	562	562	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	< 0.0050
	GL4-1-211005	2021 10 05	8.00	632	7.55	-	1,747	1,320	3.04	-	148	< 10	< 10	15.5	1,930	534	555	555	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0050
GL4-2	GL4-2-20091116	2009 11 16	-	1,040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GL4-2-20100810	2010 08 10	-	1,000	-	-	-	1,760	-	-	< 10	-	-	51.2	-	395	956	-	-	-	-	-	-	-	20	-	0.011
	GL4-2-20110629	2011 06 29	-	1,010	-	-	-	1,540	-	-	240	-	-	57	-	390	934	-	-	-	-	-	-	-	10	-	0.211
	GL4-2-20120626	2012 06 26	-	1,000	-	-	-	1,550	-	-	140	-	-	51.1	-	386	1,000	-	-	-	-	-	-	-	20	-	0.021
	GL4-2-20121203	2012 12 03	-	973	-	-	-	1,700	-	-	< 10	< 100	-	40.5	-	292	926	-	-	-	-	-	-	-	30	-	0.022
	GL4-2-200814	2020 08 14	8.04	846	7.71	-	2,259	1,610	5.89	-	< 50	< 100	< 100	61.7	2,040	480	845	845	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0500
	GL4-2-201030	2020 10 30	8.01	765	7.46	-	2,207	1,460	4.41	-	< 50	< 10	< 10	49.4	2,520	473	812	812	< 1.0	< 1.0	< 1.0	0.27	-	-	< 20	-	< 0.0050
	GL4-2-210511	2021 05 11	8.13	818	7.43	-	2,200	1,500	6.52	-	< 50	< 10	< 10	55.6	2,510	456	807	807	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0050
	GL4-2-211005	2021 10 05	7.95	829	7.40	-	2,023	1,760	4.25	-	59	< 10	< 10	46.0	2,670	475	843	843	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0050
	GL5-1-20091116	2009 11 16	-	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GL5-1	GL5-1-20100810	2010 08 10	-	110	-	-	-	1,690	-	-	250	-	-	42.2	-	283	1,210	-	-	-	-	-	-	-	< 10	-	0.002
	GL5-2-20180528	2018 05 28	7.83	671	-	-	-	1,370	-	-	52	6,270	-	266	500	201	472	472	< 1.0	< 1.0	-	< 5.00	-	-	< 20	-	< 0.0050

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GL5-2	GL5-2-20091116	2009 11 16	-	602	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GL30-1-20091116	Duplicate	-	597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	QA/QC RPD%			-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GL5-2-20100810	2010 08 10	-	640	-	-	-	1,050	-	< 10	-	-	183	-	168	527	-	-	-	-	-	-	-	-	10	-	0.006	
	GL30-3-20100810	Duplicate	-	640	-	-	-	1,120	-	< 10	-	-	181	-	167	526	-	-	-	-	-	-	-	-	10	-	0.007	
	QA/QC RPD%			-	0	-	-	6	-	-	-	-	1	-	1	0	-	-	-	-	-	-	-	-	-	-	15	
	GL5-2-20110704	2011 07 04	-	778	-	-	-	1,080	-	40	-	-	228	-	153	560	-	-	-	-	-	-	-	-	20	-	0.005	
	GL 5-2-20120627	2012 06 27	-	710	-	-	-	1,160	-	< 10	-	-	243	-	171	522	-	-	-	-	-	-	-	-	10	-	0.005	
	DUP C-20120627	Duplicate	-	730	-	-	-	1,130	-	30	-	-	246	-	171	520	-	-	-	-	-	-	-	-	40	-	0.005	
	QA/QC RPD%			-	3	-	-	3	-	-	-	-	1	-	0	0	-	-	-	-	-	-	-	-	-	-	0	
	GL5-2-20121205	2012 12 05	-	659	-	-	-	1,060	-	< 10	< 1,000	-	193	-	191	551	-	-	-	-	-	-	-	-	21	-	0.005	
	GL5-2-20130626	2013 06 26	-	726	-	-	-	1,150	-	< 5.0	< 100	-	256	1,160	181	580	-	-	-	-	-	< 1.0	-	-	37	-	-	
	GL5-2-20131114	2013 11 14	-	687	-	-	-	1,110	-	< 5.0	< 100	-	226	980	207	803	-	-	-	-	-	< 1.0	-	-	< 20	-	-	
	GL5-2-20140603	2014 06 03	-	655	-	-	-	1,130	-	< 5.0	< 100	-	248	980	191	600	-	-	-	-	-	< 1.0	-	-	21	-	0.0046	
	GL5-2-20141118	2014 11 18	-	636	-	-	-	1,000	-	5.9	< 100	-	176	940	210	691	-	-	-	-	-	< 1.0	-	-	< 20	-	0.0046	
	DUP2-20141118	Duplicate	-	635	-	-	-	1,070	-	< 5.0	< 100	-	177	950	211	683	-	-	-	-	-	< 1.0	-	-	24	-	0.0047	
	QA/QC RPD%			-	0	-	-	7	-	-	-	-	1	-	1	0	1	-	-	-	-	-	*	-	-	*	-	*
	GL5-2-20150608	2015 06 08	7.65	956	-	-	-	1,890	-	< 5.0	2,060	-	739	790	176	630	-	-	-	-	-	< 1.0	-	-	31	-	0.0036	
	GL5-2-20151103	2015 11 03	7.94	623	-	-	-	1,060	-	5	< 50	-	165	940	219	539	-	-	-	-	-	< 0.50	-	-	< 20	-	0.0049	
	GL5-2-20160526	2016 05 26	7.97	879	-	-	-	1,960	-	< 5.0	5,370	-	719	900	215	475	-	-	-	-	-	< 1.0	-	-	< 20	-	0.0031	
	GL5-2-20170525	2017 05 25	8.22	782	-	-	-	1,690	-	< 5.0	5,720	-	550	840	209	510	-	-	-	-	-	< 1.0	-	-	< 20	-	0.0037	
	DUP1-20170525	Duplicate	8.28	787	-	-	-	1,670	-	< 5.0	5,670	-	543	850	207	437	-	-	-	-	-	< 1.0	-	-	< 20	-	0.0038	
	QA/QC RPD%			1	1	-	-	1	-	-	-	-	1	1	1	15	-	-	-	-	-	*	-	-	-	-	*	
	GL5-2-180528	2018 05 28	7.83	671	7.08	-	2,100	1,370	4.60	< 0.0050	52	6,270	< 10	266	500	201	472	472	< 1.0	< 1.0	< 1.0	< 5.00	-	-	< 20	< 0.0050	-	
	GL5-2-190527	2019 05 27	7.96	638	7.43	-	2396	1,300	4.40	0.0051	38	9,010	< 10	319	650	332	488	488	< 1.0	< 1.0	< 1.0	0.24	-	-	< 20	0.0051	-	
	GL5-2-200611	2020 06 11	7.83	501	7.21	-	1,529	1,120	2.31	-	< 50	310	< 100	179	< 1,000	243	522	522	< 1.0	< 1.0	< 1.0	< 1.00	-	-	48	-	< 0.0500	
	GL5-2-210603	2021 06 03	8.05	709	7.20	-	2,417	1,390	3.35	-	< 50	1,840	< 10	353	800	249	490	490	< 1.0	< 1.0	< 1.0	0.52	-	-	26	-	< 0.0050	
GL5-3	GL5-3-20091116	2009 11 16	-	596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL5-3-20100810	2010 08 10	-	600	-	-	-	974	-	< 10	-	-	180	-	155	474	-	-	-	-	-	-	-	20	-	0.022		
GL6-1 (2011)	GL 6-1-20091110	2009 11 10	-	3,530	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL6-1-20110704	2011 07 04	-	1,220	-	-	-	9,120	-	230,000	-	-	840	-	930	6,900	-	-	-	-	-	-	-	1,120	-	5.6		
	GL 6-1 (2011)-20120626	2012 06 26	-	1,510	-	-	-	10,100	-	275,000	-	-	809	-	1,800	6,150	-	-	-	-	-	-	-	1,300	-	-		
	GL 6-1 (2011)-20120704	2012 07 04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.6		
	GL6-1 (2011)-20130627	2013 06 27	-	1,200	-	-	-	9,310	-	251,000	< 250	-	951	1,100	779	6,020	-	-	-	-	-	10.4	-	-	1,220	-	-	
	GL6-1-20131114	2013 11 14	-	1,650	-	-	-	12,400	-	235,000	< 500	-	965	438	3,740	7,020	-	-	-	-	-	10	-	-	1,120	-	-	
	GL6-1 (2011)-20140609	2014 06 09	-	1,300	-	-	-	9,450	-	252,000	550	-	872	< 1,000	2,030	5,810	-	-	-	-	-	8.7	-	-	987	-	4.94	
	GL6-1 (2011)-20141127	2014 11 27	-	1,580	-	-	-	13,800	-	234,000	840	-	943	449	3,480	7,150	7,150	< 100	< 100	-	-	9.4	-	-	1,030	-	6.39	
	GL6-1 (2011)-20150615	2015 06 15	7.83	1,030	-	-	-	9,280	-	254,000	< 500	-	936	< 2,000a	1,710	5,920	-	-	-	-	-	9.4	-	-	1,110	-	4.24	

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics												
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate		
GL6-1 (2011) (cont'd)	GL6-1 (2011)-20170530	2017 05 30	7.4	1,260	-	-	-	7,540	-	-	119	< 250	-	941	< 1,000	1,210	4,370	-	-	-	-	8.4	-	-	< 20	-	2.69		
	GL6-1(2011)-20121205	2012 12 05	-	1,980	-	-	-	9,940	-	-	245,000	< 10,000a	-	828	-	2,080	614	-	-	-	-	-	-	-	1,280	-	4		
	GL6-1-180604	2018 06 04	7.45	1,900	6.987.0	15,700	14,230	10,800	339	0.224	334,000	< 5,000a	276	1,570	< 50,000a	12,000	3,960	3,960	< 1.0	< 1.0	< 1.0	< 50.0	0.49	1.08	881	0.224	-		
	GL6-1 (2011)-190603	2019 06 03	7.80	1,270	7.42	11,200	11903	6,100	175	1.15	227,000	< 1,000	< 1,000a	527	< 10,000a	2,380	3,600	3,600	< 1.0	< 1.0	< 1.0	< 10.0	0.82	8.44	705	1.15	-		
	DUP3-190603	Duplicate	7.72	1,240	7.42	-	11903	8,100	180	0.560	236,000	< 1,000	< 1,000a	559	< 10,000a	2,350	3,510	3,510	< 1.0	< 1.0	< 1.0	< 10.0	-	-	705	0.560	-		
	QA/QC RPD%		1	2	*	-	*	28	3	69	4	*	*	6	*	1	3	3	*	*	*	*	-	-	0	69	-		
	GL6-1-200611	2020 06 11	7.82	962	7.1	8,440	6,871	5,220	241	-	194,000	< 100	< 100	652	< 1,000	282	3,980	3,980	< 1.0	< 1.0	< 1.0	4.43	10.7	25.5	621	-	0.576		
	GL6-1-210610	2021 06 10	7.07.72	1,230	6.99	8,020	7,919	4,570	211	-	210,000	< 100	< 100	659	< 1,000	25.0	3,990	3,990	< 1.0	< 1.0	< 1.0	5.22	0.29	6.00	842	-	0.413		
	GL7-1	GL7-1-20110704	2011 07 04	-	1,190	-	-	-	2,560	-	-	400	-	-	69.3	-	735	1,410	-	-	-	-	-	-	-	30	-	0.006	
	GL7-1-20120625	2012 06 25	-	1,150	-	-	-	-	2,590	-	-	360	-	-	69.2	-	709	1,540	-	-	-	-	-	-	-	30	-	< 0.002	
GL7-1-20121205	2012 12 05	-	1,120	-	-	-	-	2,500	-	-	450	< 1,000	-	72	-	758	1,520	-	-	-	-	-	-	-	32	-	0.002		
GL7-1-20130626	2013 06 26	-	1,110	-	-	-	-	2,500	-	-	442	< 100	-	69	2,490	771	1,440	-	-	-	-	< 1.0	-	-	34	-	-		
GL7-1-20131114	2013 11 14	-	1,140	-	-	-	-	2,530	-	-	446	< 100	-	75	2,390	757	1,540	-	-	-	-	< 1.0	-	-	27	-	-		
DUP1-20131114	Duplicate	-	1,130	-	-	-	-	2,500	-	-	444	< 100	-	73	2,500	776	1,610	-	-	-	-	< 1.0	-	-	20	-	-		
QA/QC RPD%		-	1	-	-	-	-	1	-	-	0	*	-	3	4	2	4	-	-	-	-	*	-	-	*	-	-		
GL7-1-20140604	2014 06 04	-	1,190	-	-	-	-	2,560	-	-	435	< 100	-	57	2,420	671	1,780	-	-	-	-	< 1.0	-	-	24	-	< 0.0010		
GL7-1-20141125	2014 11 25	-	1,110	-	-	-	-	2,480	-	-	411	< 100	-	71	2,300	759	1,230	-	-	-	-	< 1.0	-	-	30	-	< 0.0010		
GL7-1-20150609	2015 06 09	7.32	1,090	-	-	-	-	2,430	-	-	408	< 25	-	58.4	1,770	669	1,800	-	-	-	-	0.54	-	-	28	-	0.0014		
GL7-1-20151109	2015 11 09	6.61	1,080	-	-	-	-	2,470	-	-	412	< 100	-	61	2,180	704	1,430	-	-	-	-	< 1.0	-	-	29	-	< 0.0010		
GL8-1	GL 8-1-20091110	2009 11 10	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GL8-1-20100810	2010 08 10	-	630	-	-	-	-	2,710	-	-	430	-	-	55.9	-	1,230	550	-	-	-	-	-	-	-	< 10	-	0.037		
GL8-2	GL 8-2-20091110	2009 11 10	-	1,190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GL8-2-20100810	2010 08 10	-	928	-	-	-	-	8,530	-	-	20	-	-	528	-	2,830	2,800	-	-	-	-	-	-	-	120	-	0.298		
GL8-2-20110627	2011 06 27	-	1,040	-	-	-	-	7,520	-	-	220	-	-	512	-	2,760	2,520	-	-	-	-	-	-	-	100	-	0.158		
GL8-2-20111217	2011 12 17	-	652	-	-	-	-	7,360	-	-	60	< 100	-	511	-	2,940	2,470	-	-	-	-	-	-	-	120	-	0.35		
GL 8-2-20120626	2012 06 26	-	800	-	-	-	-	5,610	-	-	130	-	-	390	-	1,970	2,080	-	-	-	-	-	-	-	120	-	-		
DUP B-20120626	Duplicate	-	800	-	-	-	-	7,250	-	-	140	-	-	467	-	2,550	2,510	-	-	-	-	-	-	-	90	-	-		
QA/QC RPD%		-	0	-	-	-	-	26	-	-	7	-	-	18	-	26	19	-	-	-	-	-	-	-	29	-	-		
GL 8-2-20120704	2012 07 04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05		
GL8-2-20121204	2012 12 04	-	581	-	-	-	-	7,350	-	-	90	220	-	478	-	2,830	2,600	-	-	-	-	-	-	-	113	-	0.324		
GL8-2-20130626	2013 06 26	-	1,180	-	-	-	-	7,140	-	-	64.4	350	-	459	3,200	3,260	1,930	-	-	-	-	3.6	-	-	487	-	-		
GL8-2-20131113	2013 11 13	-	800	-	-	-	-	7,050	-	-	25.8	< 250	-	460	3,600	2,870	2,210	-	-	-	-	-	-	-	76	-	-		
DUP2-20131113	Duplicate	-	808	-	-	-	-	7,070	-	-	22.6	< 250	-	459	3,600	2,870	2,130	-	-	-	-	-	-	-	80	-	-		
QA/QC RPD%		-	1	-	-	-	-	0	-	-	*	*	-	0	0	0	4	-	-	-	-	-	-	-	5	-	-		
GL8-2-20140605	2014 06 05	-	768	-	-	-	-	6,600	-	-	14	6,340	-	390	3,000	3,000	1,850	-	-	-	-	3.4	-	-	68	-	0.0704		
GL8-2-20141118	2014 11 18	-	626	-	-	-	-	5,580	-	-	15.6	2,770	-	389	3,700	2,840	2,040	-	-	-	-	2.5	-	-	78	-	0.166		

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Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics										
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate
GL8-2 (cont'd)	GL8-2-20150610	2015 06 10	8.29	837	-	-	-	6,800	-	-	18.1	15,700	-	390	2,700	3,320	1,630	-	-	-	-	2.6	-	-	64	-	0.0773
	DUP 2-20150610	Duplicate	8.3	833	-	-	-	6,900	-	-	20.5	15,400	-	383	2,700	3,280	1,650	-	-	-	-	2.7	-	-	70	-	0.0795
	QA/QC RPD%		0	0	-	-	-	1	-	-		2	-	2	0	1	1	-	-	-	-	4	-	-	9	-	3
GL9-1	GL8-2-20151103	2015 11 03	8.03	683	-	-	-	6,730	-	-	12.4	11,200	-	392	3,700	3,290	1,580	-	-	-	-	2.7	-	-	59	-	0.141
	GL 9-1-20091111	2009 11 11	-	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GL9-1-20100810	2010 08 10	-	610	-	-	-	1,470	-	-	230	-	-	126	-	300	923	-	-	-	-	-	-	-	< 10	-	0.003
	GL9-1-20110628	2011 06 28	-	375	-	-	-	1,220	-	-	120	-	-	132	-	270	677	-	-	-	-	-	-	-	< 10	-	0.026
	GL 9-1-20120627	2012 06 27	-	420	-	-	-	1,320	-	-	140	-	-	153	-	263	690	-	-	-	-	-	-	-	20	-	< 0.002
	GL9-1-20121204	2012 12 04	-	392	-	-	-	1,350	-	-	160	< 100	-	152	-	299	684	-	-	-	-	-	-	-	18	-	< 0.002
	GL9-1-20130626	2013 06 26	-	418	-	-	-	1,260	-	-	167	< 100	-	153	770	279	727	-	-	-	-	< 1.0	-	-	< 20	-	-
	GL9-1-20131114	2013 11 14	-	410	-	-	-	1,230	-	-	155	< 100	-	155	580	254	872	-	-	-	-	< 1.0	-	-	< 20	-	-
	GL9-1-20140604	2014 06 04	-	374	-	-	-	1,190	-	-	106	< 100	-	156	820	244	879	-	-	-	-	< 1.0	-	-	< 20	-	< 0.0010
	DUP1-20140604	Duplicate	-	366	-	-	-	1,190	-	-	92.2	< 50	-	153	720	238	849	-	-	-	-	0.63	-	-	< 20	-	< 0.0010
	QA/QC RPD%		-	2	-	-	-	0	-	-	14	*	-	2	13	2	3	-	-	-	-	*	-	-	*	-	*
	GL9-1-20141125	2014 11 25	-	404	-	-	-	1,310	-	-	189	< 100	-	154	640	250	776	-	-	-	-	< 1.0	-	-	28	-	< 0.0010
	GL9-1-20150609	2015 06 09	8.9	332	-	-	-	1,140	-	-	76.2	< 25	-	153	590	224	833	-	-	-	-	0.72	-	-	< 20	-	< 0.0010
	GL9-1-20151109	2015 11 09	8.97	326	-	-	-	1,220	-	-	74.2	< 100	-	153	600	218	684	-	-	-	-	< 1.0	-	-	< 20	-	< 0.0010
	GL9-1-20170530	2017 05 30	8.9	363	-	-	-	1,150	-	-	314,000	< 50	-	159	660	223	693	-	-	-	-	0.71	-	-	1,150	-	< 0.0010
	GL9-1-180604	2018 06 04	8.03	480	7.21	-	2,027	1,390	2.53	< 0.0050	261	< 100	< 10	153	650	314	739	739	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	< 0.0050	-
	GL9-1-190530	2019 05 30	8.33	407	8.25	-	1961	1,330	1.44	< 0.0050	280	< 10	< 10	140	720	270	713	701	12.0	< 1.0	6.0	0.39	-	-	< 20	< 0.0050	-
	GL9-1-200611	2020 06 11	7.90	584	7.06	-	2,032	1,470	1.77	-	255	< 100	< 100	109	< 1,000	267	1,060	1,060	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0500
	DUPC-200611	Duplicate	7.86	570	-	-	-	1,450	1.26	-	255	< 100	< 100	113	< 1,000	276	1,050	1,050	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0500
	QA/QC RPD%		1	2	-	-	-	1	*	-	0	*	*	4	*	3	1	1	*	*	*	*	-	-	*	-	*
	GL9-1-210611	2021 06 11	7.75	746	6.79	-	2,568	1,630	0.74	-	239	< 100	< 100	99.0	< 1,000	277	1,220	1,220	< 1.0	< 1.0	< 1.0	< 1.00	-	-	35	-	< 0.0500
GL9-2	GL 9-2-20091111	2009 11 11	-	9,260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GL9-2-20100810	2010 08 10	-	6,980	-	-	-	40,200	-	-	800	-	-	1,300	-	23,000	720	-	-	-	-	-	-	-	100	-	0.011
	GL9-2-20110628	2011 06 28	-	8,320	-	-	-	40,500	-	-	40	-	-	1,150	-	25,300	606	-	-	-	-	-	-	-	110	-	0.095
	GL 9-2-20120627	2012 06 27	-	8,200	-	-	-	41,400	-	-	< 10	-	-	1,130	-	26,000	588	-	-	-	-	-	-	-	190	-	0.006
	GL9-2-20121204	2012 12 04	-	8,370	-	-	-	39,400	-	-	100	< 1,000	-	1,210	-	27,000	564	-	-	-	-	-	-	-	101	-	0.009
	Dup-B-20121204	Duplicate	-	7,980	-	-	-	39,800	-	-	< 10	< 1,000	-	1,120	-	27,100	564	-	-	-	-	-	-	-	89	-	0.006
	QA/QC RPD%		-	5	-	-	-	1	-	-	*	*	-	8	-	0	0	-	-	-	-	-	-	-	13	-	40
	GL9-2-20130626	2013 06 26	-	7,670	-	-	-	40,500	-	-	140	< 500	-	1,250	3,040	26,900	898	-	-	-	-	< 5.0	-	-	78	-	-
	DUP2-20130626	Duplicate	-	7,870	-	-	-	41,900	-	-	129	< 500	-	1,240	3,300	26,800	1,000	-	-	-	-	< 5.0	-	-	82	-	-
	QA/QC RPD%		-	3	-	-	-	3	-	-	8	*	-	1	8	0	11	-	-	-	-	*	-	-	5	-	-
	GL9-2-20131113	2013 11 13	-	7,950	-	-	-	40,900	-	-	485	< 500	-	1,250	3,100	25,500	950	-	-	-	-	-	-	-	64	-	-
	GL9-2-20140605	2014 06 05	-	8,100	-	-	-	39,300	-	-	11.9	720	-	1,230	3,240	26,100	1,030	-	-	-	-	7.8	-	-	78	-	0.0054
	GL9-2-20141125	2014 11 25	-	7,700	-	-	-	40,600	-	-	54.3	730	-	1,290	3,780	27,500	502	-	-	-	-	5.6	-	-	68	-	0.0054
	GL9-2-20150609	2015 06 09	8.05	7,650	-	-	-	38,700	-	-	92.3	< 500	-	1,270	2,400	27,100	1,080	-	-	-	-	5.9	-	-	64	-	0.0052
	GL9-2-20151104	2015 11 04	7.92	7,360	-	-	-	40,400	-	-	50.4	< 500	-	1,200	3,300	26,200	547	-	-	-	-	5.6	-	-	53	-	0.0057

Associated CARO files available upon request.

Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.

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QA/QC RPD Denotes quality assurance/quality control relative percent difference

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

RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters															Dissolved Inorganics											
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate		
GL9-3	GL 9-3-20091111	2009 11 11	-	217	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL9-3-20100810	2010 08 10	-	10,500	-	-	-	48,500	-	-	< 10	-	-	1,610	-	29,400	944	-	-	-	-	-	-	-	100	-	0.028		
	GL9-3-20110628	2011 06 28	-	12,300	-	-	-	49,600	-	-	20	-	-	1,450	-	31,400	930	-	-	-	-	-	-	-	180	-	0.033		
	GL9-A-20110628	Duplicate	-	11,400	-	-	-	50,100	-	-	30	-	-	1,400	-	31,500	932	-	-	-	-	-	-	-	190	-	0.032		
	QA/QC RPD%		-	8	-	-	-	1	-	-	*	-	-	4	-	0	0	-	-	-	-	-	-	-	5	-	3		
	GL 9-3-20120627	2012 06 27	-	11,000	-	-	-	51,700	-	-	30	-	-	1,360	-	31,400	948	-	-	-	-	-	-	-	230	-	0.008		
	GL9-3-20121204	2012 12 04	-	10,400	-	-	-	50,200	-	-	< 10	< 1,000	-	1,500	-	31,800	947	-	-	-	-	-	-	-	156	-	< 0.002		
	GL9-3-20130626	2013 06 26	-	10,400	-	-	-	51,900	-	-	17.1	< 500	-	1,540	2,340	32,600	1,420	-	-	-	-	< 5.0	-	-	100	-	-		
	GL9-3-20131113	2013 11 13	-	10,500	-	-	-	49,000	-	-	9.6	560	-	1,590	2,420	31,500	1,450	-	-	-	-	-	-	-	281	-	-		
	GL9-3-20140605	2014 06 05	-	10,800	-	-	-	48,700	-	-	7.4	< 500	-	1,530	2,320	31,800	1,580	-	-	-	-	10.5	-	-	88	-	0.0051		
	GL9-3-20141125	2014 11 25	-	10,400	-	-	-	49,300	-	-	10.5	< 500	-	1,600	3,020	32,800	989	-	-	-	-	7.2	-	-	105	-	0.0054		
	DUP4-20141124	Duplicate	-	10,400	-	-	-	49,800	-	-	10.7	650	-	1,610	3,030	33,100	1,010	-	-	-	-	8	-	-	121	-	0.0074		
	QA/QC RPD%		-	0	-	-	-	1	-	-	*	*	-	1	0	1	2	-	-	-	-	11	-	-	14	-	31		
	GL9-3-20150609	2015 06 09	7.92	10,400	-	-	-	48,200	-	-	16.5	< 500	-	1,590	< 2,000a	33,500	1,530	-	-	-	-	8.5	-	-	91	-	0.0042		
	GL9-3-20151109	2015 11 09	7.69	9,720	-	-	-	50,200	-	-	9.9	< 500	-	1,530	3,200	32,100	926	-	-	-	-	6.2	-	-	124	-	0.0043		
	GL9-3-20160526	2016 05 26	7.78	10,600	-	-	-	62,800	-	-	10.4	< 500	-	1,780	3,500	37,100	915	-	-	-	-	10.8	-	-	78	-	0.0049		
	GL9-3-20170529	2017 05 29	7.9	11,100	-	-	-	46,400	-	-	30.5	< 500	-	1,680	2,700	34,600	834	-	-	-	-	11.2	-	-	80	-	0.0065		
	GL9-3-180528	2018 05 28	7.68	11,300	7.22	-	-	3,210	53,000	25.1	< 0.0050	69	6,320	< 1,000a	238	4,350	199	862	862	< 1.0	< 1.0	< 1.0	< 10.0	-	-	86	< 0.0050	-	
	GL9-3-190527	2019 05 27	7.73	12,600	7.54	-	-	44350	52,300	24.8	< 0.500	73	< 1,000	< 1,000a	1,540	< 10,000a	31,700	859	859	< 1.0	< 1.0	< 1.0	< 10.0	-	-	83	< 0.500	-	
	GL9-3-200608	2020 06 08	7.80	10,200	7.32	-	-	36,600	52,600	23.6	-	< 50	< 5,000a	< 5,000a	1,400	< 50,000a	34,500	921	921	< 1.0	< 1.0	< 1.0	< 50.0	-	-	79	-	< 2.50	
	GL9-3-210610	2021 06 10	7.74	10,700	7.29	-	-	41,476	54,200	18.8	-	< 50	< 1,000	< 1,000	1,600	< 10,000a	32,300	943	943	< 1.0	< 1.0	< 1.0	< 10.0	-	-	104	-	< 0.500	
GL10-1	GL10-1-20091112	2009 11 12	-	7,010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL10-1-20100810	2010 08 10	-	6,430	-	-	-	31,200	-	-	170	-	-	1,400	-	14,800	3,470	-	-	-	-	-	-	-	480	-	0.059		
	GL10-1-20110704	2011 07 04	-	8,310	-	-	-	31,700	-	-	140	-	-	1,420	-	17,600	3,200	-	-	-	-	-	-	-	210	-	0.035		
	GL10-1-20120626	2012 06 26	-	8,760	-	-	-	33,800	-	-	140	-	-	1,450	-	19,300	2,640	-	-	-	-	-	-	-	230	-	0.006		
	GL10-1-20121204	2012 12 04	-	8,350	-	-	-	33,000	-	-	210	< 1,000	-	1,270	-	19,400	267	-	-	-	-	-	-	-	228	-	0.004		
	GL10-1-20130626	2013 06 26	-	7,720	-	-	-	31,400	-	-	142	< 500	-	1,270	1,860	18,800	2,540	-	-	-	-	10.5	-	-	166	-	-		
	GL10-1-20140605	2014 06 05	-	6,550	-	-	-	28,900	-	-	81.5	< 500	-	1,130	1,900	17,400	2,560	-	-	-	-	11.1	-	-	145	-	0.0044		
	GL10-1-20141125	2014 11 25	-	6,570	-	-	-	28,000	-	-	129	710	-	1,250	2,250	19,100	2,180	-	-	-	-	9.5	-	-	177	-	0.0063		
	GL10-1-20150610	2015 06 10	7.95	6,240	-	-	-	26,600	-	-	170	< 500	-	1,020	< 2,000a	16,300	2,300	-	-	-	-	8.7	-	-	145	-	0.0024		
	GL10-1-20151109	2015 11 09	7.57	5,980	-	-	-	25,100	-	-	152	< 500	-	963	< 2,000a	15,500	1,950	-	-	-	-	7.4	-	-	210	-	0.0019		
	DUP2-20151109	Duplicate	7.64	5,800	-	-	-	25,200	-	-	173	< 500	-	998	2,200	16,100	1,960	-	-	-	-	7.9	-	-	126	-	0.0028		
	QA/QC RPD%		1	3	-	-	-	0	-	-	13	*	-	4	*	4	1	-	-	-	-	7	-	-	50	-	*		

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Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics													
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate			
GL12-1	GL12-1-20091112	2009 11 12	-	3,250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	GL12-1-20100811	2010 08 11	-	3,080	-	-	-	7,420	-	-	< 10	-	-	174	-	3,890	558	-	-	-	-	-	-	-	50	-	0.004			
	GL12-1-20110629	2011 06 29	-	3,310	-	-	-	7,330	-	-	20	-	-	151	-	4,240	544	-	-	-	-	-	-	-	30	-	0.095			
	GL30-1-20110629	Duplicate	-	3,400	-	-	-	7,270	-	-	30	-	-	151	-	4,190	542	-	-	-	-	-	-	-	20	-	0.092			
	QA/QC RPD%		-	3	-	-	-	1	-	-	*	-	-	0	-	1	0	-	-	-	-	-	-	-	*	-	3			
	GL 12-1-20111218	2011 12 18	-	3,160	-	-	-	8,050	-	-	< 10	3,660	-	168	-	3,040	571	-	-	-	-	-	-	-	40	-	0.03			
	GL12-1-20120625	2012 06 25	-	3,520	-	-	-	7,750	-	-	< 10	-	-	173	-	4,400	589	-	-	-	-	-	-	-	70	-	0.003			
	GL12-1-20121204	2012 12 04	-	3,610	-	-	-	7,920	-	-	< 10	5,830	-	182	-	4,770	606	-	-	-	-	-	-	-	72	-	0.007			
	GL12-1-20130626	2013 06 26	-	3,720	-	-	-	8,440	-	-	5.4	8,300	-	222	2,200	4,980	767	-	-	-	-	< 2.5	-	-	63	-	-			
	GL12-1-20131113	2013 11 13	-	3,900	-	-	-	8,560	-	-	6.7	5,870	-	251	1,800	4,820	860	-	-	-	-	-	-	-	69	-	-			
	GL12-1-20140604	2014 06 04	-	4,090	-	-	-	9,790	-	-	69.6	2,640	-	467	2,900	5,550	1,170	-	-	-	-	< 2.5	-	-	258	-	0.357			
	GL12-1-20141118	2014 11 18	-	3,910	-	-	-	9,400	-	-	86.6	< 250	-	404	1,600	5,610	1,110	-	-	-	-	< 2.5	-	-	219	-	0.0076			
	GL12-1-20150609	2015 06 09	7.68	3,880	-	-	-	7,990	-	-	274	< 100	-	607	1,830	4,560	842	-	-	-	-	< 1.0	-	-	378	-	0.0016			
	DUP3-20150609	Duplicate	7.64	3,900	-	-	-	8,000	-	-	279	< 50	-	603	1,650	4,430	855	-	-	-	-	0.63	-	-	372	-	0.0011			
	QA/QC RPD%		1	1	-	-	-	0	-	-	2	*	-	1	10	3	2	-	-	-	-	*	-	-	2	-	*			
	GL12-1-20151104	2015 11 04	7.31	3,480	-	-	-	8,290	-	-	252	< 250	-	455	2,000	4,980	744	-	-	-	-	< 2.5	-	-	260	-	< 0.0010			
	GL12-1-20160524	2016 05 24	7.14	3,840	-	-	-	8,210	-	-	467	< 250	-	500	2,000	4,600	768	768	< 1.0	< 1.0	-	< 2.5	-	-	393	-	< 0.0010			
	GL12-1-20160921	2016 09 21	7.34	3,590	-	-	-	8,290	-	-	648	< 250	-	574	2,000	4,430	824	-	-	-	-	< 2.5	-	-	657	-	0.0062			
	GL12-1-20170529	2017 05 29	7.17	2,610	-	-	-	7,280	-	-	2,020	< 250	-	514	1,700	3,850	823	-	-	-	-	< 2.5	-	-	1,070	-	0.372			
	GL12-1-20170926	2017 09 26	7.39	3,240	-	-	-	6,500	-	-	1,720	< 100	-	556	1,750	3,540	877	-	-	-	-	< 1.0	-	-	751	-	0.157			
	GL12-1-180604	2018 06 04	7.31	3,390	6.73	-	58,741	6,950	382	0.0074	1,430	< 5,000a	< 10	1,050	1,220	9,180	865	865	< 1.0	< 1.0	< 1.0	< 50.0	-	-	542	0.0074	-			
	GL12-1-180919	2018 09 19	7.07	3,890	6.99	-	5,880	7,730	190	< 0.0050	1,840	< 100	< 100	495	1,840	3,660	882	882	< 1.0	< 1.0	< 1.0	< 1.00	-	-	513	< 0.0050	-			
	GL12-1-190527	2019 05 27	7.49	3,850	6.75	-	8360	7,860	155	0.0125	1,750	59	24	480	1,560	3,800	907	907	< 1.0	< 1.0	< 1.0	0.33	-	-	485	0.0125	-			
	GL12-1-190919	2019 09 19	7.43	3,830	6.81	-	7380	7,920	175	-	1,270	< 100	< 100	496	1,190	3,620	886	886	< 1.0	< 1.0	< 1.0	< 1.00	-	-	458	-	< 0.0500			
	GL12-1-200610	2020 06 10	7.39	4,490	6.78	-	6,947	8,040	203	-	4,260	< 100	< 100	610	1,200	3,880	997	997	< 1.0	< 1.0	< 1.0	< 1.00	-	-	544	-	< 0.0500			
	GL12-1-201102	2020 11 02	7.51	4,720	6.64	-	8,081	8,040	179	-	7,300	< 1,000	< 10	603	1,400	3,820	948	948	< 1.0	< 1.0	< 1.0	0.84	-	-	566	-	< 0.0050			
	GL12-1-210525	2021 05 25	7.69	4,090	6.69	-	7,982	7,150	156	-	4,360	< 1,000	< 10	568	1,430	3,850	915	915	< 1.0	< 1.0	< 1.0	< 10.0	-	-	563	-	< 0.0050			
	GL12-1-211005	2021 10 05	7.27	4,140	6.67	-	7,452	7,940	174	-	4,660	< 100	< 100	579	1,300	4,280	928	928	< 1.0	< 1.0	< 1.0	< 1.00	-	-	536	-	< 0.0500			
GL13-1	GL13-1-20091117	2009 11 17	-	3,530	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	GL13-1-20100811	2010 08 11	-	3,550	-	-	-	11,200	-	-	< 10	-	-	178	-	5,870	640	-	-	-	-	-	-	-	10	-	0.005			
	GL13-1-20110627	2011 06 27	-	3,950	-	-	-	10,800	-	-	< 10	-	-	196	-	6,580	666	-	-	-	-	-	-	-	30	-	0.007			
	GL13-1-20111217	2011 12 17	-	3,500	-	-	-	10,900	-	-	40	220	-	183	-	5,900	682	-	-	-	-	-	-	-	30	-	0.03			
	DUPC-20111217	Duplicate	-	113	-	-	-	1,570	-	-	410	< 50	-	72.6	-	2.3	1,420	-	-	-	-	-	-	-	< 10	-	0.02			
	QA/QC RPD%		-	187	-	-	-	150	-	-	*	*	-	86	-	200	70	-	-	-	-	-	-	-	*	-	40			
	GL13-1-20120625	2012 06 25	-	3,580	-	-	-	9,930	-	-	< 10	-	-	170	-	5,900	647	-	-	-	-	-	-	-	30	-	0.007			
GL13-1-20121204	2012 12 04	-	3,440	-	-	-	9,990	-	-	< 10	< 1,000	-	174	-	5,750	672	-	-	-	-	-	-	-	41	-	0.006				

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Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics													
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate			
GL14-1	GL14-1-20091116	2009 11 16	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	GL14-1-20100811	2010 08 11	-	40	-	-	-	1,120	-	-	40	-	-	7	-	141	783	-	-	-	-	-	-	-	< 10	-	0.051			
	GL14-1-20110704	2011 07 04	-	48	-	-	-	1,100	-	-	60	-	-	8.6	-	132	809	-	-	-	-	-	-	-	30	-	0.11			
	GL14-1-20120627	2012 06 27	-	40	-	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-			
	GL14-1-20120704	2012 07 04	-	-	-	-	-	1,120	-	-	-	-	-	0.11	-	141	799	-	-	-	-	-	-	-	-	-	0.125			
GL15-1	GL14-1-20121204	2012 12 04	-	35	-	-	-	1,190	-	-	70	< 100	-	8.66	-	145	790	-	-	-	-	-	-	-	26	-	0.137			
	GL15-1-20091117	2009 11 17	-	702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	GL30-3-20091117	Duplicate	-	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	QA/QC RPD%		-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	GL15-1-20140604	2014 06 04	-	335	-	-	-	782	-	-	15.2	233	-	6.7	2,190	261	446	-	-	-	-	< 0.50	-	-	< 20	-	0.076			
	GL15-1-20141117	2014 11 17	-	340	-	-	-	793	-	-	38.3	72	-	10	1,950	280	479	-	-	-	-	< 0.50	-	-	< 20	-	0.0409			
	GL15-1-20150610	2015 06 10	8.32	339	-	-	-	959	-	-	32.2	< 25	-	4.9	1,310	175	468	-	-	-	-	< 0.25	-	-	< 20	-	0.0308			
	DUP4-20150610	Duplicate	8.3	326	-	-	-	804	-	-	32	< 25	-	7.2	1,960	269	469	-	-	-	-	< 0.25	-	-	< 20	-	0.0283			
	QA/QC RPD%		0	4	-	-	-	18	-	-	1	*	-	38	40	42	0	-	-	-	-	*	-	-	*	-	8			
	GL15-1-20151103	2015 11 03	8.12	336	-	-	-	814	-	-	47.7	< 25	-	8.5	1,900	269	457	-	-	-	-	< 0.25	-	-	< 20	-	0.155			
	GL15-1-20160920	2016 09 20	8.01	385	-	-	-	874	-	-	17.8	89	-	12.3	1,760	295	446	-	-	-	-	< 0.25	-	-	< 20	-	0.0562			
	GL15-1-20170925	2017 09 25	8.1	326	-	-	-	767	-	-	12.5	98	-	8.1	2,090	264	428	-	-	-	-	< 0.25	-	-	< 20	-	0.0338			
	GL15-1-180928	2018 09 28	7.87	333	7.47	-	1,320	819	1.75	< 0.0050	78	23	< 10	8.32	1,810	280	441	441	< 1.0	< 1.0	< 1.0	< 0.10	-	-	21	< 0.0050	-			
	GL15-1-190924	2019 09 24	8.09	327	7.35	-	1259	826	1.68	-	240	< 10	< 10	7.96	1,970	263	442	442	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	< 0.0050			
	GL15-1-201104	2020 11 04	7.80	1,530	7.18	-	3,904	3,210	10.8	-	51	2,440	< 10	241	860	1,200	644	644	< 1.0	< 1.0	< 1.0	< 1.00	-	-	32	-	< 0.0050			
GL15-2	GL15-1-211007	2021 10 07	8.08	468	7.47	-	1,528	1,030	2.11	-	< 50	< 100	< 100	24.3	1,310	358	489	489	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0500			
	GL15-2-20110704	2011 07 04	-	2,090	-	-	-	3,760	-	-	< 10	-	-	52.4	-	1,900	650	-	-	-	-	-	-	-	20	-	0.024			
	GL15-2-20120627	2012 06 27	-	3,300	-	-	-	6,180	-	-	40	-	-	121	-	3,230	644	-	-	-	-	-	-	-	30	-	0.017			
	GL15-2-20121205	2012 12 05	-	3,580	-	-	-	6,750	-	-	< 10	< 10,000a	-	155	-	4,020	686	-	-	-	-	-	-	-	63	-	0.018			
	GL15-2-20130708	2013 07 08	-	3,920	-	-	-	7,970	-	-	< 5.0	8,850	-	143	< 1,000	4,190	822	-	-	-	-	< 2.5	-	-	30	-	-			
	GL15-2-20140604	2014 06 04	-	3,290	-	-	-	7,380	-	-	< 5.0	7,610	-	159	2,100	4,000	1,030	-	-	-	-	< 2.5	-	-	36	-	0.0188			
	GL15-2-20141117	2014 11 17	-	3,250	-	-	-	6,750	-	-	< 5.0	8,200	-	185	< 1,000	4,040	972	-	-	-	-	< 2.5	-	-	39	-	0.0193			
	GL15-2-20150610	2015 06 10	7.84	3,700	-	-	-	7,960	-	-	< 5.0	7,690	-	197	1,000	4,800	900	-	-	-	-	< 2.5	-	-	38	-	0.017			
	GL15-2-20151103	2015 11 03	7.5	3,910	-	-	-	7,970	-	-	< 5.0	7,470	-	182	1,100	4,800	807	-	-	-	-	< 2.5	-	-	32	-	0.0186			
	GL15-2-20160920	2016 09 20	7.4	5,010	-	-	-	10,400	-	-	< 5.0	3,700	-	259	1,400	6,740	807	-	-	-	-	< 2.5	-	-	45	-	0.0166			
	GL15-2-20170925	2017 09 25	7.59	4,190	-	-	-	8,470	-	-	7.6	3,120	-	181	1,300	4,560	794	-	-	-	-	< 2.5	-	-	41	-	0.0179			
	GL15-2-180928	2018 09 28	7.41	3,300	6.88	-	7,089	6,990	15.4	< 0.0050	73	2,590	< 10	214	1,030	3,730	765	765	< 1.0	< 1.0	< 1.0	< 1.00	-	-	38	< 0.0050	-			
	GL15-2-190924	2019 09 24	7.70	3,470	6.77	-	7047	7,220	12.2	-	< 20	3,550	< 100	246	< 1,000	4,060	748	748	< 1.0	< 1.0	< 1.0	< 1.00	-	-	26	-	< 0.0500			
	GL15-2-201104	2020 11 04	7.69	6,230	6.94	-	10,680	11,900	19.0	-	< 50	1,690	< 10	360	1,020	7,190	794	794	< 1.0	< 1.0	< 1.0	< 10.0	-	-	33	-	< 0.0050			
	DUP2-201104	Duplicate	7.67	6,360	-	-	-	11,200	19.5	-	< 50	1,790	< 10	367	970	7,160	797	797	< 1.0	< 1.0	< 1.0	< 10.0	-	-	32	-	< 0.0050			
QA/QC RPD%		0	2	-	-	-	6	3	-	*	6	*	2	5	0	0	0	*	*	*	*	*	-	*	-	*				
GL15-2-211007	2021 10 07	7.67	< 10.0	6.89	-	8,617	9,270	14.0	-	< 50	1,300	< 100	346	< 1,000	5,260	817	817	< 1.0	< 1.0	< 1.0	< 1.00	-	-	26	-	< 0.0500				

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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* RPDs are not calculated where one or more concentrations are less than five times RDL.
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Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics										
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate
GL16-1	GL 16-1-20091111	2009 11 11	-	1,840	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GL 16-1-20111217	2011 12 17	-	987	-	-	-	4,500	-	-	< 10	220	-	166	-	2,240	985	-	-	-	-	-	-	-	10	-	0.04
	GL16-1-20100811	2010 08 11	-	1,700	-	-	-	6,750	-	-	470	-	-	252	-	3,520	1,170	-	-	-	-	-	-	-	< 10	-	0.012
	GL16-1-20110627	2011 06 27	-	1,210	-	-	-	4,780	-	-	< 10	-	-	168	-	2,480	982	-	-	-	-	-	-	-	10	-	0.024
	GL30-1-20110627	Duplicate	-	1,200	-	-	-	4,790	-	-	30	-	-	165	-	2,330	980	-	-	-	-	-	-	-	20	-	0.023
	QA/QC RPD%		-	1	-	-	-	0	-	-	*	-	-	2	-	6	0	-	-	-	-	-	-	-	*	-	4
	GL16-1-20120626	2012 06 26	-	1,260	-	-	-	4,490	-	-	500	-	-	162	-	2,270	1,170	-	-	-	-	-	-	-	30	-	0.011
	GL16-1-20121204	2012 12 04	-	1,020	-	-	-	4,170	-	-	1,130	120	-	154	-	2,110	1,190	-	-	-	-	-	-	-	34	-	0.018
	GL16-1-20130626	2013 06 26	-	1,040	-	-	-	4,200	-	-	448	< 250	-	153	1,500	2,080	1,100	-	-	-	-	< 2.5	-	-	35	-	-
	GL16-1-20131113	2013 11 13	-	949	-	-	-	4,160	-	-	39.9	590	-	158	< 1,000	1,940	1,120	-	-	-	-	-	-	-	< 20	-	-
	GL16-1-20140605	2014 06 05	-	930	-	-	-	3,880	-	-	382	< 100	-	154	900	1,970	1,200	-	-	-	-	< 1.0	-	-	< 20	-	0.0033
	GL16-1-20141118	2014 11 18	-	845	-	-	-	3,830	-	-	125	150	-	148	890	1,850	1,170	-	-	-	-	< 1.0	-	-	< 20	-	0.017
	GL16-1-20150610	2015 06 10	7.96	900	-	-	-	3,880	-	-	350	< 100	-	155	880	1,960	1,050	-	-	-	-	< 1.0	-	-	< 20	-	0.0046
	GL16-1-20151103	2015 11 03	7.76	827	-	-	-	3,670	-	-	34.9	260	-	151	940	1,860	1,180	-	-	-	-	< 1.0	-	-	< 20	-	0.0451
	DUP3-20151103	Duplicate	7.64	828	-	-	-	3,630	-	-	36.3	230	-	145	900	1,780	943	-	-	-	-	< 1.0	-	-	< 20	-	0.0448
	QA/QC RPD%		2	0	-	-	-	1	-	-	4	12	-	4	4	4	22	-	-	-	-	*	-	-	*	-	1
	GL16-1-20160524	2016 05 24	7.84	803	-	-	-	3,470	-	-	< 5.0	250	-	145	1,020	1,770	938	938	< 1.0	< 1.0	-	< 1.0	-	-	< 20	-	0.0526
	GL16-1-20170525	2017 05 25	8.51	833	-	-	-	3,530	-	-	< 5.0	330	-	139	940	1,710	898	-	-	-	-	< 1.0	-	-	< 20	-	0.0517
	DUP2-20170525	Duplicate	8.45	847	-	-	-	3,510	-	-	< 5.0	280	-	142	990	1,750	866	-	-	-	-	< 1.0	-	-	< 20	-	0.0528
	QA/QC RPD%		1	2	-	-	-	1	-	-	*	16	-	2	5	2	4	-	-	-	-	*	-	-	*	-	2
	GL16-1-180604	2018 06 04	7.67	762	7.11	-	3,660	3,180	2.93	0.0072	27	< 5,000a	< 10	273	690	4,040	944	944	< 1.0	< 1.0	< 1.0	< 50.0	-	-	24	0.0072	-
	GL16-1-190529	2019 05 29	7.83	756	7.03	-	4453	3,390	3.06	< 0.0500	68	< 100	< 100	133	1,240	1,480	965	965	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	< 0.0500	-
	GL16-1-200608	2020 06 08	7.98	699	7.08	-	3,720	3,020	1.59	-	256	< 1,000	< 1,000a	95.1	< 10,000a	1,270	973	973	< 1.0	< 1.0	< 1.0	< 10.0	-	-	< 20	-	< 0.500
	GL16-1-210609	2021 06 09	7.98	658	7.01	-	4,173	2,670	2.15	-	124	< 100	< 100	113	< 1,000	1,110	978	978	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0500
GL17-1	GL17-1-20091112	2009 11 12	-	3,390	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GL17-1-20100811	2010 08 11	-	3,280	-	-	-	9,080	-	-	50	-	-	172	-	4,600	678	-	-	-	-	-	-	-	30	-	0.003
	GL30-4-20100811	Duplicate	-	3,170	-	-	-	8,730	-	-	70	-	-	174	-	4,710	679	-	-	-	-	-	-	-	40	-	0.003
	QA/QC RPD%		-	3	-	-	-	4	-	-	33	-	-	1	-	2	0	-	-	-	-	-	-	-	*	-	*
	GL17-1-20110628	2011 06 28	-	3,580	-	-	-	8,930	-	-	180	-	-	164	-	5,060	664	-	-	-	-	-	-	-	40	-	0.088
	GL17-1-20120625	2012 06 25	-	130	-	-	-	1,610	-	-	340	-	-	71.5	-	6.7	1,480	-	-	-	-	-	-	-	20	-	0.034
	GL17-1-20121204	2012 12 04	-	98	-	-	-	1,570	-	-	360	< 100	-	72.6	-	6.3	614	-	-	-	-	-	-	-	33	-	0.031
	GL17-1-20160526	2016 05 26	8.18	118	-	-	-	1,480	-	-	371	< 100	-	71	2,040	< 6.0	1,330	-	-	-	-	< 1.0	-	-	< 20	-	0.0152
	GL17-1-20160919	2016 09 19	8.32	123	-	-	-	1,490	-	-	184	< 100	-	93	1,930	29.3	1,240	-	-	-	-	< 1.0	-	-	< 20	-	0.053
	GL17-1-20170531	2017 05 31	8.13	125	-	-	-	1,530	-	-	353	< 100	-	78	1,890	< 6.0	1,350	-	-	-	-	< 1.0	-	-	< 20	-	0.0146
	GL17-1-20170926	2017 09 26	7.95	121	-	-	-	1,480	-	-	334	< 100	-	81	1,950	7.6	1,310	-	-	-	-	< 1.0	-	-	< 20	-	0.0114
	GL17-1-180604	2018 06 04	7.83	127	7.3	-	2,044	1,480	2.54	< 0.0050	373	< 10	< 10	68.9	1,710	18.3	1,330	1,330	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	< 0.0050	-
	GL17-1-180919	2018 09 19	7.80	130	7.5	-	2,197	1,480	2.83	< 0.0050	287	< 100	< 10	88.4	2,060	45.7	1,220	1,220	< 1.0	< 1.0	< 1.0	0.40	-	-	< 20	< 0.0050	-

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GL17-1 (cont'd)	GL17-1-190527	2019 05 27	8.11	124	7.56	-	2558	1,490	2.02	< 0.0050	445	< 10	< 10	75.7	1,960	14.4	1,380	1,380	< 1.0	< 1.0	< 1.0	0.18	-	-	-	< 20	< 0.0050	-	
	DUP1-190527	Duplicate	8.13	120	7.56	-	2558	1,470	1.76	< 0.0050	481	< 10	< 10	75.5	1,940	13.8	1,400	1,400	< 1.0	< 1.0	< 1.0	0.20	-	-	-	< 20	< 0.0050	-	
	QA/QC RPD%		0	3	*	-	*	1	-	*	8	-	-	0	1	4	1	1	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	
	GL17-1-190923	2019 09 23	8.11	128	7.67	-	2421	1,550	1.92	-	351	< 10	< 10	78.7	1,940	14.3	1,360	1,360	< 1.0	< 1.0	< 1.0	0.42	-	-	-	< 20	-	0.0715	
	GL17-1-200608	2020 06 08	8.20	121	7.35	-	2,138	1,590	2.32	-	349	< 10	< 10	62.6	1,820	3.9	1,400	1,400	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	0.0500	
	GL17-1-201020	2020 10 20	8.01	132	7.43	-	2,457	1,530	2.22	-	402	< 10	< 10	69.6	1,990	4.4	1,300	1,300	< 1.0	< 1.0	< 1.0	0.33	-	-	-	< 20	-	0.0103	
	GL17-1-210604	2021 06 04	8.14	135	-	-	-	1,220	1.36	-	315	< 10	< 10	71.0	2,030	3.9	1,410	1,410	< 1.0	< 1.0	< 1.0	0.34	-	-	-	< 20	-	< 0.0050	
	GL17-1-211006	2021 10 06	7.98	127	7.33	-	2,153	1,660	1.24	-	399	< 10	< 10	64.2	1,970	< 10.0	1,460	1,460	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0050	
	GL17-2-20091112	2009 11 12	-	128	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL30-2-20091112	Duplicate	-	119	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GL17-2	QA/QC RPD%		-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL17-2-20100811	2010 08 11	-	110	-	-	-	1,630	-	-	350	-	-	65.2	-	6.2	1,480	-	-	-	-	-	-	-	10	-	0.058		
	GL17-2-20110628	2011 06 28	-	109	-	-	-	1,510	-	-	220	-	-	68	-	60	135	-	-	-	-	-	-	-	10	-	0.109		
	GL17-2-20120625	2012 06 25	-	3,440	-	-	-	9,700	-	-	190	-	-	204	-	5,740	606	-	-	-	-	-	-	-	40	-	< 0.002		
	GL17-2-20121204	2012 12 04	-	3,920	-	-	-	10,000	-	-	110	2,500	-	180	-	6,120	652	-	-	-	-	-	-	-	33	-	< 0.002		
	GL17-2-20130626	2013 06 26	-	4,000	-	-	-	10,800	-	-	< 5.0	2,610	-	191	2,300	6,330	780	-	-	-	-	< 2.5	-	-	33	-	-		
	GL17-2-20131113	2013 11 13	-	4,190	-	-	-	10,800	-	-	22.6	1,840	-	262	1,700	6,380	864	-	-	-	-	-	-	-	24	-	-		
	GL17-2-20140605	2014 06 05	-	3,650	-	-	-	10,500	-	-	32.4	1,490	-	226	1,300	6,290	822	-	-	-	-	< 2.5	-	-	29	-	0.0025		
	GL17-2-20141118	2014 11 18	-	3,860	-	-	-	11,300	-	-	47	1,330	-	247	1,400	6,820	966	-	-	-	-	< 2.5	-	-	40	-	0.0014		
	GL17-2-20150608	2015 06 08	7.5	4,010	-	-	-	10,300	-	-	33.2	1,680	-	241	1,700	6,660	870	-	-	-	-	< 2.5	-	-	32	-	0.0025		
	GL17-2-20151104	2015 11 04	7.65	3,760	-	-	-	11,100	-	-	9.3	1,970	-	257	1,700	7,000	705	-	-	-	-	< 2.5	-	-	26	-	0.0033		
	GL 18-2-20091110	2009 11 10	-	1,060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	GL18-2-20100811	2010 08 11	-	1,380	-	-	-	6,930	-	-	1,400	-	-	568	-	3,800	154	-	-	-	-	-	-	-	40	-	0.005		
	GL18-2-20110629	2011 06 29	-	1,510	-	-	-	6,440	-	-	710	-	-	572	-	3,770	260	-	-	-	-	-	-	-	40	-	0.078		
	GL18-2-20120626	2012 06 26	-	1,480	-	-	-	6,820	-	-	1,020	-	-	572	-	3,620	156	-	-	-	-	-	-	-	40	-	0.004		
	DUP-A-20120626	Duplicate	-	1,520	-	-	-	6,670	-	-	1,280	-	-	585	-	3,670	167	-	-	-	-	-	-	-	60	-	0.004		
	QA/QC RPD%		-	3	-	-	-	2	-	-	23	-	-	2	-	1	7	-	-	-	-	-	-	-	-	-	-		
	GL18-2-20121205	2012 12 05	-	1,380	-	-	-	6,600	-	-	1,450	< 10,000a	-	785	-	8,090	165	-	-	-	-	-	-	-	22	-	0.005		
	GL18-2-20130627	2013 06 27	-	1,400	-	-	-	6,660	-	-	1,330	< 250	-	611	< 1,000	3,900	177	-	-	-	-	3.7	-	-	47	-	-		
	GL18-2-20131114	2013 11 14	-	1,380	-	-	-	6,670	-	-	1,370	< 250	-	618	< 1,000	3,870	181	-	-	-	-	3.7	-	-	32	-	-		
	GL18-2-20140609	2014 06 09	-	1,380	-	-	-	6,260	-	-	1,440	< 250	-	608	< 1,000	3,820	180	-	-	-	-	3.4	-	-	150	-	0.0043		
	GL18-2-20141126	2014 11 26	-	1,380	-	-	-	6,330	-	-	1,370	760	-	613	< 1,000	3,780	680	-	-	-	-	3.5	-	-	38	-	0.0042		
	DUP3-20141126	Duplicate	-	1,390	-	-	-	6,080	-	-	1,440	420	-	627	< 1,000	3,860	170	-	-	-	-	3.8	-	-	40	-	0.0033		
	QA/QC RPD%		-	1	-	-	-	4	-	-	5	58	-	2	-	2	120	-	-	-	-	8	-	-	*	-	*		
	GL18-2-20150615	2015 06 15	7.98	1,340	-	-	-	6,410	-	-	1,330	< 250	-	608	< 1,000	3,780	170	-	-	-	-	3.7	-	-	35	-	0.0043		
	GL18-2-20170529	2017 05 29	7.95	1,370	-	-	-	6,310	-	-	1,390	< 250	-	619	< 1,000	3,820	141	-	-	-	-	3.2	-	-	< 20	-	0.0027		
	GL18-2-180604	2018 06 04	7.38	1,410	7.797.8	8,140	7,172	6,140	2.92	0.0231	1,520	< 5,000a	< 10	1,130	230	8,810	138	138	< 1.0	< 1.0	< 1.0	< 50.0	< 0.01a	< 0.020	38	0.0231	-		
	DUP-180604	Duplicate	7.43	1,430	7.79	-	7,172	6,310	2.91	0.0216	1,530	< 5,000a	< 10	1,130	250	8,740	139	139	< 1.0	< 1.0	< 1.0	< 50.0	-	-	36	0.0216	-		
	QA/QC RPD%		1	1	*	-	*	3	0	*	1	*	*	0	*	1	1	1	*	*	*	*	-	-	*	*	-	-	

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.

All terms defined within the body of Keltech's report.
< Denotes concentration less than indicated detection limit or RPD less than indicated value.
- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.
QA/QC RPD Denotes quality assurance/quality control relative percent difference
* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics													
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate			
GL20-1	GL20-1-20091112	2009 11 12	-	998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	GL20-1-20100811	2010 08 11	-	997	-	-	-	6,910	-	-	13,000	-	-	868	-	33	5,940	-	-	-	-	-	-	-	1,500	-	0.36			
	GL20-1-20110629	2011 06 29	-	113	-	-	-	6,900	-	-	317,000	-	-	880	-	600	582	-	-	-	-	-	-	-	110	-	3.8			
	GL20-1-20111217	2011 12 17	-	997	-	-	-	7,110	-	-	354,000	< 200	-	986	-	< 3	5,820	-	-	-	-	-	-	-	1,500	-	0.49			
	DUPA-20111217	Duplicate	-	988	-	-	-	7,140	-	-	364,000	< 200	-	982	-	< 3	5,810	-	-	-	-	-	-	-	1,400	-	0.64			
	QA/QC RPD%		-	1	-	-	-	0	-	-	3	*	-	0	-	*	0	-	-	-	-	-	-	-	7	-	27			
	GL20-1-20120625	2012 06 25	-	1,030	-	-	-	6,820	-	-	288,000	-	-	885	-	25.3	5,670	-	-	-	-	-	-	-	1,300	-	0.52			
	GL20-1-20121203	2012 12 03	-	872	-	-	-	7,070	-	-	485,000	< 1,000	-	923	-	< 50	5,900	-	-	-	-	-	-	-	1,280	-	15.7			
	GL20-1-20130625	2013 06 25	-	1,130	-	-	-	8,490	-	-	273,000	< 250	-	865	1,600	294	6,320	-	-	-	-	6.9	-	-	1,180	-	-			
	GL20-1-20140605	2014 06 05	-	907	-	-	-	7,650	-	-	96,100	123,000	-	586	< 1,000	1,250	3,850	-	-	-	-	5.3	-	-	566	-	0.791			
	DUP4-20140605	Duplicate	-	897	-	-	-	7,590	-	-	95,300	129,000	-	572	< 1,000	1,230	3,940	-	-	-	-	5.5	-	-	572	-	0.711			
	QA/QC RPD%		-	1	-	-	-	1	-	-	1	5	-	2	*	2	2	-	-	-	-	4	-	-	1	-	11			
	GL20-1-20141126	2014 11 26	-	945	-	-	-	7,430	-	-	180,000	< 250	-	819	< 1,000	21	6,130	-	-	-	-	6.8	-	-	923	-	6.4			
	GL20-1-20150611	2015 06 11	7.84	848	-	-	-	7,590	-	-	110,000	27,200	-	724	< 1,000	754	5,200	-	-	-	-	5.7	-	-	655	-	0.66			
	GL20-1-200826	2020 08 26	7.73	118	6.99	-	8514	5,240	122	-	140,000	< 100	< 100	506	< 1,000	86.3	4,460	4,460	< 1.0	< 1.0	< 1.0	< 1.00	-	-	422	-	2.39			
	GL20-1-201020	2020 10 20	7.50	565	7	-	8,684	5,230	< 0.50	-	116,000	< 100	< 100	493	< 1,000	32.6	4,240	4,240	< 1.0	< 1.0	< 1.0	< 1.00	-	-	429	-	2.48			
	GL20-1-210511	2021 05 11	7.72	686	7.04	-	8,487	5,750	0.81	-	94,500	< 100	< 100	467	< 1,000	132	4,520	4,520	< 1.0	< 1.0	< 1.0	< 1.00	-	-	423	-	< 0.0500			
	GL20-1-210924	2021 09 24	7.60	565	6.90	-	8,332	5,520	118	-	111,000	582	50	463	320	14.7	4,740	4,740	< 1.0	< 1.0	< 1.0	2.62	-	-	445	-	0.0835			
	DUP 2-210924	Duplicate	7.63	551	6.90	-	8,332	5,660	132	-	102,000	594	45	462	350	14.9	4,790	4,790	< 1.0	< 1.0	< 1.0	2.66	-	-	432	-	0.0863			
	QA/QC RPD%		0	3	0	-	0	3	11	-	8	2	*	0	*	1	1	1	*	*	*	2	-	-	3	-	3			
GL21-1	GL21-1-20091117	2009 11 17	-	4,230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	GL21-1-20110705	2011 07 05	-	520	-	-	-	14,200	-	-	-	-	-	19	-	170	1,230	-	-	-	-	-	-	-	-	-	0.07			
	GL 21-1-20110707	2011 07 07	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140	-	-			
	GL21-1-20120625	2012 06 25	-	4,660	-	-	-	14,800	-	-	< 10	-	-	697	-	8,380	1,120	-	-	-	-	-	-	-	110	-	0.052			
	GL21-1-20121204	2012 12 04	-	4,300	-	-	-	14,600	-	-	90	1,880	-	628	-	7,910	1,160	-	-	-	-	-	-	-	125	-	0.042			
GL22-1	GL 22-1-20091110	2009 11 10	-	1,050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	GL22-1-20100811	2010 08 11	-	970	-	-	-	1,450	-	-	70	-	-	25.6	-	338	961	-	-	-	-	-	-	-	60	-	0.01			
GL23-1	GL 23-1-20091110	2009 11 10	-	1,140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	GL23-1-20100811	2010 08 11	-	1,000	-	-	-	1,640	-	-	40	-	-	30.9	-	352	1,220	-	-	-	-	-	-	-	50	-	0.005			
	GL23-1-20110704	2011 07 04	-	1,160	-	-	-	1,720	-	-	40	-	-	31.9	-	467	1,170	-	-	-	-	-	-	-	160	-	0.008			
	GL 23-1-20120627	2012 06 27	-	1,100	-	-	-	1,780	-	-	< 10	-	-	32.9	-	497	1,160	-	-	-	-	-	-	-	40	-	0.008			
	GL23-1-20121203	2012 12 03	-	270	-	-	-	1,790	-	-	80	< 100	-	33.8	-	500	1,080	-	-	-	-	-	-	-	44	-	0.009			
	GL23-1-20130627	2013 06 27	-	1,170	-	-	-	1,750	-	-	< 5.0	110	-	35	1,650	544	1,180	-	-	-	-	< 1.0	-	-	30	-	-			
	GL23-1-20140603	2014 06 03	-	1,080	-	-	-	1,710	-	-	11.6	160	-	41	1,170	522	1,130	-	-	-	-	< 1.0	-	-	38	-	0.0065			
	GL23-1-20141124	2014 11 24	-	1,210	-	-	-	1,790	-	-	26.9	< 100	-	37	1,210	624	1,100	-	-	-	-	< 1.0	-	-	48	-	0.0054			
	GL23-1-20150608	2015 06 08	7.67	1,130	-	-	-	1,700	-	-	< 5.0	< 100	-	36	1,090	500	1,200	-	-	-	-	< 1.0	-	-	41	-	0.0059			
	GL23-1-20151104	2015 11 04	7.68	1,050	-	-	-	1,570	-	-	17.2	< 100	-	33	940	390	1,130	-	-	-	-	< 1.0	-	-	37	-	0.0048			
	GL23-1-20160526	2016 05 26	7.99	1,080	-	-	-	1,570	-	-	< 5.0	< 100	-	34	1,030	382	1,090	-	-	-	-	< 1.0	-	-	38	-	0.003			
	GL23-1-20160531	2016 05 31	7.64	-	-	-	-	1,580	-	-	< 20	66	-	30.6	1,050	384	1,090	-	-	-	-	-	-	-	-	-	< 0.01			
	GL23-1-20170525	2017 05 25	8.45	1,150	-	-	-	1,610	-	-	10.4	< 100	-	35	890	386	1,070	-	-	-	-	< 1.0	-	-	42	-	0.0034			
	DUP3-20170525	Duplicate	8.41	1,150	-	-	-	1,580	-	-	< 5.0	< 100	-	35	900	387	1,020	-	-	-	-	< 1.0	-	-	37	-	0.0033			
	QA/QC RPD%		0	0	-	-	-	2	-	-	*	*	-	0	1	0	5	-	-	-	-	*	-	-	*	-	*			

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Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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- Denotes analysis not conducted.
n/a Denotes no applicable standard/guideline.
QA/QC RPD Denotes quality assurance/quality control relative percent difference
* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics													
			pH	Total Hardness mg/L	pH (field)	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Ammonia, Total (as N) µg/L	Nitrate (as N) µg/L	Nitrite (as N) µg/L	Chloride mg/L	Fluoride µg/L	Sulfate mg/L	Total Alkalinity mg/L	Alkalinity, Bicarbonate (as CaCO3) mg/L	Alkalinity, Carbonate (as CaCO3) mg/L	Alkalinity, Hydroxide (as CaCO3) mg/L	Alkalinity, Phenolphthalein (as CaCO3) mg/L	Bromide mg/L	Hydrogen Sulfide mg/L	Sulfide mg/L	Chemical Oxygen Demand mg/L	Dissolved Phosphate mg/L	Ortho-Phosphate mg/L			
GL23-1 (cont'd)	GL23-1-180529	2018 05 29	7.86	1,260	7.22	-	2,014	1,560	14.3	0.0062	36	< 10	66	34.2	710	341	1,090	1,090	< 1.0	< 1.0	< 1.0	0.27	-	-	39	0.0062	-			
	GL23-1-190523	2019 05 23	8.01	1,170	7.7	-	2332	1,590	14.8	< 0.0050	33	72	< 10	34.0	660	384	1,120	1,120	< 1.0	< 1.0	< 1.0	0.27	-	-	30	< 0.0050	-			
	GL23-1-190917	2019 09 17	7.78	1,130	-	-	-	1,610	16.4	-	60	< 10	< 10	35.0	750	394	1,090	1,090	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	-	< 0.0050			
	GL23-1-200617	2020 06 17	7.97	1,000	6.95	-	2,150	1,530	14.6	-	< 50	134	< 100	32.3	< 1,000	405	964	964	< 1.0	< 1.0	< 1.0	< 1.00	-	-	33	-	< 0.0500			
	GL23-1-200910	2020 09 10	7.98	1,130	-	-	-	1,660	14.8	-	< 50	28	< 10	33.1	780	402	1,110	1,110	< 1.0	< 1.0	< 1.0	0.32	-	-	-	-	< 0.0050			
	GL23-1-210513	2021 05 13	7.85	1,080	7.06	-	2,319	1,370	13.9	-	< 50	10	< 10	33.2	760	376	1,180	1,180	< 1.0	< 1.0	< 1.0	0.33	-	-	22	-	< 0.0050			
	DUP 1-210513	Duplicate	7.73	1,090	7.06	-	2,319	1,490	14.7	-	< 50	< 10	< 10	34.4	720	356	1,170	1,170	< 1.0	< 1.0	< 1.0	0.30	-	-	43	-	< 0.0050			
	QA/QC RPD%		2	1	0	-	0	8	6	-	*	*	*	4	5	5	1	1	*	*	*	*	-	-	*	-	*			
GL24-1	GL24-1-20100811	2010 08 11	-	1,200	-	-	-	2,110	-	-	< 10	-	-	91.4	-	762	852	-	-	-	-	-	-	-	20	-	0.034			
	GL24-1-20160531	2016 05 31	7.64	-	-	-	-	1,570	-	-	< 20	11,700	-	188	1,270	349	778	-	-	-	-	-	-	-	-	-	0.1			
	GL24-1-20180927	2018 09 27	-	1,760	-	-	-	-	-	-	31	61,600	-	99.1	1,140	1,450	-	-	-	-	-	< 0.10	-	-	-	-	< 0.0050			
	GL24-1-180612	2018 06 12	7.63	1,300	-	-	-	2,380	-	0.0083	60	13,100	29	216	1,090	742	1,060	1,060	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	0.0083	-			
	GL24-1-190917	2019 09 17	7.92	1,100	-	-	-	1,870	9.09	-	47	6,540	< 100	163	1,200	591	921	921	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	-	< 0.0500			
	GL24-1-200910	2020 09 10	8.04	856	-	-	-	1,750	6.56	-	< 50	1,690	< 10	123	1,390	418	930	930	< 1.0	< 1.0	< 1.0	0.30	-	-	-	-	< 0.0050			
GL25-1	GL25-1-20091117	2009 11 17	-	1,540	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	GL25-1-20100812	2010 08 12	-	1,480	-	-	-	2,630	-	-	< 10	-	-	67	-	1,350	455	-	-	-	-	-	-	60	-	0.016				
GL26-1	GL26-1-20091112	2009 11 12	-	654	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	GL26-1-20100812	2010 08 12	-	527	-	-	-	1,230	-	-	30	-	-	8.9	-	309	706	-	-	-	-	-	-	10	-	0.005				
	GL30-5-20100812	Duplicate	-	575	-	-	-	1,250	-	-	50	-	-	8.8	-	306	705	-	-	-	-	-	-	10	-	0.005				
GL26-2	QA/QC RPD%		-	9	-	-	-	2	-	-	50	-	-	1	-	1	0	-	-	-	-	-	-	*	-	0				
	GL26-2-20091116	2009 11 16	-	629	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	GL26-2-20100812	2010 08 12	-	491	-	-	-	1,210	-	-	< 10	-	-	15.5	-	346	655	-	-	-	-	-	-	20	-	0.013				
	GL26-2-20110629	2011 06 29	-	634	-	-	-	1,160	-	-	< 10	-	-	14.8	-	357	644	-	-	-	-	-	-	< 10	-	0.108				
	GL26-2-20120625	2012 06 25	-	670	-	-	-	1,210	-	-	30	-	-	18.3	-	367	644	-	-	-	-	-	-	20	-	0.006				
	GL26-2-20121204	2012 12 04	-	572	-	-	-	1,200	-	-	100	< 100	-	14.9	-	357	643	-	-	-	-	-	-	23	-	< 0.002				
	GL26-2-20130626	2013 06 26	-	673	-	-	-	1,170	-	-	62.7	120	-	15	1,380	410	666	-	-	-	< 1.0	-	-	< 20	-	-				
	GL26-2-20131114	2013 11 14	-	639	-	-	-	1,160	-	-	68.3	< 50	-	19.3	1,320	417	818	-	-	-	< 0.50	-	-	< 20	-	-				
	GL26-2-20140605	2014 06 05	-	665	-	-	-	1,130	-	-	52	< 50	-	14.3	1,170	400	782	-	-	-	< 0.50	-	-	< 20	-	0.0021				
	DUP2-20140605	Duplicate	-	668	-	-	-	1,130	-	-	58.7	< 50	-	14.2	1,170	396	816	-	-	-	< 0.50	-	-	< 20	-	0.0014				
	QA/QC RPD%		-	0	-	-	-	0	-	-	12	*	-	1	0	1	4	-	-	-	-	*	-	*	-	*				
	GL26-2-20141117	2014 11 17	-	638	-	-	-	1,120	-	-	50.8	< 100	-	20	1,160	403	830	-	-	-	-	< 1.0	-	-	< 20	-	0.0023			
	GL26-2-20150608	2015 06 08	7.58	643	-	-	-	1,120	-	-	80.2	99	-	19.1	1,170	406	735	-	-	-	< 0.50	-	-	< 20	-	0.0096				
GL26-3	GL26-2-20151104	2015 11 04	7.73	617	-	-	-	1,170	-	-	62.4	< 50	-	13.6	1,170	388	613	-	-	-	< 0.50	-	-	< 20	-	< 0.0010				
	GL26-3-20091111	2009 11 11	-	682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	GL26-3-20100812	2010 08 12	-	538	-	-	-	1,500	-	-	< 10	-	-	62	-	499	604	-	-	-	-	-	-	20	-	0.03				

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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n/a Denotes no applicable standard/guideline.
QA/QC RPD Denotes quality assurance/quality control relative percent difference
* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters													Dissolved Inorganics												
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate	
GL27-1	GL27-1-20091116	2009 11 16	-	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GL27-1-20100812	2010 08 12	-	67	-	-	-	1,650	-	-	210	-	-	68	-	57	1,580	-	-	-	-	-	-	-	10	-	0.041	
	GL27-1-20110629	2011 06 29	-	88	-	-	-	1,600	-	-	70	-	-	44	-	70	161	-	-	-	-	-	-	-	< 10	-	0.165	
	GL 27-1-20120626	2012 06 26	-	94	-	-	-	1,660	-	-	70	-	-	36.5	-	8	1,600	-	-	-	-	-	-	-	20	-	-	
	GL 27-1-20120704	2012 07 04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.121	
	GL27-1-20121204	2012 12 04	-	73	-	-	-	1,670	-	-	100	< 100	-	39.8	-	6.3	1,570	-	-	-	-	-	-	-	18	-	0.128	
	GL27-1-20130626	2013 06 26	-	88.4	-	-	-	1,730	-	-	126	< 100	-	37	3,540	< 10	1,550	-	-	-	-	< 1.0	-	-	< 20	-	-	
	GL27-1-20131113	2013 11 13	-	93.5	-	-	-	1,630	-	-	107	< 100	-	41	3,400	< 10	1,500	-	-	-	-	-	-	-	< 20	-	-	
	GL27-1-20140605	2014 06 05	-	94.4	-	-	-	1,630	-	-	126	< 100	-	38	3,420	< 10	1,560	-	-	-	-	< 1.0	-	-	< 20	-	0.12	
	GL27-1-20141118	2014 11 18	-	86.8	-	-	-	1,640	-	-	171	< 100	-	39	3,280	< 10	1,640	-	-	-	-	< 1.0	-	-	38	-	0.115	
	GL27-1-20150610	2015 06 10	8.41	87.1	-	-	-	1,470	-	-	122	< 100	-	38	3,250	< 6.0	1,590	-	-	-	-	< 1.0	-	-	< 20	-	0.102	
	GL27-1-20151104	2015 11 04	8.18	86.6	-	-	-	1,610	-	-	180	< 100	-	36	3,080	< 6.0	1,500	-	-	-	-	< 1.0	-	-	< 20	-	0.0954	
	GL27-1-20160526	2016 05 26	8.27	91.8	-	-	-	1,620	-	-	116	< 100	-	38	3,450	< 6.0	1,500	-	-	-	-	< 1.0	-	-	< 20	-	0.0886	
	DUP-1-20160526	Duplicate	8.31	85.7	-	-	-	1,690	-	-	111	< 100	-	38	3,490	< 6.0	1,480	-	-	-	-	< 1.0	-	-	< 20	-	0.0902	
	QA/QC RPD%			0	7	-	-	-	4	-	-	4	*	-	0	1	*	1	-	-	-	-	*	-	-	*	-	2
	GL27-1-20160919	2016 09 19	8.34	90.8	-	-	-	1,630	-	-	152	< 100	-	36	3,000	< 6.0	1,530	-	-	-	-	< 1.0	-	-	< 20	-	0.112	
	GL27-1-20170525	2017 05 25	8.83	95.2	-	-	-	1,640	-	-	70.1	< 100	-	38	3,310	6	1,560	-	-	-	-	< 1.0	-	-	< 20	-	0.0674	
	GL27-1-20170925	2017 09 25	8.14	92	-	-	-	1,650	-	-	155	< 100	-	32	3,260	6.6	1,450	-	-	-	-	< 1.0	-	-	< 20	-	0.0553	
	GL27-1-180815	2018 08 15	7.98	89.6	7.63	-	1,870	1,680	2.57	0.0407	276	18	< 10	33.6	3,100	27.5	1,500	1,500	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	0.0407	-	
	GL27-1-180919	2018 09 19	7.91	99.9	7.62	-	2,388	1,620	3.45	0.0445	220	< 10	< 10	35.1	3,210	19.2	1,450	1,450	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	0.0445	-	
	GL27-1-190527	2019 05 27	8.20	90.6	7.67	-	2620	1,430	2.89	0.0794	272	< 10	< 10	36.2	3,020	21.8	1,480	1,480	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	0.0794	-	
	GL27-1-190919	2019 09 19	8.22	92.8	7.48	-	2471	1,610	2.84	-	242	< 10	< 10	35.6	3,290	19.9	1,490	1,490	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	0.0424	
	GL27-1-200608	2020 06 08	8.31	93.2	7.5	-	2,216	1,530	2.12	-	230	< 10	< 10	35.5	3,060	17.0	1,500	1,480	22.6	< 1.0	11.3	< 0.10	-	-	< 20	-	< 0.0050	
	GL27-1-201022	2020 10 22	8.10	85.2	7.63	-	2,525	1,600	2.79	-	243	< 10	< 10	37.7	3,330	7.8	1,420	1,420	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	0.0567	
	GL27-1-210602	2021 06 02	8.16	103	7.47	-	2,633	1,260	2.04	-	186	< 10	< 10	36.8	3,190	11.7	1,510	1,510	< 1.0	< 1.0	< 1.0	0.16	-	-	< 20	-	0.0558	
	GL27-1-210924	2021 09 24	8.21	107	7.47	-	2,544	1,810	106	-	318	< 10	< 10	36.7	3,320	11.8	1,550	1,550	< 1.0	< 1.0	< 1.0	0.12	-	-	< 20	-	0.0391	
GL27-2	GL27-1-20111217	2011 12 17	-	83	-	-	-	1,630	-	-	80	< 50	-	40.1	-	20.4	1,500	-	-	-	-	-	-	-	10	-	0.08	
	GL27-2-20091116	2009 11 16	-	3,760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL27-2-20100812	2010 08 12	-	3,540	-	-	-	14,300	-	-	290	-	-	740	-	6,590	708	-	-	-	-	-	-	130	-	0.057		
GL27-3	GL27-3-20091112	2009 11 12	-	5,800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL27-3-20100812	2010 08 12	-	4,700	-	-	-	17,800	-	-	500	-	-	800	-	8,490	645	-	-	-	-	-	-	60	-	0.007		
	GL27-3-20110629	2011 06 29	-	5,170	-	-	-	16,700	-	-	470	-	-	610	-	9,700	639	-	-	-	-	-	-	30	-	0.268		
	GL27-3-20111217	2011 12 17	-	4,500	-	-	-	17,100	-	-	410	< 200	-	582	-	10,900	653	-	-	-	-	-	-	40	-	0.04		
	GL27-3-20120625	2012 06 25	-	5,060	-	-	-	16,400	-	-	520	-	-	543	-	9,620	638	-	-	-	-	-	-	70	-	0.003		
	GL27-3-20121204	2012 12 04	-	4,480	-	-	-	15,900	-	-	660	< 1,000	-	502	-	9,230	626	-	-	-	-	-	-	62	-	0.002		
	GL27-3-20130626	2013 06 26	-	5,280	-	-	-	17,200	-	-	730	< 500	-	589	1,300	11,100	864	-	-	-	-	< 5.0	-	53	-	-		
	GL27-3-20131113	2013 11 13	-	4,890	-	-	-	16,200	-	-	552	< 500	-	577	1,390	9,840	876	-	-	-	-	-	-	31	-	-		
	GL27-3-20140605	2014 06 05	-	5,120	-	-	-	16,300	-	-	564	< 250	-	586	< 1,000	10,600	967	-	-	-	-	4	-	-	47	-	0.0024	
GL27-3-20141118	2014 11 18	-	4,560	-	-	-	13,300	-	-	416	< 500	-	545	1,200	9,930	947	-	-	-	-	< 5.0	-	-	38	-	0.0055		

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* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters															Dissolved Inorganics														
			pH	Total Hardness mg/L	pH (field)	Conductivity μS/cm	Field Conductivity μS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Ammonia, Total (as N) μg/L	Nitrate (as N) μg/L	Nitrite (as N) μg/L	Chloride mg/L	Fluoride μg/L	Sulfate mg/L	Total Alkalinity mg/L	Alkalinity, Bicarbonate (as CaCO3) mg/L	Alkalinity, Carbonate (as CaCO3) mg/L	Alkalinity, Hydroxide (as CaCO3) mg/L	Alkalinity, Phenolphthalein (as CaCO3) mg/L	Bromide mg/L	Hydrogen Sulfide mg/L	Sulfide mg/L	Chemical Oxygen Demand mg/L	Dissolved Phosphate mg/L	Ortho-Phosphate mg/L					
GL27-3 (cont'd)	GL27-3-20150610	2015 06 10	8.07	4,990	-	-	-	17,900	-	-	615	< 500	-	600	< 2,000a	11,100	840	-	-	-	-	< 5.0	-	-	-	44	-	0.0015				
	GL27-3-20151104	2015 11 04	7.88	4,380	-	-	-	16,000	-	-	487	< 500	-	557	< 2,000a	10,400	624	-	-	-	-	< 5.0	-	-	-	33	-	0.0043				
	GL27-3-20160524	2016 05 24	7.85	4,850	-	-	-	16,200	-	-	582	< 500	-	620	< 2,000a	11,400	604	604	< 1.0	< 1.0	-	< 5.0	-	-	-	27	-	0.0025				
	GL27-3-20170925	2017 09 25	7.82	5,080	-	-	-	15,200	-	-	600	< 500	-	543	< 2,000a	10,500	601	-	-	-	-	< 5.0	-	-	-	31	-	0.0027				
	GL27-3-180815	2018 08 15	7.71	5,450	7.91	-	9,589	18,000	9.12	< 0.500	589	< 1,000	< 1,000a	516	970	10,200	622	622	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	< 20	< 0.500	-				
	GL27-3-190527	2019 05 27	7.90	5,350	7.45	-	16199	13,500	7.11	< 0.500	57	1,470	< 1,000a	475	< 10,000a	9,330	610	610	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	< 20	< 0.500	-				
	GL27-3-200608	2020 06 08	7.88	5,540	7.3	-	15,172	18,200	6.30	-	806	6,600	< 5,000a	442	< 50,000a	10,400	586	586	< 1.0	< 1.0	< 1.0	< 50.0	-	-	-	21	-	< 2.50				
	GL27-3-210603	2021 06 03	7.95	6,070	7.38	-	17,777	19,800	8.09	-	823	< 2,500	< 2,500a	569	< 25,000a	11,400	571	571	< 1.0	< 1.0	< 1.0	< 25.0	-	-	-	21	-	< 1.25				
GL27-4	GL27-4-20100812	2010 08 12	-	4,380	-	-	-	13,400	-	-	14,000	-	-	780	-	4,900	3,370	-	-	-	-	-	-	-	360	-	4.76					
GL28-1	GL28-1-20091116	2009 11 16	-	1,680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	GL30-5-20091116	Duplicate	-	1,720	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	QA/QC RPD%		-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	GL28-1-20100812	2010 08 12	-	1,600	-	-	-	3,990	-	-	210	-	-	64	-	1,840	655	-	-	-	-	-	-	-	20	-	0.009					
	GL28-1-20110627	2011 06 27	-	944	-	-	-	3,060	-	-	< 10	-	-	27	-	1,700	346	-	-	-	-	-	-	-	10	-	0.009					
	GL28-1-20120626	2012 06 26	-	550	-	-	-	1,610	-	-	130	-	-	11.3	-	954	139	-	-	-	-	-	-	< 10	-	0.003						
	GL28-1-20121203	2012 12 03	-	1,680	-	-	-	3,870	-	-	220	< 100	-	38.7	-	2,240	649	-	-	-	-	-	-	-	18	-	< 0.002					
	DUP-A-20121203	Duplicate	-	1,700	-	-	-	3,830	-	-	170	< 100	-	39.4	-	2,240	647	-	-	-	-	-	-	-	33	-	< 0.002					
	QA/QC RPD%		-	1	-	-	-	1	-	-	26	*	-	2	-	0	0	-	-	-	-	-	-	-	*	-	*					
	GL28-1-20130708	2013 07 08	-	1,740	-	-	-	3,530	-	-	175	< 100	-	28	680	1,510	368	-	-	-	-	< 1.0	-	-	-	< 20	-	-				
	DUP1-20130708	Duplicate	-	1,740	-	-	-	4,220	-	-	178	< 100	-	34	890	1,890	619	-	-	-	-	< 1.0	-	-	-	< 20	-	-				
	QA/QC RPD%		-	0	-	-	-	18	-	-	2	*	-	19	27	22	51	-	-	-	-	*	-	-	*	-	-					
	GL28-1-20140603	2014 06 03	-	1,600	-	-	-	3,930	-	-	162	< 250	-	59	1,100	2,230	778	-	-	-	-	< 2.5	-	-	-	53	-	< 0.0010				
	GL28-1-20141117	2014 11 17	-	1,690	-	-	-	3,970	-	-	165	130	-	53	1,070	2,270	897	-	-	-	-	< 1.0	-	-	-	< 20	-	< 0.0010				
	GL28-1-20150611	2015 06 11	7.93	1,630	-	-	-	3,920	-	-	166	< 100	-	48	1,110	2,270	730	-	-	-	-	< 1.0	-	-	-	30	-	< 0.0010				
	GL28-1-20151105	2015 11 05	7.65	1,600	-	-	-	3,930	-	-	170	< 100	-	50	1,150	2,280	626	626	< 1.0	< 1.0	-	< 1.0	-	-	-	46	-	< 0.0010				
	GL28-1-20160524	2016 05 24	7.97	1,710	-	-	-	3,950	-	-	179	< 100	-	67	1,510	2,950	624	624	< 1.0	< 1.0	-	< 1.0	-	-	-	< 20	-	< 0.0010				
	GL28-1-20160920	2016 09 20	7.69	1,740	-	-	-	4,080	-	-	173	< 100	-	54	1,220	2,380	612	-	-	-	-	< 1.0	-	-	-	< 20	-	0.0014				
	GL28-1-20170711	2017 07 11	8.21	1,620	-	-	-	3,740	-	-	163	< 100	-	50	1,160	2,270	579	-	-	-	-	< 1.0	-	-	-	< 20	-	< 0.0010				
	GL28-1-20170926	2017 09 26	7.67	1,620	-	-	-	3,460	-	-	145	< 100	-	48	1,110	2,190	554	-	-	-	-	< 1.0	-	-	-	< 20	-	< 0.0010				
	GL28-1-180528	2018 05 28	7.72	1,710	6.99	-	3,741	3,730	4.85	< 0.0050	122	1,480	< 10	45.0	700	2,040	551	551	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	< 20	< 0.0050	-				
	GL28-1-180925	2018 09 25	7.72	1,750	7.21	-	3,761	3,770	4.88	< 0.0050	163	< 1,000	< 10	41.8	960	2,150	531	531	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	< 20	< 0.0050	-				
	DUP1-180925	Duplicate	7.73	1,730	7.21	-	3,761	3,930	4.81	< 0.0050	176	< 1,000	< 10	40.5	1,000	2,220	528	528	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	< 20	< 0.0050	-				
	QA/QC RPD%		0	1	*	-	*	4	1	*	8	*	*	3	4	3	1	1	*	*	*	*	*	-	-	*	*	-	-			
	GL28-1-190528	2019 05 28	7.81	1,690	7.12	-	3741	3,650	4.74	< 0.0500	236	< 100	< 100	38.3	1,100	2,060	531	531	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	< 0.0500	-				
	GL28-1-190919	2019 09 19	7.78	1,650	7.39	-	3802	3,470	4.47	-	98	< 100	< 100	40.6	1,010	2,010	521	521	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500				
	GL28-1-200610	2020 06 10	7.71	1,770	7.15	-	3,321	3,300	4.43	-	120	< 100	< 100	37.8	< 1,000	2,080	554	554	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500				
	DUPB-200610	Duplicate	7.75	1,630	7.15	-	3,321	3,680	3.83	-	124	< 100	< 100	38.1	< 1,000	2,140	544	544	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500				
	QA/QC RPD%		1	8	*	-	*	11	15	-	*	*	*	1	*	3	2	2	*	*	*	*	*	-	-	*	-	*	*			

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
All terms defined within the body of Keltech's report.
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- Denotes analysis not conducted.
n/a Denotes no applicable standard/guideline.
QA/QC RPD Denotes quality assurance/quality control relative percent difference
* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics													
			pH	Total Hardness mg/L	pH (field)	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Ammonia, Total (as N) µg/L	Nitrate (as N) µg/L	Nitrite (as N) µg/L	Chloride mg/L	Fluoride µg/L	Sulfate mg/L	Total Alkalinity mg/L	Alkalinity, Bicarbonate (as CaCO3) mg/L	Alkalinity, Carbonate (as CaCO3) mg/L	Alkalinity, Hydroxide (as CaCO3) mg/L	Alkalinity, Phenolphthalein (as CaCO3) mg/L	Bromide mg/L	Hydrogen Sulfide mg/L	Sulfide mg/L	Chemical Oxygen Demand mg/L	Dissolved Phosphate mg/L	Ortho-Phosphate mg/L			
GL28-1 (cont'd)	GL28-1-201104	2020 11 04	7.82	1,850	7.14	-	4,082	3,840	6.24	-	128	< 1,000	< 10	46.9	1,020	2,240	516	516	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	< 20	-	< 0.0050		
	DUP3-201104	Duplicate	7.80	1,850	-	-	-	3,450	6.09	-	127	< 1,000	< 10	46.3	1,000	2,190	515	515	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	< 20	-	< 0.0050		
	QA/QC RPD%		0	0	-	-	-	11	2	-	*	*	*	1	2	2	0	0	*	*	*	*	*	-	-	*	-	*		
	GL28-1-210609	2021 06 09	7.83	1,720	6.99	-	3,969	3,130	7.14	-	82	< 100	< 100	57.4	1,270	1,910	542	542	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	25	-	< 0.0500		
	GL28-1-211007	2021 10 07	7.80	1,860	7.04	-	3,843	3,550	8.00	-	119	< 100	< 100	65.4	< 1,000	1,940	550	550	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500		
	DUP 3-211007	Duplicate	7.78	1,840	7.04	-	3,843	3,620	8.06	-	124	< 100	< 100	63.3	< 1,000	1,930	549	549	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	26	-	< 0.0500		
	QA/QC RPD%		0	1	0	-	-	0	2	1	-	*	*	*	3	*	1	0	0	*	*	*	*	*	-	-	*	-	*	
GL28-2	GL28-2-20091116	2009 11 16	-	1,530	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	GL28-2-20160524	2016 05 24	7.72	1,840	-	-	-	4,530	-	-	5.1	11,200	-	46	< 1,000	2,870	696	696	< 1.0	< 1.0	-	< 2.5	-	-	-	< 20	-	0.0082		
	GL28-2-20160920	2016 09 20	7.5	1,810	-	-	-	4,760	-	-	< 5.0	12,100	-	49	< 1,000	2,760	693	-	-	-	< 2.5	-	-	-	< 20	-	0.0097			
	DUP1-20160920	Duplicate	7.51	3,610	-	-	-	4,750	-	-	< 5.0	12,000	-	48	< 1,000	2,740	693	-	-	-	< 2.5	-	-	-	< 20	-	0.0089			
	QA/QC RPD%		0	66	-	-	-	-	0	-	-	*	*	-	2	*	1	0	-	-	-	*	-	-	-	*	-	9		
	GL28-2-20170711	2017 07 11	8.03	1,680	-	-	-	4,400	-	-	< 5.0	13,100	-	47	< 400	2,590	671	-	-	-	-	< 1.0	-	-	-	< 20	-	0.0093		
	GL28-2-20170926	2017 09 26	7.48	1,920	-	-	-	4,640	-	-	< 5.0	12,100	-	50	< 400	2,840	670	-	-	-	-	< 1.0	-	-	-	< 20	-	0.0095		
	GL28-2-180528	2018 05 28	7.42	1,900	6.77	-	4,680	4,730	6.09	< 0.0050	24	8,440	< 10	44.0	110	2,690	686	686	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	< 20	< 0.0050	-		
	DUP1-180528	Duplicate	7.51	1,860	6.77	-	4,680	4,960	6.55	< 0.0050	27	8,560	< 1,000a	44.5	100	2,690	709	709	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	< 20	< 0.0050	-		
	QA/QC RPD%		1	2	*	-	*	5	7	*	*	1	*	1	*	0	3	3	*	*	*	*	*	-	-	*	*	*		
	GL28-2-180925	2018 09 25	7.60	2,280	6.97	-	5,093	5,370	8.34	< 0.0050	63	9,480	< 10	44.2	140	3,160	700	700	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	24	< 0.0050	-		
	GL28-2-190528	2019 05 28	7.70	2,170	6.97	-	5200	5,280	6.36	< 0.0500	24	11,600	< 100	48.6	< 1,000	2,830	723	723	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	< 0.0500	-		
	GL28-2-190919	2019 09 19	7.64	2,030	7.24	-	5225	5,380	5.96	-	48	10,600	< 100	51.7	< 1,000	2,790	700	700	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500		
	GL28-2-200610	2020 06 10	7.66	1,730	6.95	-	3,882	4,250	4.99	-	< 50	9,190	< 100	32.0	< 1,000	2,490	587	587	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500		
	GL28-2-201104	2020 11 04	7.70	2,200	6.9	-	5,499	4,790	6.26	-	< 50	9,400	< 10	42.9	130	3,020	677	677	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	< 20	-	< 0.0050		
	GL28-2-210609	2021 06 09	7.76	1,910	6.86	-	8,381	4,610	6.84	-	< 50	11,400	< 100	46.3	< 1,000	2,670	675	675	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	39	-	< 0.0500		
	GL28-2-211007	2021 10 07	7.66	2,460	6.84	-	5,591	5,450	6.29	-	< 50	10,000	< 100	53.0	< 1,000	3,050	728	728	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500		
GL28-3	GL28-3-20091116	2009 11 16	-	1,760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	GL28-3-20100812	2010 08 12	-	1,580	-	-	-	4,230	-	-	< 10	-	-	60	-	1,950	702	-	-	-	-	-	-	-	-	30	-	0.038		
	GL28-3-20160524	2016 05 24	7.52	2,740	-	-	-	6,310	-	-	< 5.0	2,380	-	48	< 1,000	4,070	782	782	< 1.0	< 1.0	-	< 2.5	-	-	-	< 20	-	0.018		
	GL28-3-20160920	2016 09 20	7.57	1,280	-	-	-	6,550	-	-	< 5.0	< 250	-	49	< 1,000	4,140	858	-	-	-	-	< 2.5	-	-	-	20	-	0.0332		
	GL28-3-20170711	2017 07 11	8.13	2,480	-	-	-	6,160	-	-	8.4	690	-	48	< 1,000	4,000	840	-	-	-	-	< 2.5	-	-	-	< 20	-	0.0373		
	GL28-3-20170926	2017 09 26	7.6	2,520	-	-	-	6,150	-	-	< 5.0	1,120	-	49	< 400	4,100	807	-	-	-	-	< 1.0	-	-	-	< 20	-	0.0358		
	GL28-3-180528	2018 05 28	7.51	2,770	6.8	-	6,392	7,280	10.3	< 0.0050	29	5,640	< 10	45.9	230	3,780	870	870	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	23	< 0.0050	-		
	GL28-3-180925	2018 09 25	7.60	3,080	7	-	6,777	7,490	12.1	< 0.0050	76	7,780	47	49.6	280	4,350	827	827	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	35	< 0.0050	-		
	GL28-3-190528	2019 05 28	7.78	2,880	7	-	6743	6,780	8.29	< 0.0500	40	5,880	< 100	49.4	< 1,000	4,040	846	846	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	< 0.0500	-		
	DUP2-190528	Duplicate	7.63	2,830	7	-	6743	7,120	7.97	< 0.0500	44	6,130	< 100	62.1	< 1,000	4,170	855	855	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	< 0.0500	-		
	QA/QC RPD%		2	2	*	-	*	5	4	*	10	4	*	23	*	3	1	1	*	*	*	*	*	-	-	*	*	*		
	GL28-3-190919	2019 09 19	7.65	2,790	7.19	-	6895	7,490	8.62	-	26	4,180	< 100	51.7	< 1,000	4,100	865	865	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500		
	DUP1-190919	Duplicate	7.78	2,830	7.19	-	6895	7,330	8.84	-	37	4,000	< 100	48.8	< 1,000	3,900	844	844	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500		
	QA/QC RPD%		2	1	*	-	*	2	3	-	35	4	*	6	*	5	2	2	*	*	*	*	*	-	-	*	-	*		
	GL28-3-200610	2020 06 10	7.67	2,890	6.92	-	630.3	7,680	9.25	-	< 50	5,160	< 100	56.6	< 1,000	4,550	864	864	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	26	-	< 0.0500		
GL28-3-201105	2020 11 05	7.75	2,870	6.96	-	277.6	7,810	9.33	-	< 50	5,150	18	49.4	280	4,500	839	839	< 1.0	< 1.0	< 1.0	< 10.0	-	-	-	< 20	-	< 0.0050			
GL28-3-210609	2021 06 09	7.80	2,820	7.00	-	7,674	7,260	11.2	-	< 50	5,900	< 100	57.1	< 1,000	4,120	872	872	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	-	< 0.0500			
GL28-3-211007	2021 10 07	7.69	3,090	6.87	-	7,571	7,450	8.42	-	< 50	4,890	< 100	56.5	< 1,000	4,210	888	888	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	20	-	< 0.0500			

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* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters													Dissolved Inorganics											
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate
			mg/L	mg/L	mg/L	µS/cm	µS/cm	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
GL29-1	GL29-1-20130708	2013 07 08	-	444	-	-	-	1,160	-	-	216	< 100	-	24	1,000	186	910	-	-	-	-	< 1.0	-	-	-	< 20	-
	GL29-1-20131113	2013 11 13	-	493	-	-	-	1,280	-	-	219	< 100	-	36	1,190	356	836	-	-	-	-	-	-	-	-	< 20	-
	DUP3-20131113	Duplicate	-	495	-	-	-	1,240	-	-	206	< 100	-	37	1,180	358	750	-	-	-	-	-	-	-	-	< 20	-
	QA/QC RPD%		-	0	-	-	-	3	-	-	6	*	-	3	1	1	11	-	-	-	-	-	-	-	-	*	-
	GL29-1-20140603	2014 06 03	-	516	-	-	-	1,430	-	-	135	< 100	-	48	1,240	514	764	-	-	-	-	< 1.0	-	-	-	< 20	0.0088
	GL29-1-20141118	2014 11 18	-	699	-	-	-	1,950	-	-	253	< 100	-	74	1,230	958	708	-	-	-	-	< 1.0	-	-	-	37	0.002
	GL29-1-20150609	2015 06 09	8.12	629	-	-	-	1,900	-	-	244	< 25	-	63.5	1,200	804	692	-	-	-	-	0.29	-	-	-	27	0.0097
	GL29-1-20151105	2015 11 05	7.85	671	-	-	-	1,780	-	-	226	< 100	-	72	1,210	785	579	-	-	-	-	< 1.0	-	-	-	74	0.0161
	GL29-1-20160524	2016 05 24	7.94	682	-	-	-	1,650	-	-	61	640	-	77	1,220	667	593	593	< 1.0	< 1.0	-	< 1.0	-	-	-	116	0.0187
	GL29-1-20160921	2016 09 21	8.08	639	-	-	-	1,590	-	-	32.2	260	-	67	1,230	573	586	-	-	-	-	< 1.0	-	-	-	110	0.0231
	GL29-1-20170529	2017 05 29	8.1	586	-	-	-	1,300	-	-	20.6	1,100	-	57.9	1,130	408	642	-	-	-	-	< 0.50	-	-	-	90	0.0199
	GL29-1-20170926	2017 09 26	7.88	542	-	-	-	1,290	-	-	15.3	415	-	51.6	1,240	389	644	-	-	-	-	< 0.50	-	-	-	72	0.0243
	DUP1-20170926	Duplicate	7.88	539	-	-	-	1,330	-	-	17.9	383	-	53.1	1,240	401	645	-	-	-	-	< 0.50	-	-	-	72	0.0243
	QA/QC RPD%		0	1	-	-	-	3	-	-	*	8	-	3	0	3	0	-	-	-	-	*	-	-	-	0	0
	GL29-1-180604	2018 06 04	7.71	659	7.24	-	1,240	1,220	118	0.0343	166	26,900	< 10	58.1	310	161	450	450	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	321	0.0343
	GL29-1-180919	2018 09 19	7.70	683	7.38	-	1,389	1,190	93.7	< 0.0050	137	23,800	88	63.8	470	181	463	463	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	302	< 0.0050
	GL29-1-190603	2019 06 03	7.76	467	7.06	-	1715	1,160	12.8	< 0.0500	192	< 10	< 10	23.3	1,030	176	885	885	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	21	< 0.0500
	GL29-1-190924	2019 09 24	7.89	448	7	-	1731	1,160	11.1	-	102	< 10	< 10	29.7	1,180	211	820	820	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	25	< 0.0050
	GL29-1-200612	2020 06 12	7.04	421	7.01	-	1,380	1,110	6.25	-	199	< 100	< 100	21.8	< 1,000	185	758	-	-	-	-	< 1.00	-	-	-	31	< 0.0500
	GL29-1-201120	2020 11 20	7.84	442	7.07	-	1,723	1,050	3.16	-	230	< 10	< 10	22.9	1,290	172	814	814	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	< 20	< 0.0050
	GL29-1-210611	2021 06 11	7.90	460	7.00	-	1,705	1,070	3.11	-	200	< 100	< 100	22.1	1,320	183	859	859	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	< 20	< 0.0500
	GL29-1-211006	2021 10 06	7.89	436	7.37	-	1,660	1,100	6.01	-	222	< 10	< 10	26.6	1,310	190	801	801	< 1.0	< 1.0	< 1.0	< 0.10	-	-	-	< 20	< 0.0050
GL29-2	GL29-2-20130627	2013 06 27	-	2,830	-	-	-	7,910	-	-	67.9	< 250	-	243	2,200	5,020	335	-	-	-	-	< 2.5	-	-	-	69	-
	GL29-2-20131113	2013 11 13	-	2,910	-	-	-	7,890	-	-	99.1	< 250	-	252	1,400	4,820	351	-	-	-	-	-	-	-	-	53	-
	GL29-2-210608	2021 06 08	7.82	3,020	7.14	-	8,180	8,130	12.8	-	< 50	< 100	< 100	225	1,900	4,730	331	331	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	57	< 0.0500
	GL29-2-211006	2021 10 06	7.75	3,410	7.13	-	7,842	8,200	12.1	-	< 50	< 100	< 100	215	1,390	4,740	353	353	< 1.0	< 1.0	< 1.0	< 1.00	-	-	-	48	< 0.0500
	GL31-3-20130627	2013 06 27	-	4,240	-	-	-	15,300	-	-	2,300	< 500	-	863	600	8,470	2,810	-	-	-	-	< 5.0	-	-	-	85	-
GL31-3	GL31-3-20141126	2014 11 26	-	4,280	-	-	-	14,700	-	-	2,500	1,210	-	866	416	8,360	2,620	-	-	-	-	< 5.0	-	-	-	63	0.0085
	BH 11-18C-20120627	2012 06 27	-	4,600	-	-	-	15,500	-	-	2,300	-	-	821	-	7,800	2,580	-	-	-	-	-	-	-	-	80	0.013
	GL31-3-20121205	2012 12 05	-	4,470	-	-	-	15,400	-	-	2,450	< 10,000a	-	569	-	3,820	2,560	-	-	-	-	-	-	-	-	39	0.004
	GL31-3-20131114	2013 11 14	-	4,310	-	-	-	15,800	-	-	2,240	< 500	-	875	393	8,510	2,700	-	-	-	-	< 5.0	-	-	-	58	-
	GL31-3-20140609	2014 06 09	-	4,420	-	-	-	14,900	-	-	2,460	< 250	-	833	< 1,000	8,070	2,780	-	-	-	-	4	-	-	-	60	0.0049
	GL31-3-20150611	2015 06 11	7.83	4,460	-	-	-	13,400	-	-	2,490	< 500	-	839	< 2,000a	8,140	2,920	-	-	-	-	< 5.0	-	-	-	62	0.0046
	GL31-3-20151109	2015 11 09	7.55	4,060	-	-	-	15,200	-	-	2,640	< 500	-	857	< 2,000a	8,440	2,590	-	-	-	-	< 5.0	-	-	-	34	0.0076
	DUP4-20151109	Duplicate	7.5	4,060	-	-	-	15,200	-	-	2,380	< 500	-	861	< 2,000a	8,460	2,600	-	-	-	-	< 5.0	-	-	-	33	0.0094
	QA/QC RPD%		1	0	-	-	-	0	-	-	10	*	-	0	*	0	0	-	-	-	-	*	-	-	-	*	21

Associated CARO files available upon request.

Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.

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

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

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

RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics													
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate			
GL35-3	BH11-31C-20111217	2011 12 17	-	1,100	-	-	-	37,000	-	-	57,300	< 500	-	4,000	-	10,800	17,000	-	-	-	-	-	-	-	-	2,400	-	0.16		
	DUPB-20111217	Duplicate	-	1,090	-	-	-	37,900	-	-	56,600	< 500	-	4,110	-	10,900	15,600	-	-	-	-	-	-	-	-	2,500	-	0.17		
	QA/QC RPD%		-	1	-	-	-	2	-	-	1	*	-	3	-	1	9	-	-	-	-	-	-	-	-	4	-	6		
	BH11-31C-20120625	2012 06 25	-	2,740	-	-	-	10,900	-	-	2,740	-	-	546	-	5,150	2,620	-	-	-	-	-	-	-	-	50	-	0.008		
	GL35-3-20121205	2012 12 05	-	2,680	-	-	-	10,900	-	-	2,590	< 10,000a	-	520	-	5,330	2,290	-	-	-	-	-	-	-	-	48	-	0.004		
	DUP-C-20121205	Duplicate	-	2,720	-	-	-	10,800	-	-	2,720	< 10,000a	-	503	-	5,150	2,300	-	-	-	-	-	-	-	-	41	-	0.004		
	QA/QC RPD%		-	1	-	-	-	1	-	-	5	*	-	3	-	3	0	-	-	-	-	-	-	-	-	*	-	*		
	GL35-3-20130627	2013 06 27	-	2,220	-	-	-	8,910	-	-	2,330	< 250	-	475	2,200	4,630	2,400	-	-	-	-	-	2.6	-	-	38	-	-		
	DUP3-20130627	Duplicate	-	2,240	-	-	-	8,910	-	-	2,350	270	-	483	2,400	4,650	2,380	-	-	-	-	-	2.5	-	-	36	-	-		
	QA/QC RPD%		-	1	-	-	-	0	-	-	1	*	-	2	9	0	1	-	-	-	-	-	4	-	-	*	-	-		
	GL35-3-20131113	2013 11 13	-	2,280	-	-	-	9,430	-	-	1,310	< 250	-	482	1,400	4,250	2,380	-	-	-	-	-	-	-	-	46	-	-		
	GL35-3-20140609	2014 06 09	-	2,220	-	-	-	8,650	-	-	2,420	< 250	-	460	1,500	4,300	2,270	-	-	-	-	< 2.5	-	-	-	43	-	< 0.0010		
	GL35-3-20141126	2014 11 26	-	2,060	-	-	-	8,860	-	-	3,210	270	-	478	1,600	4,280	2,680	-	-	-	-	2.8	-	-	-	33	-	0.0076		
	GL35-3-20150611	2015 06 11	7.63	2,170	-	-	-	8,690	-	-	2,490	< 250	-	447	1,500	4,170	2,340	-	-	-	-	< 2.5	-	-	-	50	-	0.0037		
	GL35-3-20151109	2015 11 09	7.67	2,030	-	-	-	12,000	-	-	6,870	< 500	-	676	< 2,000a	5,210	3,610	-	-	-	-	< 5.0	-	-	-	198	-	1.36		
	GL35-3-20160526	2016 05 26	7.59	2,200	-	-	-	8,300	-	-	2,590	< 250	-	500	1,900	4,690	2,050	-	-	-	-	2.6	-	-	-	32	-	0.0291		
	GL35-3-20170926	2017 09 26	7.45	2,010	-	-	-	7,480	-	-	1,870	< 250	-	403	1,400	3,750	1,990	-	-	-	-	2.6	-	-	-	21	-	< 0.0010		
	GL35-3-180815	2018 08 15	7.29	2,070	6.98	-	6,480	8,230	7.93	< 0.0050	1,720	< 10	279	341	1,720	3,320	2,070	2,070	< 1.0	< 1.0	< 1.0	< 10.0	-	-	< 20	< 0.0050	-			
	GL35-3-190530	2019 05 30	7.58	2,000	6.85	-	9132	7,760	4.72	< 0.0500	1,220	< 100	< 100	351	1,730	3,510	2,000	2,000	< 1.0	< 1.0	< 1.0	< 1.00	-	-	26	< 0.0500	-			
	GL35-3-200608	2020 06 08	7.73	2,180	6.73	-	7,916	7,520	3.66	-	1,490	< 1,000	< 1,000a	325	1,410	3,410	1,920	1,920	< 1.0	< 1.0	< 1.0	< 10.0	-	-	< 20	-	< 0.500			
	DUPA-200608	Duplicate	7.73	2,080	6.73	-	7,916	7,520	4.14	-	1,470	< 100	< 100	365	1,130	3,280	1,910	1,910	< 1.0	< 1.0	< 1.0	1.78	-	-	< 20	-	< 0.0500			
	QA/QC RPD%		0	5	*	-	*	0	12	-	1	*	-	12	22	4	1	1	*	*	*	*	*	-	-	*	-	*		
	GL35-3-210610	2021 06 10	7.49	1,860	6.67	-	8,182	6,380	3.60	-	1,200	< 100	< 100	343	1,600	3,050	1,810	1,810	< 1.0	< 1.0	< 1.0	1.40	-	-	< 20	-	< 0.0500			
	DUP3-210610	Duplicate	7.47	1,870	6.67	-	8,182	6,440	3.54	-	1,210	< 100	< 100	337	1,630	3,050	1,790	1,790	< 1.0	< 1.0	< 1.0	1.48	-	-	< 20	-	< 0.0500			
	QA/QC RPD%		0	1	0	-	0	1	2	-	1	*	*	2	2	0	1	1	*	*	*	*	6	-	-	*	-	*		
GL37	GL37-20130708	2013 07 08	-	5,860	-	-	-	35,900	-	-	1,660	< 500	-	783	410	14,500	1,590	-	-	-	-	< 5.0	-	-	109	-	-			
	GL37-20131114	2013 11 14	-	5,970	-	-	-	28,600	-	-	1,370	< 500	-	1,030	343	18,600	1,580	-	-	-	-	6.3	-	-	44	-	-			
GL39-1	GL39-1-191205	2019 12 05	7.86	1,790	-	-	-	3,610	8.17	-	116	1,640	25	98.1	1,240	1,910	576	576	< 1.0	< 1.0	< 1.0	< 0.10	-	-	179	-	< 0.0050			
	GL39-1-200609	2020 06 09	7.81	2,120	7.02	-	3,724	3,710	6.40	-	56	4,470	< 1,000a	102	< 10,000a	2,110	598	598	< 1.0	< 1.0	< 1.0	< 10.0	-	-	22	-	< 0.500			
	GL39-1-201019	2020 10 19	7.85	1,970	7.03	-	4,547	4,140	8.10	-	< 50	5,840	< 10	134	1,230	2,120	574	574	< 1.0	< 1.0	< 1.0	< 0.10	-	-	29	-	< 0.0050			
	GL39-1-210526	2021 05 26	7.71	3,300	6.92	-	5,480	4,660	8.82	-	< 50	6,500	< 10	144	1,140	460	659	659	< 1.0	< 1.0	< 1.0	< 2.50	-	-	< 20	-	< 0.0050			
	GL39-1-210914	2021 09 14	-	2,630	6.96	-	5,187	5,370	9.04	-	< 50	5,300	< 10	149	1,290	2,790	677	677	< 1.0	< 1.0	< 1.0	< 1.00	-	-	22	-	< 0.0050			
GL39-2	GL39-2-191205	2019 12 05	7.93	1,940	-	-	-	5,110	7.99	-	121	1,140	12	176	470	2,790	407	407	< 1.0	< 1.0	< 1.0	< 0.10	-	-	152	-	< 0.0050			
	GL39-2-200609	2020 06 09	7.85	1,910	7.29	-	4,140	4,110	6.23	-	< 50	1,820	< 1,000a	174	< 10,000a	2,400	401	401	< 1.0	< 1.0	< 1.0	< 10.0	-	-	26	-	< 0.500			
	GL39-2-201016	2020 10 16	7.88	1,240	7.35	-	3,324	2,990	6.14	-	< 50	1,400	< 10	180	500	1,540	374	374	< 1.0	< 1.0	< 1.0	< 1.00	-	-	21	-	< 0.0050			
	DUP1-201016	Duplicate	7.90	1,260	7.69	-	1,582	3,090	5.89	-	< 50	1,440	< 10	181	< 2,500a	1,570	397	397	< 1.0	< 1.0	< 1.0	< 1.00	-	-	23	-	< 0.0050			
	QA/QC RPD%		0	2	*	-	*	3	4	-	*	3	*	1	*	2	6	6	*	*	*	*	*	-	-	*	-	*		
	GL39-2-210526	2021 05 26	7.98	1,090	7.31	-	3,323	2,350	5.28	-	< 50	588	< 10	154	510	1,250	436	436	< 1.0	< 1.0	< 1.0	< 2.50	-	-	< 20	-	< 0.0050			
	DUP 2-210526	Duplicate	7.98	1,100	7.31	-	3,323	2,090	5.32	-	< 50	700	< 10	159	500	1,240	435	435	< 1.0	< 1.0	< 1.0	< 2.50	-	-	< 20	-	< 0.0050			
	QA/QC RPD%		0	1	0	-	0	12	1	-	*	17	*	3	2	1	0	0	*	*	*	*	*	-	-	*	-	*		
GL39-2-210914	2021 09 14	-	1,800	7.27	-	4,281	3,820	5.79	-	< 50	1,940	< 10	130	410	2,140	472	472	< 1.0	< 1.0	< 1.0	< 2.50	-	-	30	-	< 0.0050				
GL40-3	GL40-3-201117	2020 11 17	8.09	311	7.31	-	4,621	3,000	66.4	-	11,400	< 100	< 100	201	< 1,000	375	2,190	2,190	< 1.0	< 1.0	< 1.0	< 1.00	-	-	2,430	-	< 0.0500			
	GL40-3-210610	2021 06 10	7.95	323	7.31	-	4,453	2,710	3.79	-	5,950	< 100	< 100	162	< 1,000	518	2,040	2,040	< 1.0	< 1.0	< 1.0	< 1.00	-	-	1,050	-	< 0.0500			
GL41-1	GL41-1-200616	2020 06 16	8.03	661	7.43	-	2,257	1,400	6.70	-	54	1,060	< 100	399	< 1,000	185	497	497	< 1.0	< 1.0	< 1.0	< 1.00	-	-	28	-	< 0.0500			
	GL41-1-201102	2020 11 02	8.03	735	7.56	-	248	1,530	5.81	-	< 50	1,570	< 10	371	720	138	592	592	< 1.0	< 1.0	< 1.0	< 0.10	-	-	23	-	0.0142			
	GL41-1-210525	2021 05 25	8.09	755	7.27	-	2,558	2,000	6.50	-	< 50	1,300	< 10	399	660	163	596	596	< 1.0	< 1.0	< 1.0	< 1.00	-	-	26	-	< 0.0050			

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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QA/QC RPD Denotes quality assurance/quality control relative percent difference
* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 1: Historical Summary of Analytical Results For Groundwater - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters														Dissolved Inorganics													
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bromide	Hydrogen Sulfide	Sulfide	Chemical Oxygen Demand	Dissolved Phosphate	Ortho-Phosphate			
GL41-2	GL41-2-191205	2019 12 05	8.05	530	-	-	-	1,230	6.32	-	174	1,560	50	301	700	138	558	558	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	< 0.0050			
	GL41-2-200612	2020 06 12	7.44	726	7.24	-	2,073	1,390	6.13	-	< 50	1,500	< 100	387	< 1,000	166	563	-	-	-	< 1.00	-	-	< 20	-	< 0.0500				
	DUPD-200612	Duplicate	7.50	743	7.24	-	2,073	1,370	6.38	-	< 50	1,460	< 100	404	< 1,000	164	559	-	-	-	< 1.00	-	-	< 20	-	< 0.0500				
	QA/QC RPD%		1	2	*	-	*	1	4	-	*	3	*	4	*	1	1	-	-	-	-	*	-	*	-	-	*			
	GL41-2-201022	2020 10 22	7.83	684	7.31	-	2,562	1,410	6.58	-	< 50	1,960	< 10	402	640	175	559	559	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0050			
GL41-3	GL41-2-210525	2021 05 25	8.05	753	7.17	-	2,498	1,400	6.37	-	< 50	1,780	< 10	423	670	151	595	595	< 1.0	< 1.0	< 1.0	< 2.50	-	-	24	-	< 0.0050			
	GL41-2-210907	2021 09 07	7.91	711	7.21	-	2,442	1,320	5.28	-	< 50	2,140	< 10	383	580	138	608	608	< 1.0	< 1.0	< 1.0	< 0.10	-	-	< 20	-	< 0.0050			
	GL41-3-200612	2020 06 12	7.40	755	7.26	-	2,133	1,580	6.68	-	141	1,180	< 100	423	< 1,000	159	575	-	-	-	< 1.00	-	-	< 200	-	< 0.0500				
	GL41-3-201022	2020 10 22	7.86	696	7.31	-	2,621	1,400	6.93	-	< 50	1,380	< 10	423	650	160	570	570	< 1.0	< 1.0	< 1.0	< 1.00	-	-	< 20	-	< 0.0050			
	GL41-3-210525	2021 05 25	8.05	792	7.20	-	2,646	1,340	6.71	-	< 50	1,510	< 10	471	660	160	618	618	< 1.0	< 1.0	< 1.0	< 2.50	-	-	24	-	< 0.0050			
	GL41-3-210907	2021 09 07	7.87	723	7.22	-	2,545	1,400	5.94	-	< 50	1,780	< 10	406	590	143	622	622	< 1.0	< 1.0	< 1.0	< 0.10	-	-	26	-	< 0.0050			
	DUP 1-210907	Duplicate	7.88	715	7.22	-	2,545	1,390	5.91	-	< 50	1,780	< 10	412	600	145	610	610	< 1.0	< 1.0	< 1.0	< 0.10	-	-	30	-	< 0.0050			
	QA/QC RPD%		0	1	0	-	0	1	1	-	*	0	*	1	2	1	2	2	*	*	*	*	-	-	-	-	*			
GL42-1	GL42-1-200612	2020 06 12	7.12	184	7.28	-	2,332	2,360	2.39	-	703	< 100	< 100	36.7	< 1,000	20.8	2,050	-	-	-	< 1.00	-	-	330	-	0.0580				
	GL42-1-201106	2020 11 06	7.80	171	7.27	-	5,266	3,620	2.95	-	743	< 10	< 10	47.6	560	1.3	3,030	3,030	< 1.0	< 1.0	< 1.0	0.34	-	-	35	-	< 0.0050			
	GL42-1-210603	2021 06 03	8.05	187	7.35	-	5,277	3,170	2.14	-	698	< 10	< 10	49.7	650	< 10.0	3,560	3,560	< 1.0	< 1.0	< 1.0	0.28	-	-	76	-	< 0.0050			
GL42-2	GL42-2-200616	2020 06 16	8.08	855	7.45	-	4,649	3,910	6.51	-	461	1,760	232	64.3	< 1,000	2,050	928	928	< 1.0	< 1.0	< 1.0	< 1.00	-	-	519	-	< 0.0500			
	GL42-2-201109	2020 11 09	7.76	1,270	7.34	-	5,360	4,220	7.70	-	83	883	153	63.6	590	2,250	918	918	< 1.0	< 1.0	< 1.0	< 10.0	-	-	89	-	< 0.0050			
	GL42-2-210607	2021 06 07	8.02	1,230	7.34	-	5,808	4,340	7.36	-	< 50	8,820	< 250	70.9	< 2,500a	2,220	1,020	1,020	< 1.0	< 1.0	< 1.0	< 2.50	-	-	< 20	-	< 0.125			

Associated CARO files available upon request.
Associated Exova file(s): 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 813438, 846260, 878316, 879073, 909346, 909448, 909654.
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QA/QC RPD Denotes quality assurance/quality control relative percent difference
* RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL Denotes reported detection limit.

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

			Physical Parameters										Dissolved Metals																													
Sample Location	Sample ID	Sample Date (yyyy mm dd)	pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Dissolved Aluminum	Dissolved Calcium	Dissolved Iron	Dissolved Magnesium	Dissolved Manganese	Dissolved Potassium	Dissolved Sodium	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Lithium	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	
09BH03	09BH03-20151105	2015 11 05	7.65	661	-	-	-	2,040	-	-	< 10	87.9	< 30	107	< 10	5	458	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.050	11.1	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	25.2	< 5.0	15.3	< 0.050	1,960	< 0.020	< 30	< 50	-	130	< 30	< 5.0	
	09BH03-20170601	2017 06 01	8.13	940	-	-	-	2,270	-	-	< 10	132	< 30	149	< 10	6.4	494	< 0.50	< 1.0	23	< 5.0a	< 100	< 0.050	11.5	< 0.50	1.7	< 1.0	< 50	< 0.20	21.5	< 5.0	45.8	< 0.050	2,570	< 0.020	< 30	< 50	-	124	< 30	< 5.0	
	09BH03-180604	2018 06 04	7.53	1,130	6.87	-	3,665	2,800	7.39	0.0075	< 5.0	156	153	179	< 0.20	6.95	604	< 0.20	0.63	17.4	< 0.10	14.4	0.045	21.0	0.17	8.16	< 0.20	29.9	< 0.010	26.4	3.25	44.8	< 0.050	3,300	< 0.020	< 0.20	< 5.0	< 1.0	168	1.5	< 4.0	
	09BH03-190530	2019 05 30	7.80	929	6.81	-	3120	2,460	5.85	0.0090	< 5.0	129	< 10	147	3.51	5.53	449	< 0.20	< 0.50	15.8	< 0.10	13.0	0.039	18.8	0.12	1.24	< 0.20	33.3	< 0.010	20.8	0.75	26.0	< 0.050	3,040	< 0.020	< 0.20	< 5.0	< 1.0	161	< 1.0	< 4.0	
	09BH03-200609	2020 06 09	7.80	1,270	7.04	-	3,178	3,020	7.88	-	1.2	184	< 2.0	197	0.089	7.9	92.3	0.064	0.500	24.1	< 0.010	13.3	0.0278	34.1	0.145	1.96	< 0.050	31.0	< 0.010	26.3	1.26	52.4	< 0.010	1,390	< 0.0040	< 0.050	< 0.20	< 0.20	207	1.91	1.1	
09BH04	09BH04-20151105	2015 11 05	7.19	1,120	-	-	-	2,730	-	-	< 10	147	10,100	183	681	14	617	< 0.50	5	30	< 5.0a	< 100	< 0.050	< 0.50	1.12	< 1.0a	< 1.0	252	< 0.20	14.9	< 5.0	< 1.0	< 0.050	3,080	< 0.020	< 30	< 50	-	48.5	< 30	< 5.0	
	09BH06-S-20131112	2013 11 12	-	353	-	-	-	700	-	-	< 10a	56.5	131	51.4	146	4.3	125	< 0.50	2.2	32	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	15	< 5.0	< 1.0	< 0.050	1,290	< 0.20	< 30	< 50	-	8.48	< 30	< 5.0	
	09BH06-S-20140602	2014 06 02	-	358	-	-	-	700	-	-	< 10a	56.6	152	52.5	159	4.2	130	< 0.50	2.2	34	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.8	< 5.0	< 1.0	< 0.050	1,270	< 0.20	< 30	< 50	-	8.2	< 30	< 5.0	
	09BH06-S-20141117	2014 11 17	-	354	-	-	-	713	-	-	< 10a	56.5	195	51.7	158	4.2	127	< 0.50	2.5	35	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.6	< 5.0	< 1.0	< 0.050	1,280	< 0.20	< 30	< 50	-	7.83	< 30	< 5.0	
	09BH06-S-20150610	2015 06 10	8.22	351	-	-	-	716	-	-	16	56.9	485	50.7	162	4.2	127	< 0.50	3.3	35	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.6	< 5.0	< 1.0	< 0.050	1,270	< 0.010	< 30	< 50	-	7.26	< 30	< 5.0	
09BH06-D	09BH06-S-20151105	2015 11 05	7.91	349	-	-	-	724	-	-	< 10	57.8	220	49.7	161	4.3	130	< 0.50	2.5	35	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.4	< 5.0	< 1.0	< 0.050	1,320	< 0.010	< 30	< 50	-	7.72	< 30	< 5.0	
	09BH06-D-20131112	2013 11 12	-	372	-	-	-	706	-	-	< 10a	60.5	371	53.6	164	4.3	129	< 0.50	2.7	40	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.4	< 5.0	< 1.0	< 0.050	1,390	< 0.20	< 30	< 50	-	9.62	< 30	< 5.0	
	DUP4-20131112	Duplicate	-	369	-	-	-	715	-	-	< 10a	59.9	360	53.3	160	4.2	127	< 0.50	2.7	39	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.4	< 5.0	< 1.0	< 0.050	1,370	< 0.20	< 30	< 50	-	9.36	< 30	< 5.0	
	QA/QC RPD%	-	1	-	-	-	-	1	-	-	*	1	3	1	2	2	2	*	0	3	*	*	*	*	*	*	*	*	*	0	*	*	*	*	*	*	*	*	*	*	*	*
	09BH06-D-20140602	2014 06 02	-	366	-	-	-	720	-	-	< 10a	58.9	351	53.2	158	4.2	127	< 0.50	2.6	40	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.2	< 5.0	< 1.0	< 0.050	1,330	< 0.20	< 30	< 50	-	9.13	< 30	< 5.0	
	09BH06-D-20141117	2014 11 17	-	372	-	-	-	743	-	-	< 10a	60.4	359	53.6	165	4.1	128	< 0.50	2.6	41	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.1	< 5.0	< 1.0	< 0.050	1,360	< 0.20	< 30	< 50	-	8.87	< 30	< 5.0	
	09BH06-D-20150610	2015 06 10	8.21	385	-	-	-	770	-	-	< 10	64	385	54.7	168	4.3	131	< 0.50	2.6	42	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	14.1	< 5.0	< 1.0	< 0.050	1,430	< 0.010	< 30	< 50	-	9	< 30	< 5.0	
	09BH06-D-20151105	2015 11 05	7.93	369	-	-	-	760	-	-	< 10	62	374	51.9	167	4.2	131	< 0.50	2.5	42	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	15.9	< 5.0	< 1.0	< 0.050	1,420	< 0.010	< 30	< 50	-	9.32	< 30	< 5.0	
	09BH06-D-20170606	2017 06 06	8.42	364	-	-	-	699	-	-	< 10	60.1	395	51.9	182	4.3	142	< 0.50	2.9	41	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	15.6	< 5.0	< 1.0	< 0.050	1,440	< 0.010	< 30	< 50	-	6.31	< 30	< 5.0	
	09BH06-D-180604	2018 06 04	7.76	387	6.99	-	1,289	800	2.98	0.0055	< 5.0	62.2	526	56.1	190	4.52	142	< 0.20	3.06	41.9	< 0.10	15.0	0.016	0.55	0.13	1.63	< 0.20	48.5	< 0.010	15.9	1.24	1.07	< 0.050	1,480	< 0.020	< 0.20	< 5.0	< 1.0	8.62	< 1.0	< 4.0	
	09BH06-D-190528	2019 05 28	8.04	435	7.08	-	1,229	968	2.88	0.0073	< 5.0	69.2	431	63.5	199	4.69	151	< 0.20	2.80	52.5	< 0.10	8.5	0.011	0.91	0.22	0.63	< 0.20	60.3	< 0.010	17.0	< 0.40	< 0.50	< 0.050	1,740	< 0.020	< 0.20	< 5.0	< 1.0	11.6	< 1.0	< 4.0	
	09BH06-D-200609	2020 06 09	7.95	422	7.3	-	1,038	849	2.26	-	< 1.0	70.1	459	60	199	4.73	156	< 0.050	2.85	48.2	< 0.010	15.0	0.0048	< 0.10	0.190	< 0.10	< 0.050	59.9	< 0.010	18.0	0.377	< 0.10	< 0.010	1,650	0.0045	< 0.050	< 0.20	< 0.20	10.2	< 0.20	< 1.0	
	09BH06-D-210608	2021 06 08	8.08	333	7.40	-	-	-	-	-	< 1.0	57.4	405	46	165	4.08	129	< 0.050	3.73	37.4	< 0.010	16.6	0.0048	< 0.10	0.143	0.11	< 0.050	46.9	< 0.010	18.6	0.287	< 0.10	< 0.010	1,150	< 0.0040	< 0.050	< 0.20	< 0.20	6.03	< 0.20	< 1.0	
	GL0-1	GL0-1-20130625	2013 06 25	-	427	-	-	-	771	-	-	38	71.2	99	60.6	763	11.4	83.7	1	4.8	92	< 5.0a	< 100	0.059	< 0.50	1.82	< 1.0a	< 1.0	< 50	< 0.20	29.8	23.2	1.7	< 0.050	1,210	< 0.20	< 30	< 50	-	11.2	< 30	< 5.0
		GL0-1-20140603	2014 06 03	-	416	-	-	-	711	-	-	< 10a	63.9	< 30	62.3	135	10.2	69.8	< 0.50	3.2	66	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	24.1											

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																												
			pH	Total Hardness mg/L	pH (field)	Conductivity μS/cm	Field Conductivity μS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum μg/L	Dissolved Calcium mg/L	Dissolved Iron μg/L	Dissolved Magnesium mg/L	Dissolved Manganese μg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony μg/L	Arsenic μg/L	Barium μg/L	Beryllium μg/L	Boron μg/L	Cadmium μg/L	Chromium μg/L	Cobalt μg/L	Copper μg/L	Lead μg/L	Lithium μg/L	Mercury μg/L	Molybdenum μg/L	Nickel μg/L	Selenium μg/L	Silver μg/L	Strontium μg/L	Thallium μg/L	Tin μg/L	Titanium μg/L	Tungsten μg/L	Uranium μg/L	Vanadium μg/L	Zinc μg/L
GL0-3	GL0-3-20130627	2013 06 27	-	762	-	-	-	1,500	-	-	< 10a	117	< 30	114	29	11	191	< 0.50	< 1.0	33	< 5.0a	< 100	0.096	< 0.50	1.79	< 1.0a	< 1.0	< 50	< 0.20	14.6	< 5.0	2.3	< 0.050	1,930	< 0.20	< 30	< 50	-	123	< 30	< 5.0
	GL0-3-20140603	2014 06 03	-	747	-	-	-	1,440	-	-	< 10a	114	< 30	112	< 10	10.2	180	< 0.50	< 1.0	27	< 5.0a	< 100	0.185	< 0.50	2.32	< 1.0a	< 1.0	< 50	< 0.20	15.1	< 5.0	2.4	< 0.050	1,960	< 0.20	< 30	< 50	-	120	< 30	< 5.0
	GL0-3-20141124	2014 11 24	-	797	-	-	-	1,440	-	-	< 10a	123	< 30	119	13	11.3	192	< 0.50	< 1.0	27	< 5.0a	< 100	0.087	< 0.50	3.55	44.9	< 1.0	< 50	< 0.20	14.8	< 5.0	2.5	< 0.050	1,930	< 0.20	< 30	< 50	-	119	< 30	26.9
	GL0-3-20150608	2015 06 08	7.65	772	-	-	-	1,390	-	-	< 10	120	< 30	115	< 10	10.7	179	< 0.50	< 1.0	26	< 5.0a	< 100	0.149	< 0.50	1.67	3.4	< 1.0	< 50	< 0.20	15.4	< 5.0	2.2	< 0.050	2,050	< 0.010	< 30	< 50	-	119	< 30	18.7
	GL0-3-20151103	2015 11 03	7.53	751	-	-	-	1,460	-	-	< 10	118	< 30	111	< 10	10.2	188	< 0.50	< 1.0	24	< 5.0a	< 100	0.132	< 0.50	1.71	2.2	< 1.0	< 50	< 0.20	15.2	< 5.0	1.8	< 0.050	2,100	< 0.010	< 30	< 50	-	122	< 30	12.3
	GL0-3-20160524	2016 05 24	8.1	754	-	-	-	1,450	-	-	< 10	117	< 30	112	< 10	10.2	179	< 0.50	< 1.0	23	< 5.0a	< 100	0.216	< 0.50	1.26	1.7	< 1.0	< 50	< 0.20	14.1	< 5.0	2.2	< 0.050	1,930	< 0.010	< 30	< 50	-	111	< 30	10.7
	GL0-3-20170524	2017 05 24	8.05	769	-	-	-	1,420	-	-	< 10	120	< 30	114	< 10	10.4	180	< 0.50	< 1.0	24	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	15.9	< 5.0	1.3	< 0.050	2,160	< 0.010	< 30	< 50	-	124	< 30	7.1
	GL0-3-180529	2018 05 29	7.81	799	7.28	-	1,826	1,480	5.47	0.0084	< 5.0	123	< 10	120	1.88	10.4	187	< 0.20	< 0.50	21.7	0.26	23.8	0.028	< 0.50	0.32	1.79	< 0.20	41.1	< 0.010	14.4	1.86	1.14	< 0.050	1,910	< 0.020	0.40	< 5.0	< 1.0	130	< 1.0	10.8
	GL0-3-190529	2019 05 29	7.77	1,110	7.12	-	2776	2,060	6.89	< 0.0050	< 5.0	176	< 10	163	1.91	12.4	239	< 0.20	< 0.50	30.4	0.26	29.3	0.059	1.60	0.59	3.11	< 0.20	52.3	< 0.010	13.8	2.67	10.8	< 0.050	2,980	< 0.020	0.57	< 5.0	< 1.0	198	< 1.0	26.2
	GL0-3-200310	2020 03 10	7.82	1,000	-	-	-	1,970	6.19	-	< 5.0	154	64	150	1.85	11.9	230	< 0.20	< 0.50	28.3	0.17	37.7	0.046	1.12	0.49	2.43	< 0.20	50.1	< 0.010	14.4	2.60	6.33	< 0.050	2,800	< 0.020	< 0.20	< 5.0	< 1.0	178	< 1.0	9.3
GL1-1	GL 1-1-20091109	2009 11 09	-	866	-	-	-	-	-	78	67.1	< 100	170	23	10.2	147	< 2	< 2	40	< 0.4	60	< 0.1	< 4	0.4	< 10a	< 1	40	-	21	< 10	< 6	< 0.10	3,120	< 0.1	< 1	< 10	-	36	1	< 10	
	GL1-1-20100810	2010 08 10	-	790	-	-	-	1,250	-	-	< 50a	62	< 100	155	9	10	140	< 2	< 2	40	< 0.4	70	< 0.10	< 4	0.3	< 10a	< 1	40	-	23	< 10	< 6	< 0.1	3,010	< 0.1	< 1	< 100	-	48	< 1	< 10
	GL30-1-20100810	Duplicate	-	780	-	-	-	1,300	-	-	85	61	160	152	35	14	154	< 2	< 6	40	< 0.4	50	< 0.10	< 4	0.4	< 10a	< 1	40	-	24	< 10	< 6	< 0.1	3,130	< 0.1	< 1	< 100	-	51	2	< 10
	QA/QC RPD%	-	1	-	-	-	-	4	-	-	*	2	*	2	118	33	10	*	*	0	*	33	*	*	*	*	*	0	-	4	*	*	*	4	*	*	*	-	6	*	*
	GL1-1-20160531	2016 05 31	7.43	-	-	-	-	1,290	-	-	< 50	71.2	< 100	182	27	-	174	< 1	< 5	50	< 1	60	< 0.1a	< 5	< 0.5	< 2a	< 1	49	-	24	< 2	< 5	< 0.5	3,410	< 0.2	-	< 50	-	56.3	< 10	-
	GL1-1-20180927	2018 09 27	-	730	-	-	-	-	-	-	< 5.0	58.9	< 10	142	53	9.78	154	< 0.20	0.51	41	< 0.10	63.7	0.142	< 0.50	0.2	1.06	< 0.20	38.9	< 0.010	27.3	1.77	1.02	< 0.050	2,830	< 0.020	< 0.20	< 5.0	-	48.9	< 1.0	< 4.0
	GL1-1-180612	2018 06 12	7.75	743	-	-	-	1,160	-	0.0115	< 5.0	58.3	< 10	145	36.5	9.94	155	< 0.20	< 0.50	42.6	< 0.10	44.7	0.118	< 0.50	0.17	1.01	< 0.20	41.8	< 0.010	26.8	1.78	1.71	< 0.050	2,890	< 0.020	< 0.20	< 5.0	< 1.0	49.6	< 1.0	< 4.0
	GL1-1-190917	2019 09 17	7.94	763	-	-	-	1,200	4.15	-	< 5.0	60.0	< 10	149	33.2	9.61	164	< 0.20	0.61	45.7	< 0.10	55.3	0.154	1.14	0.17	0.95	< 0.20	43.7	-	33.2	1.96	< 0.50	< 0.050	3,160	< 0.020	< 0.20	< 5.0	< 1.0	55.1	< 1.0	< 4.0
	GL1-1-200910	2020 09 10	8.12	746	-	-	-	1,200	3.45	-	2.4	63.4	3.4	143	29.4	9.46	153	0.095	0.624	43.0	< 0.010	45.8	0.123	0.19	0.156	1.28	0.078	39.7	-	29.6	1.85	0.41	< 0.010	3,120	0.0073	< 0.050	0.20	0.42	54.6	0.21	2.9
	GL1-2	GL 1-2-20091109	2009 11 09	-	909	-	-	-	-	-	66	65.4	< 100	181	2	10.2	144	< 2	< 2	40	< 0.4	60	< 0.1	< 4	0.3	< 10a	< 1	50	-	20	< 10	< 6	< 0.10	3,160	< 0.1	< 1	< 10	-	36	2	< 10
GL1-2-20100810		2010 08 10	-	840	-	-	-	1,140	-	-	< 50a	65	< 100	164	< 2	10	132	< 2	< 2	40	< 0.4	70	< 0.1	< 4	0.4	< 10a	< 1	40	-	20	< 10	< 6	< 0.1	3,220	< 0.1	< 1	< 100	-	46	2	< 10
GL1-2-20160531		2016 05 31	7.66	-	-	-	-	1,190	-	-	< 50	69.3	< 100	174	< 2	-	161	< 1	< 5	< 50	< 1	60	< 0.1a	< 5	< 0.5	< 2a	< 1	49	-	21	< 2	< 5	< 0.5	3,310	< 0.2	-	< 50	-	49	< 10	< 40
GL1-2-180612		2018 06 12	7.84	790	-	-	-	1,230	-	0.0102	< 5.0	61.7	< 10	154	0.34	10.8	169	< 0.20	0.99	64.4	< 0.10	49.8	0.022	< 0.50	< 0.10	1.83	< 0.20	38.1	< 0.010	28.0	1.34	0.78	< 0.050	3,040	< 0.020	< 0.20	< 5.0	< 1.0	61.6	4.2	< 4.0
GL1-2-20180927		2018 09 27	-	759	-	-	-	-	-	-	< 5.0	59.2	< 10	148	14.7	10.6	149	< 0.20	0.7	47.1	< 0.10	45.4	0.029	< 0.50	0.1	0.95	< 0.20	38.5	< 0.010	18.5	1.18	1.59	< 0.050	2,910	< 0.020	< 0.20	< 5.0	-	49.8	3.2	< 4.0
GL1-2-190917		2019 09 17	7.98	762	-	-	-	1,240	4.46	-	< 5.0	60.7	< 10	148	4.15	9.95	147	< 0.20	0.56	47.0	< 0.10	43.6	0.036	1.03	< 0.10	0.88	< 0.20	42.7	-	23.0	1.24	0.75	< 0.050	3,160	< 0.020	< 0.20	< 5.0	< 1.0	58.1	2.5	< 4.0
GL1-2-200910		2020 09 10	8.14	814	-	-	-	1,300	4.98	-	2.2	68.1	< 2.0	156	3.48	10.8	157	0.087	0.752	49.8	< 0.010	39.2	0.0328	0.13	0.143	1.24	< 0.050	40.0	-	23.5	1.24	0.26	< 0.010	3,510	< 0.0040	< 0.050	0.26	< 0.20	59.8	2.34	< 1.0
GL 2-1-20091109		2009 11 09	-	3																																					

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																													
			pH	Total Hardness	pH (field)	Conductivity	Field Conductivity	Total Dissolved Solids	Dissolved Organic Carbon	Phosphate	Dissolved Aluminum	Dissolved Calcium	Dissolved Iron	Dissolved Magnesium	Dissolved Manganese	Dissolved Potassium	Dissolved Sodium	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Lithium	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	
GL2-1 (Cont'd)	GL2-1-200609	2020 06 09	7.90	556	7.36	-	1,202	970	1.54	-	< 1.0	124	1,220	60	157	4.45	122	< 0.050	2.46	92.7	< 0.010	12.3	0.0075	< 0.10	0.0524	0.23	< 0.050	14.1	< 0.010	14.3	0.127	< 0.10	< 0.010	29.0	< 0.0040	< 0.050	< 0.20	< 0.20	5.07	< 0.20	< 1.0	
	GL2-1-200820	2020 08 20	8.10	473	7.46	-	1,435	1,000	1.72	-	1.6	106	1,210	50.8	129	3.92	98.7	< 0.050	2.82	88.1	< 0.010	11.7	0.0068	0.15	0.0583	< 0.10	< 0.050	12.8	< 0.010	13.8	0.077	< 0.10	< 0.010	39.0	< 0.0040	< 0.050	< 0.20	< 0.20	4.13	< 0.20	< 1.0	
	DUPA-200820	Duplicate	8.10	476	7.46	-	1,435	992	2.18	-	3.0	107	1,200	51	130	3.98	99.4	< 0.050	2.81	87.3	< 0.010	11.4	0.0057	0.12	0.0449	< 0.10	< 0.050	12.9	< 0.010	13.7	0.079	< 0.10	< 0.010	39.5	< 0.0040	0.113	< 0.20	< 0.20	4.13	< 0.20	< 1.0	
GL2-2	QA/QC RPD%		0	1	*	-	*	1	*	-	*	1	1	0	1	2	1	*	0	1	*	3	*	26	*	*	*	1	*	*	*	*	*	*	*	*	*	0	*	*	*	
	GL2-1-201019	2020 10 19	8.10	513	7.6	-	1,508	1,030	2.10	-	< 1.0	125	1,490	48.8	129	4.18	101	< 0.050	3.25	76.5	< 0.010	6.3	< 0.0020	< 0.10	0.0526	< 0.10	< 0.050	11.2	< 0.010	14.9	0.087	< 0.10	< 0.010	3,840	< 0.0040	< 0.050	< 0.20	< 0.20	4.03	< 0.20	< 1.0	
	GL2-1-210512	2021 05 12	8.06	515	-	-	-	-	-	-	< 1.0	119	954	53	126	4.24	117	< 0.050	2.37	72.9	< 0.010	11.0	0.0050	0.17	0.0343	< 0.10	< 0.050	13.6	< 0.010	14.1	0.093	< 0.10	< 0.010	3,840	< 0.0040	0.052	< 0.20	< 0.20	4.14	< 0.20	< 1.0	
	GL2-1-211005	2021 10 05	7.85	583	7.55	-	-	-	-	-	7.5	134	1,130	60.3	126	4.4	127	< 0.050	2.12	73.5	< 0.010	40.7	0.0095	0.15	0.0426	0.56	< 0.050	13.8	< 0.010	15.4	0.084	< 0.10	< 0.010	3,620	< 0.0040	< 0.050	0.63	< 0.20	3.82	< 0.20	< 1.0	
	GL2-2-20091109	2009 11 09	-	359	-	-	-	-	-	-	417	70.2	380	44.7	68	3.8	72.7	< 2	< 2	70	< 0.4	< 40	< 0.10	< 4	0.6	< 10a	< 1	10	-	5	< 10	< 6	< 0.10	2,430	< 0.1	< 1	< 10	-	< 4	1	< 10	
	GL2-2-20100810	2010 08 10	-	350	-	-	-	598	-	-	< 50a	70	< 100	43	20	3	67	< 2	< 2	60	< 0.4	< 40	< 0.10	< 4	< 0.2	< 10a	< 1	10	-	5	< 10	< 6	< 0.1	2,480	< 0.1	< 1	< 100	-	8	< 1	< 10	
	GL2-2-200826	2020 08 26	8.06	405	7.36	-	1,142	751	1.29	-	16.9	81.7	42.9	48.8	128	3.59	74.7	< 0.050	1.17	90.3	< 0.010	9.4	0.0636	0.18	0.38	< 0.050	9.73	< 0.010	9.21	0.396	< 0.10	< 0.010	3,280	< 0.0040	0.062	1.15	< 0.20	4.38	0.61	< 1.0		
	GL2-2-201020	2020 10 20	7.91	464	7.55	-	1,234	810	1.25	-	< 1.0	108	23.7	47.2	98.6	3.96	74.5	< 0.050	1.21	109	< 0.010	6.6	0.232	0.27	0.27	< 0.050	10.2	< 0.010	10.4	0.268	< 0.10	< 0.010	4,010	< 0.0040	< 0.050	< 0.20	< 0.20	4.14	< 0.20	1.8		
GL3-2	GL2-2-210513	2021 05 13	7.91	485	7.49	-	-	-	-	-	< 1.0	102	49.2	55.9	76.4	4.43	97.6	0.055	1.15	108	< 0.010	13.6	0.0297	0.12	0.62	< 0.050	12.6	< 0.010	9.93	0.113	< 0.10	< 0.010	3,370	< 0.0040	< 0.050	< 0.20	< 0.20	3.57	< 0.20	< 1.0		
	GL2-2-211005	2021 10 05	7.92	511	7.45	-	-	-	-	-	< 1.0	109	125	58.1	202	4.3	99.8	< 0.050	1.36	104	< 0.010	52.2	0.0544	0.21	0.59	< 0.050	12.4	< 0.010	14.0	0.354	< 0.10	< 0.010	3,450	< 0.0040	< 0.050	< 0.20	< 0.20	3.63	< 0.20	< 1.0		
	GL3-2-20080529	2008 05 29	-	-	-	-	-	-	-	-	370	35.6	630	56.1	175	6.8	161	< 2	6	50	< 1	< 20	7	< 5	< 10a	2	< 10	-	30	< 5	2	< 0.10	1,210	< 0.5	< 10	31	-	9	2	< 10		
	GL3-2-20081104	2008 11 04	-	-	-	-	-	-	-	-	177	36	460	55.6	124	6.4	156	< 0.2	5.1	42	< 0.1	18	0.4	0.8	1	0.2	11	-	37	1.8	< 0.2	< 0.01	1,280	< 0.05	< 1	17.2	-	6.7	0.7	5		
	GL3-2-20091116	2009 11 16	-	337	-	-	-	-	-	-	74	40.7	270	57.3	115	6.7	171	< 2	6	40	< 0.4	< 40	0.2	< 4	< 10a	< 1	< 10	-	34	< 10	< 6	< 0.10	1,200	< 0.1	< 1	< 10	-	6	< 1	< 10		
	GL3-2-20100810	2010 08 10	-	320	-	-	-	750	-	-	88	34	< 100	57	135	6	162	< 2	4	40	< 0.4	< 40	0.2	< 4	< 10a	< 1	< 10	-	31	< 10	< 6	< 0.1	1,180	< 0.1	< 1	< 100	-	8	< 1	< 10		
	GL3-3-19990505	1999 05 05	-	-	-	-	-	-	-	-	67	104	1,620	258	664	53.9	335	< 5	< 10	241	< 0.5	825	4.8	< 0.8	2	< 2	33	-	< 1	2	< 4	< 1a	2,480	< 4a	13	< 0.4	-	-	< 0.1	< 0.6		
	GL3-3	GL3-3-19990928	1999 09 28	-	-	-	-	-	-	-	-	73	110	1,060	261	585	59.4	321	< 5	< 10	242	< 0.5	944	7	< 0.8	1	7	37	-	< 1	5	< 4	< 1a	2,380	< 4a	17	< 0.4	-	-	3	0.6	
GL3-3-19991202		1999 12 02	-	-	-	-	-	-	-	-	44	109	2,530	268	584	67.8	330	< 5	< 10	244	< 0.5	992	< 0.5a	< 0.8	5.5	2	3	40	-	< 1	3	< 4	< 1a	2,510	< 4a	11	< 0.4	-	-	1	2.1	
GL3-3-20080529		2008 05 29	-	-	-	-	-	-	-	-	< 50a	32.5	6,180	52.2	131	6	151	< 2	< 2	20	< 1	< 20	< 0.1a	< 5	< 1	< 10a	2	< 10	-	20	< 5	< 2	< 0.10	1,160	< 0.5	< 10	10	-	8	< 1	< 10	
GL3-3-20081104		2008 11 04	-	-	-	-	-	-	-	-	25	37.1	1,160	61.8	178	7.1	158	< 0.2	1.7	24	< 0.1	29	< 0.01	0.6	0.2	< 1a	< 0.1	12	-	30	1.7	< 0.2	< 0.01	1,350	< 0.05	< 1	8.4	-	8.8	0.6	3	
GL3-5-20130627		2013 06 27	-	1,260	-	-	-	-	-	-	< 10a	179	13,700	199	677	61.9	237	< 0.50	< 1.0	485	< 5.0a	1,810	< 0.050	0.68	3.12	< 1.0a	< 1.0	< 50	< 0.20	< 1.0	< 5.0	< 1.0	< 0.050	2,950	< 0.20	< 30	< 50	-	< 0.20	< 30	< 5.0	
GL3-5 (2012)-20140609		2014 06 09	-	1,230	-	-	-	-	-	-	< 10a	165	5,700	200	487	59.7	229	< 0.50	< 1.0	441	< 5.0a	1,760	< 0.050	0.55	3.86	< 1.0a	< 1.0	< 50	< 0.20	< 1.0	< 5.0	< 1.0	< 0.050	2,830	< 0.20	< 30	< 50	-	< 0.20	< 30	< 5.0	
GL3-5 (2012)-20141125		2014 11 25	-	1,330	-	-	-	-	-	-	< 10a	168	19,500	222	569	56.5	232	< 0.50	1.7	490	< 5.0a	1,790	< 0.050	0.7	3.36	< 1.0a	< 1.0	< 50	< 0.20	< 1.0	< 5.0	< 1.0	< 0.050	3,270	< 0.20	< 30	< 50	-	0.31	< 30	< 5.0	
GL3-5 (2012)-20150609		2015 06 09	7.43	1,240	-	-	-	-	-	-	11	170	27,800	199	414	67.5	243	< 0.50	2.4	470	< 5.0a	1,800	< 0.050	1.03	7.3	< 1.0a	< 1.0															

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters									Dissolved Metals																														
			pH	Total Hardness mg/L	pH (field)	Conductivity μS/cm	Field Conductivity μS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum mg/L	Dissolved Calcium mg/L	Dissolved Iron μg/L	Dissolved Magnesium mg/L	Dissolved Manganese μg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony μg/L	Arsenic μg/L	Barium μg/L	Beryllium μg/L	Boron μg/L	Cadmium μg/L	Chromium μg/L	Cobalt μg/L	Copper μg/L	Lead μg/L	Lithium μg/L	Mercury μg/L	Molybdenum μg/L	Nickel μg/L	Selenium μg/L	Silver μg/L	Strontium μg/L	Thallium μg/L	Tin μg/L	Titanium μg/L	Tungsten μg/L	Uranium μg/L	Vanadium μg/L	Zinc μg/L	
GL5-1	GL5-1-20091116	2009 11 16	-	77	-	-	-	-	-	< 50a	3.4	< 100	16.6	4	10.6	539	< 2	< 2	< 10	< 0.4	< 40	< 0.1	< 4	< 0.2	< 10a	< 1	580	-	7	< 10	< 6	< 0.10	1,050	< 0.1	< 1	< 10	-	< 4	< 1	< 10		
	GL5-1-20100810	2010 08 10	-	110	-	-	-	1,690	-	71	13	840	20	34	9	604	< 2	< 2	10	< 0.4	40	< 0.1	< 4	< 0.2	< 10a	1	750	-	7	< 10	< 6	< 0.1	2,030	< 0.1	< 1	< 100	-	< 4	< 1	50		
	GL5-2-20180528	2018 05 28	7.83	671	-	-	-	1,370	-	< 5.0	79.8	< 10	115	0.44	7.77	268	< 0.20	< 0.50	60.6	< 0.10	30.8	0.02	3.92	< 0.10	1.03	< 0.20	39.3	< 0.010	9.37	< 0.40	4.95	< 0.050	4,900	< 0.020	< 0.20	< 5.0	-	20	3.7	< 4.0		
GL5-2	GL5-2-20091116	2009 11 16	-	602	-	-	-	-	-	132	68	180	105	12	7.6	128	< 2	< 2	30	< 0.4	< 40	< 0.1	< 4	0.2	< 10a	< 1	40	-	16	< 10	< 6	< 0.10	3,680	< 0.1	< 1	20	-	26	5	< 10		
	GL30-1-20091116	Duplicate	-	597	-	-	-	-	-	< 50a	67.5	< 100	104	10	7.7	124	< 2	< 2	30	< 0.4	< 40	< 0.1	< 4	< 0.2	< 10a	< 1	40	-	17	< 10	< 6	< 0.10	3,590	< 0.1	< 1	< 10	-	25	4	< 10		
	QA/QC RPD%	-	-	1	-	-	-	-	-	*	1	*	1	18	1	3	*	*	0	*	*	*	*	*	*	*	*	0	-	6	*	*	*	2	*	*	*	-	4	22	*	
	GL5-2-20100810	2010 08 10	-	640	-	-	-	1,050	-	134	68	< 100	113	10	8	129	< 2	< 2	30	< 0.4	< 40	< 0.10	< 4	0.4	< 10a	< 1	40	-	15	< 10	< 6	< 0.1	3,750	< 0.1	< 1	< 100	-	27	4	< 10		
	GL30-3-20100810	Duplicate	-	640	-	-	-	1,120	-	147	69	150	113	11	10	134	< 2	< 2	40	< 0.4	< 40	< 0.10	< 4	0.2	< 10a	< 1	40	-	14	< 10	< 6	< 0.1	3,870	< 0.1	< 1	< 100	-	28	5	10		
	QA/QC RPD%	-	-	0	-	-	-	6	-	9	1	*	0	10	22	4	*	*	29	*	*	*	*	*	*	*	0	-	7	*	*	*	3	*	*	*	-	4	22	*		
	GL5-2-20110704	2011 07 04	-	778	-	-	-	1,080	-	< 5	84.4	6	138	4	8.6	152	< 0.2	0.5	34	< 0.04	33	0.02	0.9	0.45	< 1a	< 0.1	45	-	17.1	1	1.8	< 0.01	4,300	< 0.01	< 0.1	< 10	-	24.3	7.4	< 1		
	GL 5-2-20120627	2012 06 27	-	710	-	-	-	1,160	-	< 50a	78	100	126	< 10	8	150	< 2	< 2	30	< 0.4	< 40	< 0.1	7	< 0.2	< 10a	< 1	40	-	14	< 10	< 6	< 0.10	4,160	< 0.1	< 1	< 100	-	23	5	< 10		
	DUP C-20120627	Duplicate	-	730	-	-	-	1,130	-	< 50a	79	140	129	< 10	7	158	< 2	< 2	40	< 0.4	< 40	< 0.1	4	< 0.2	< 10a	< 1	40	-	15	< 10	< 6	< 0.10	4,100	< 0.1	< 1	< 100	-	26	5	< 10		
	QA/QC RPD%	-	-	3	-	-	-	3	-	*	1	33	2	*	13	5	*	*	29	*	*	*	55	*	*	*	*	0	-	7	*	*	*	1	*	*	*	-	12	0	*	
	GL5-2-20121205	2012 12 05	-	659	-	-	-	1,060	-	52	72.3	97	116	< 10	7.7	145	< 2.0	< 2.0	30	< 0.40	50	< 0.10	5.1	< 0.20	< 10a	< 1	50	-	17.4	< 10	< 6.0	< 0.10	3,980	< 0.10	< 1.0	< 100	-	27.7	5.28	< 10		
	GL5-2-20130626	2013 06 26	-	726	-	-	-	1,150	-	< 10a	80.9	< 30	127	10	8.9	163	< 0.50	< 1.0	35	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	18.6	< 5.0	< 1.0	< 0.050	3,770	< 0.20	< 30	< 50	-	28.1	< 30	< 5.0		
	GL5-2-20131114	2013 11 14	-	687	-	-	-	1,110	-	< 10a	77.6	< 30	120	11	8.8	187	< 0.50	< 1.0	34	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	19.3	< 5.0	< 1.0	< 0.050	3,870	< 0.20	< 30	< 50	-	27.9	< 30	< 5.0		
	GL5-2-20140603	2014 06 03	-	655	-	-	-	1,130	-	< 10a	73.7	< 30	114	< 10	8.1	174	< 0.50	< 1.0	37	< 5.0a	< 100	0.06	< 0.50	< 0.50	< 1.0a	< 1.0	51	< 0.20	19.2	< 5.0	< 1.0	< 0.050	3,660	< 0.20	< 30	< 50	-	26.7	< 30	< 5.0		
	GL5-2-20141118	2014 11 18	-	636	-	-	-	1,000	-	< 10a	71.1	< 30	111	12	8.1	160	< 0.50	< 1.0	33	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	19.1	< 5.0	< 1.0	< 0.050	3,750	< 0.20	< 30	< 50	-	27.2	< 30	< 5.0		
	DUP2-20141118	Duplicate	-	635	-	-	-	1,070	-	< 10a	70.2	< 30	112	12	8.2	161	< 0.50	< 1.0	33	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	17.4	< 5.0	< 1.0	< 0.050	3,730	< 0.20	< 30	< 50	-	24	< 30	< 5.0		
	QA/QC RPD%	-	-	0	-	-	-	7	-	*	1	*	1	0	1	1	*	*	0	*	*	*	*	*	*	*	*	0	-	9	*	*	*	1	*	*	*	-	12	*	*	
	GL5-2-20150608	2015 06 08	7.65	956	-	-	-	1,890	-	< 10	121	< 30	159	< 10	10.4	315	< 0.50	< 1.0	64	< 5.0a	< 100	< 0.050	1.7	< 0.50	< 1.0a	< 1.0	68	< 0.20	12.1	< 5.0	< 1.0	< 0.050	6,010	< 0.010	< 30	< 50	-	24.1	< 30	< 5.0		
	GL5-2-20151103	2015 11 03	7.94	623	-	-	-	1,060	-	< 10	74.8	< 30	106	< 10	8.1	183	< 0.50	< 1.0	34	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	17.4	< 5.0	< 1.0	< 0.050	3,980	< 0.010	< 30	< 50	-	26.9	< 30	< 5.0		
	GL5-2-20160526	2016 05 26	7.97	879	-	-	-	1,960	-	< 10	116	< 30	143	< 10	10	384	< 0.50	< 1.0	69	< 5.0a	< 100	2.39	4.26	< 0.50	< 1.0a	< 1.0	74	< 0.20	11.6	< 5.0	2.9	< 0.050	5,680	< 0.020	< 30	< 50	-	20.7	< 30	< 5.0		
	GL5-2-20170525	2017 05 25	8.22	782	-	-	-	1,690	-	< 10	102	< 30	128	< 10	9.1	331	< 0.50	< 1.0	63	< 5.0a	< 100	< 0.050	3.64	< 0.50	< 1.0a	< 1.0	65	< 0.20	11.3	< 5.0	3.6	< 0.050	5,330	< 0.020	< 30	< 50	-	20.7	< 30	< 5.0		
	DUP1-20170525	Duplicate	8.28	787	-	-	-	1,670	-	< 10	102	< 30	129	< 10	9.3	336	< 0.50	< 1.0	64	< 5.0a	< 100	< 0.050	3.59	< 0.50	< 1.0a	< 1.0	65	< 0.20	11.5	< 5.0	3.5	< 0.050	5,370	< 0.020	< 30	< 50	-	20.4	< 30	< 5.0		
	QA/QC RPD%	-	-	1	-	-	-	1	-	*	0	*	*	1	*	2	1	*	*	2	*	*	*	1	*	*	*	0	-	2	*	3	*	1	*	*	*	-	1	*	*	
	GL5-3	GL5-2-180528	2018 05 28	7.83	671	7.08	-	2,100	1,370	4.60	< 0.0050	< 5.0	79.8	< 10	115	0.44	7.77	268	< 0.20	< 0.50	60.6	< 0.10	30.8	0.020	3.92	< 0.10	1.03	< 0.20	39.3	< 0.010	9.37	< 0.40	4.95	< 0.050	4,900	< 0.020	< 0.20	< 5.0	< 1.0	20.0	3.7	< 4.0
		GL5-2-190527	2019 05 27	7.96	638	7.43	-	2396	1,300	4.40	0.0051	5.9	87.3	< 10	102	0.75	7.33	249	< 0.20	< 0.50	66.8	< 0.10	38.8	0.057	2.09	< 0.10	3.18	< 0.20	50.3	< 0.010	12.2	0.52	6.80	< 0.050	5,240	< 0.020	< 0.20	< 5.0	< 1.0	23.1	3.6	< 4.0
		GL5-2-200611	2020 06 11	7.83	501	7.21	-																																			

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																												
			pH	Total Hardness mg/L	pH (field)	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum mg/L	Dissolved Calcium mg/L	Dissolved Iron µg/L	Dissolved Magnesium mg/L	Dissolved Manganese mg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Boron µg/L	Cadmium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Lead µg/L	Lithium µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L
GL6-1 (2011)	GL6-1 (2011)-190603	2019 06 03	7.80	1,270	7.42	11,200	11903	6,100	175	1.15	86.8	190	507	192	412	421	1,490	1.10	5.96	321	< 0.10	2,660	< 0.010	16.7	21.7	11.9	< 0.20	41.5	< 0.010	1.44	19.3	0.50	< 0.050	3,160	< 0.020	4.82	11.2	1.9	19.2	3.1	< 4.0
	DUP3-190603	Duplicate	7.72	1,240	7.42	-	11903	8,100	180	0.560	87.1	191	467	185	402	427	1,420	1.09	5.93	320	< 0.10	2,710	< 0.010	16.8	21.6	< 0.40a	< 0.20	39.3	< 0.010	1.27	19.1	0.60	< 0.050	3,140	< 0.020	4.80	11.3	1.9	11.6	3.1	< 4.0
	QA/QC RPD%		1	2	*	-	*	28	3	69	0	1	8	4	2	1	5	1	1	0	*	2	*	1	0	*	*	5	*	13	1	*	*	1	*	0	1	*	49	0	*
GL7-1	GL6-1-200611	2020 06 11	7.82	962	7.1	8,440	6,871	5,220	241	-	79.8	151	191	142	295	382	1,200	1.70	6.48	367	0.025	2,180	0.0081	18.1	22.2	0.88	0.151	28.1	< 0.010	1.31	23.7	0.86	< 0.010	2,850	< 0.0040	4.82	15.7	2.04	1.95	3.61	1.8
	GL6-1-210610	2021 06 10	7.07.72	1,230	6.99	-	-	-	-	-	79.0	229	1,180	160	439	356	988	0.810	4.88	398	0.029	3,510	0.0069	14.2	20.3	0.50	0.237	41.4	< 0.010	1.02	17.0	1.22	< 0.010	2,850	< 0.0040	3.19	11.2	1.67	0.228	2.69	2.3
	GL7-1-20110704	2011 07 04	-	1,190	-	-	-	2,560	-	-	< 5	176	5,590	182	1,060	21.4	492	< 0.2	36.4	15	2.2	148	0.02	62.9	1.75	1	0.4	266	-	56.3	9	19.8	< 0.01	4,680	< 0.01	< 0.1	< 10	-	80.8	17.8	11
	GL7-1-20120625	2012 06 25	-	1,150	-	-	-	2,590	-	-	< 50a	164	12,600	180	1,260	20	509	< 2	13	10	1.6	160	< 0.1	7	1.9	< 10a	< 1	260	-	42	< 10	< 6	< 0.10	4,580	< 0.1	< 1	< 100	-	74	2	20
	GL7-1-20121205	2012 12 05	-	1,120	-	-	-	2,500	-	-	54	159	5,360	176	971	18.7	496	< 2.0	22.5	20	2.64	160	< 0.10	12.2	4.81	< 10a	< 1.0	300	-	60.2	< 10	< 6.0	< 0.10	4,440	< 0.10	< 1	< 100	-	85.6	3.27	10
	GL7-1-20130626	2013 06 26	-	1,110	-	-	-	2,500	-	-	< 10a	162	4,850	172	1,350	21	526	< 0.50	19.8	< 20	< 5.0a	120	< 0.10	< 1.0	1.88	< 1.0a	3.5	292	< 0.20	56.7	7.5	< 2.0	< 0.050	3,860	< 0.20	< 30	< 50	-	79.4	< 30	33.3
	GL7-1-20131114	2013 11 14	-	1,140	-	-	-	2,530	-	-	< 10a	160	5,290	179	922	20	509	< 0.50	22.3	< 20	< 5.0a	110	< 0.10	< 1.0	1.38	< 1.0a	< 1.0	263	< 0.20	60.6	7	< 2.0	< 0.050	4,150	< 0.20	< 30	< 50	-	79.5	< 30	89.8
	DUP1-20131114	Duplicate	-	1,130	-	-	-	2,500	-	-	< 10a	159	5,200	179	918	19.8	503	< 0.50	22.6	< 20	< 5.0a	120	< 0.10	< 1.0	1.4	< 1.0a	< 1.0	260	< 0.20	61.3	6.9	< 2.0	< 0.050	4,080	< 0.20	< 30	< 50	-	79.1	< 30	86.7
	QA/QC RPD%		-	1	-	-	-	1	-	-	*	1	2	0	0	1	1	*	1	*	*	9	*	*	1	*	*	1	*	1	1	*	*	2	*	*	*	-	1	*	4
	GL7-1-20140604	2014 06 04	-	1,190	-	-	-	2,560	-	-	< 10a	164	7,030	190	1,130	20.6	502	< 0.50	21.7	< 20	< 5.0a	120	< 0.10	< 1.0	1.83	< 1.0a	< 1.0	342	< 0.20	38.6	7.6	< 2.0	< 0.050	4,190	< 0.20	< 30	< 50	-	62.4	< 30	55.8
GL7-1-20141125	2014 11 25	-	1,110	-	-	-	2,480	-	-	< 10a	144	5,600	183	861	18.8	471	< 0.50	22.8	< 20	< 5.0a	110	< 0.10	< 1.0	1.44	< 1.0a	< 1.0	273	< 0.20	50.4	6.6	< 2.0	< 0.050	4,030	< 0.20	< 30	< 50	-	69.8	< 30	36.1	
GL7-1-20150609	2015 06 09	7.32	1,090	-	-	-	2,430	-	-	< 10	151	7,710	173	963	19.5	478	< 0.50	26.7	< 20	< 5.0a	110	< 0.050	< 0.50	1.72	< 1.0a	1	284	< 0.20	40.7	7.3	< 1.0	< 0.050	4,050	< 0.020	< 30	< 50	-	65.4	< 30	61.6	
GL8-1	GL7-1-20151109	2015 11 09	6.61	1,080	-	-	-	2,470	-	-	< 10	155	3,030	169	904	19.7	464	< 0.50	13	< 20	< 5.0a	< 100	< 0.050	< 0.50	1.33	< 1.0a	< 1.0	291	< 0.20	44.6	7.3	< 1.0	< 0.050	3,840	< 0.020	< 30	< 50	-	65.1	< 30	45.4
	GL8-1-20080529	2008 05 29	-	-	-	-	-	-	-	-	70	93	200	144	625	15.2	832	< 2	6	10	< 1	40	0.7	< 5	< 1	< 10a	2	150	-	40	< 5	< 2	< 0.1	12,300	< 0.5	< 10	52	-	12	3	10
	GL8-1-20081104	2008 11 04	-	-	-	-	-	-	-	-	210	86.9	180	139	494	14.9	746	< 2	5	20	< 1	70	0.1	< 5	1	< 10a	< 1	160	-	40	6	< 2	< 0.1	11,900	< 0.5	< 10	43	-	10	2	10
	GL 8-1-20091110	2009 11 10	-	60	-	-	-	-	-	-	86	20.4	< 100	2.2	421	2.4	19.6	< 2	8	10	< 0.4	40	0.32	< 4	0.8	< 10a	< 1	140	-	40	< 10	< 6	< 0.10	10,800	< 0.1	< 1	92	-	7	< 1	10
	GL8-1-20100810	2010 08 10	-	630	-	-	-	2,710	-	-	158	74	120	109	536	14	622	< 2	3	10	< 0.4	40	< 0.1	< 4	0.4	< 10a	< 1	140	-	44	< 10	< 6	< 0.1	11,200	< 0.1	< 1	< 100	-	11	< 1	< 10
GL8-2	GL8-2-20080529	2008 05 29	-	-	-	-	-	-	-	-	< 50a	63.5	660	316	525	32.2	3,100	< 2	23	20	< 1	130	0.4	9	3	10	2	180	-	160	27	14	< 0.1	7,890	< 0.5	< 10	127	-	172	25	10
	GL30-1-20080529	Duplicate	-	-	-	-	-	-	-	-	< 50a	63.4	620	316	518	32.1	3,120	< 2	23	20	< 1	130	0.4	10	2	10	2	180	-	160	27	15	< 0.1	7,680	< 0.5	< 10	122	-	166	22	< 10
	QA/QC RPD%		-	-	-	-	-	-	-	-	*	0	6	0	1	0	1	*	0	0	*	0	0	11	40	0	0	0	-	0	0	7	*	3	*	*	4	-	4	13	*
	GL8-2-20081104	2008 11 04	-	-	-	-	-	-	-	-	< 50a	40.6	160	309	291	34.6	3,410	< 2	23	30	< 1	200	< 0.10a	63	14	10	< 1	180	-	280	34	9	0.19	7,210	< 0.5	< 10	98	-	152	152	< 10
	GL 8-2-20091110	2009 11 10	-	1,190	-	-	-	-	-	-	< 50a	32.5	190	270	280	34	150	< 2	16	20	< 0.4	170	0.39	26	1.2	< 10a	< 1	140	-	294	30	< 6	< 0.10	5,390	< 0.1	< 1	< 10	-	119	26	110
	GL8-2-20100810	2010 08 10	-	928	-	-	-	8,530	-	-	< 50a	33	340	205	86	30	2,340	< 2	13	20	< 0.4	160	< 0.1	5	0.8	20	< 1	120	-	227	20	10	< 0.1	5,360	< 0.1	< 1	< 100	-	131	28	< 10
	GL8-2-20110627	2011 06 27	-	1,040	-	-	-	7,520	-	-	< 50a	40.9	322	228	406	23	2,320	< 2	7	20	< 0.4	140	0.51	6	2	< 10a	< 1	140	-	191	20	< 6	< 0.1	5,310	< 0.1	< 1	< 10	-	111	10	< 10
	GL8-2-20111217	2011 12 17	-	652	-	-	-	7,360	-	-	< 50a	26.4	74	142	110	19.8	2,120	< 2	13	20	< 0.4	150	0.58	18	0.4	20	< 1	130	-	300	20	< 6	< 0.10	4,460	0.43	< 1	< 10	-	134	20	< 10
	GL 8-2-20120626	2012 06 26	-	800	-	-	-																																		

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																														
			pH	Total Hardness mg/L	pH (field)	Conductivity μS/cm	Field Conductivity μS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum μg/L	Dissolved Calcium μg/L	Dissolved Iron μg/L	Dissolved Magnesium mg/L	Dissolved Manganese mg/L	Dissolved Potassium mg/L	Dissolved Sodium μg/L	Antimony μg/L	Arsenic μg/L	Barium μg/L	Beryllium μg/L	Boron μg/L	Cadmium μg/L	Chromium μg/L	Cobalt μg/L	Copper μg/L	Lead μg/L	Lithium μg/L	Mercury μg/L	Molybdenum μg/L	Nickel μg/L	Selenium μg/L	Silver μg/L	Strontium μg/L	Thallium μg/L	Tin μg/L	Titanium μg/L	Tungsten μg/L	Uranium μg/L	Vanadium μg/L	Zinc μg/L		
GL9-1 (Cont'd)	GL9-1-20130626	2013 06 26	-	418	-	-	-	-	1,260	-	-	< 10a	19.7	1,380	89.5	70	14.1	346	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.10	< 1.0	< 0.50	< 1.0a	< 1.0	129	< 0.20	< 1.0	< 5.0	< 2.0	< 0.050	730	< 0.20	< 30	< 50	-	0.65	< 30	< 5.0	
	GL9-1-20131114	2013 11 14	-	410	-	-	-	-	1,230	-	-	< 10a	12.5	471	91.9	32	14.1	353	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.10	< 1.0	< 0.50	< 1.0a	< 1.0	127	< 0.20	< 1.0	< 5.0	< 2.0	< 0.050	464	< 0.20	< 30	< 50	-	0.31	< 30	< 5.0	
	GL9-1-20140604	2014 06 04	-	374	-	-	-	-	1,190	-	-	< 10a	9.15	191	85.3	25	13.9	348	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.10	< 1.0	< 0.50	< 1.0a	< 1.0	117	< 0.20	< 1.0	< 5.0	< 2.0	< 0.050	356	< 0.20	< 30	< 50	-	0.76	< 30	< 5.0	
	DUP1-20140604	Duplicate	-	366	-	-	-	-	1,190	-	-	< 10a	9.21	184	83.4	24	13.5	342	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.10	< 1.0	< 0.50	< 1.0a	< 1.0	117	< 0.20	< 1.0	< 5.0	< 2.0	< 0.050	356	< 0.20	< 30	< 50	-	0.25	< 30	< 5.0	
	QA/QC RPD%		-	2	-	-	-	-	0	-	-	*	1	4	2	4	3	2	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.10	< 1.0	< 0.50	< 1.0a	*	126	*	< 1.0	< 5.0	< 2.0	< 0.050	0	< 0.20	< 30	< 50	-	101	*	*	
	GL9-1-20141125	2014 11 25	-	404	-	-	-	-	1,310	-	-	< 10a	12.8	60	90.3	15	13.8	348	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.10	< 1.0	< 0.50	< 1.0a	< 1.0	120	< 0.20	< 1.0	< 5.0	< 2.0	< 0.050	572	< 0.20	< 30	< 50	-	< 0.20	< 30	< 5.0	
	GL9-1-20150609	2015 06 09	8.9	332	-	-	-	-	1,140	-	-	< 10	7.76	80	75.9	19	12.9	332	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	101	< 0.20	1.2	< 5.0	< 1.0	< 0.050	316	< 0.020	< 30	< 50	-	< 0.20	< 30	< 5.0	
	GL9-1-20151109	2015 11 09	8.97	326	-	-	-	-	1,220	-	-	< 10	8.97	103	73.7	25	12.9	313	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	98	< 0.20	1.7	< 5.0	< 1.0	< 0.050	372	< 0.020	< 30	< 50	-	0.41	< 30	< 5.0	
	GL9-1-20170530	2017 05 30	8.9	363	-	-	-	-	1,150	-	-	< 10	9.1	127	82.7	27	13.7	359	< 0.50	< 1.0	< 20	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	112	< 0.20	2	< 5.0	< 1.0	< 0.050	357	< 0.020	< 30	< 50	-	0.3	< 30	< 5.0	
	GL9-1-180604	2018 06 04	8.03	480	7.21	-	-	2,027	1,390	2.53	< 0.0050	< 5.0	49.8	253	86.3	104	13.8	340	< 0.20	0.80	7.7	< 0.10	44.3	< 0.010	< 0.50	< 0.10	< 0.40a	< 0.20	114	< 0.010	2.04	< 0.40	< 0.50	< 0.050	2,090	< 0.020	< 0.20	< 5.0	< 1.0	1.38	< 1.0	17.6	
	GL9-1-190530	2019 05 30	8.33	407	8.25	-	-	1,961	1,330	1.44	< 0.0050	9.0	28.2	54	81.8	20.5	13.4	336	< 0.20	< 0.50	7.8	< 0.10	38.8	< 0.010	0.77	< 0.10	< 0.40a	< 0.20	130	< 0.010	0.37	< 0.40	< 0.50	< 0.050	1,430	< 0.020	< 0.20	< 5.0	< 1.0	0.225	< 1.0	< 4.0	
	GL9-1-200611	2020 06 11	7.90	584	7.06	-	-	2,032	1,470	1.77	-	< 1.0	100	19,300	80.9	411	14.8	323	< 0.050	0.238	28.6	0.070	36.3	0.0022	0.11	0.116	< 0.10	< 0.050	126	< 0.010	0.743	0.166	< 0.10	< 0.010	5,030	< 0.0040	< 0.050	< 0.20	< 0.20	1.96	0.23	< 1.0	
	DUPC-200611	Duplicate	7.86	570	-	-	-	-	1,450	1.26	-	< 1.0	98.1	18,800	78.8	400	14.4	313	< 0.050	0.187	27.9	0.068	34.8	0.0131	0.12	0.120	< 0.10	< 0.050	128	< 0.010	0.726	0.152	< 0.10	< 0.010	5,110	< 0.0040	< 0.050	< 0.20	< 0.20	1.97	0.21	1.2	
	QA/QC RPD%		-	1	-	-	-	-	1	*	*	*	2	3	3	3	3	2	< 0.050	0.160	27.3	0.250	51.1	< 0.0020	< 0.10	0.0096	< 0.10	< 0.050	219	< 0.010	0.621	0.221	< 0.10	< 0.010	5,250	< 0.0040	< 0.050	0.28	< 0.20	2.63	< 0.20	< 1.0	
	GL9-1-210611	2021 06 11	7.75	746	6.79	-	-	-	-	-	-	1.0	128	814	103	303	17.7	418	< 0.050	0.160	27.3	0.250	51.1	< 0.0020	< 0.10	0.0096	< 0.10	< 0.050	219	< 0.010	0.621	0.063	< 0.10	< 0.010	5,350	< 0.0040	< 0.050	0.28	< 0.20	2.63	< 0.20	< 1.0	
	GL9-2-20080529	2008 05 29	-	-	-	-	-	-	-	-	-	< 50a	294	< 10	1,760	313	84.2	9,840	< 2	17	< 10	< 1	< 20	0.3	< 5	4	50	2	90	-	80	< 5	11	< 0.10	11,200	< 0.5	< 10	814	-	987	4	30	
	GL9-2-20081104	2008 11 04	-	-	-	-	-	-	-	-	-	60	290	1,480	1,740	289	79.3	9,950	< 2	21	< 10	< 1	< 20	< 0.1a	10	2	30	< 1	80	-	90	23	5	< 0.1	11,000	< 0.5	< 10	603	-	950	4	40	
	GL 9-2-20091111	2009 11 11	-	9,260	-	-	-	-	-	-	-	659	79.5	2,670	2,200	473	110	12,400	< 2	16	< 10	< 0.4	< 40	0.14	4	2.3	< 10a	< 1	80	-	88	20	8	< 0.10	12,000	< 0.1	< 1	< 10	-	1,100	2	30	
	GL 9-2-20120627	2012 06 27	-	8,200	-	-	-	-	-	-	-	960	408	140	1,800	370	91	9,800	< 2	6	10	< 0.4	< 40	0.2	6	1.2	20	< 1	60	-	100	10	20	< 0.10	12,200	< 0.1	< 1	< 100	-	542	2	10	
	GL9-2-20100810	2010 08 10	-	6,980	-	-	-	-	-	-	-	144	345	2,170	1,490	500	104	9,940	< 2	18	< 10	< 0.4	< 40	< 0.1	4	2.8	10	< 1	60	-	93	20	11	< 0.1	12,000	< 0.1	< 1	< 100	-	874	3	20	
GL9-2-20110628	2011 06 28	-	8,320	-	-	-	-	-	-	-	< 5	398	296	1,780	296	85	9,780	< 0.2	4.1	12	< 0.04	< 4	0.3	1.3	257	18	< 0.1	50	-	101	14	24.4	< 0.01	11,300	< 0.01	< 0.1	< 10	-	794	1.2	13		
GL9-2-20121204	2012 12 04	-	8,370	-	-	-	-	-	-	-	< 50a	394	365	1,800	407	66.3	10,400	< 2.0	6.2	10	< 0.40	< 40	0.34	9	2.95	10	< 1.0	80	-	108	10	18.5	< 0.10	12,600	< 0.10	< 1.0	< 100	-	621	3.37	< 10		
Dup-B-20121204	Duplicate	-	7,980	-	-	-	-	-	-	-	< 50a	399	318	1,700	416	64.6	9,660	< 2.0	5.3	10	< 0.40	< 40	0.36	8.3	1.16	20	< 1.0	60	-	108	10	15.6	< 0.10	12,300	< 0.10	< 1.0	< 100	-	644	2.78	10		
QA/QC RPD%		-	5	-	-	-	-	-	1	-	*	*	14	6	2	3	7	*	16	0	*	*	6	8	87	67	*	29	-	0	0	17	*	2	*	*	*	*	*	4	19	*	
GL9-2-20130626	2013 06 26	-	7,670	-	-	-	-	-	-	-	< 150a	378	860	1,630	440	79	9,960	< 5.0	< 5.0	< 200	< 100a	< 2,000a	< 2.5a	< 25a	< 5.0	< 25a	< 2.5	< 200	< 0.20	104	< 25	< 50a	< 0.50	9,840	< 5.0a	< 600	< 200	-	578	< 600a	< 100		
DUP2-20130626	Duplicate	-	7,870	-	-	-	-	-	-	-	< 150a	387	880	1,680	450	81	9,650	< 5.0	< 5.0	< 200	< 100a	< 2,000a	< 2.5a	< 25a	< 5.0	< 25a	< 2.5	< 200	< 0.20	93.8	< 25	< 50a	< 0.50	10,100	< 5.0a	< 600	< 200	-	507	< 600a	< 100		
QA/QC RPD%		-	3	-	-	-	-	-	3	-	*	2	2	3	2	2	3	*	*	*	*	*	*	6	8	87	67	*	29	-	0	0	17	*	2	*	*	*	*	*	4	19	*
GL9-2-20131113	2013 11 13	-	7,950	-	-	-	-	-	-	-	< 150a	406	980	1,680	590	82	9,970	< 5.0	< 5.0	< 100	< 50a	< 1,000a	< 2.5a	< 25a	< 5.0	< 25a	< 2.5	130	< 0.20	99.5	< 25	< 50a	< 0.50	10,000	< 5.0a	< 300	< 100	-	598	< 300a	< 50		
GL9-2-20140605	2014 06 05	-	8,100	-	-	-	-	-	-	-	< 150a	412	< 600a	1,720	380	84	10,300	< 5.0	< 5.0	< 200	< 100a	< 2,000a	< 2.5a	< 25a	< 5.0	< 25a	< 2.5	< 200	< 0.20	89.6	< 25	< 50a	< 0.50	11,200	< 5.0a	< 600	< 200	-	536	< 600a	< 100		
GL9-2-20141125	2014 11 25	-	7,700	-	-	-	-	-	-	-	< 150a	396	450	1,630	381	80	9,660	< 5.0	< 5.0	< 100	< 50a	< 1,000a	< 2.5a	< 25a	< 5.0	< 25a	4.2	< 100	< 0.20	92.1	< 25	< 50a	< 0.50	10,200	< 5.0a	< 300	< 100	-	478	< 300a	< 50		
GL9-2-20150609	2015 06 09	8.05	7,650	-	-	-	-	-	-	-	< 50	404	570	1,610	134	75	9,660	< 5.0	< 5.0	< 100	< 50a	< 1,000a	1.07	< 5.0	< 5.0	< 10a	< 2.5	< 100	< 0.20	96.7	< 25	< 2.5	< 50a	< 0.50	10,300	< 5.0a	< 300	< 100	-	483	< 300a	< 50	
GL9-2-20151104	2015 11 04	7.92	7,360	-	-	-	-	-	-	-																																	

Associated Exova file(s): 622178, 653600, 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 846260, 878316, 879073, 909346, 909448, 909654.

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

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

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

RDL Denotes reported detection limit.

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters											Dissolved Metals																												
			pH	Total Hardness mg/L	pH (field)	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum µg/L	Dissolved Calcium µg/L	Dissolved Iron µg/L	Dissolved Magnesium mg/L	Dissolved Manganese mg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Boron µg/L	Cadmium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Lead µg/L	Lithium µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L	
GL9-3 (Cont'd)	GL9-3-20160526	2016 05 26	7.78	10,600	-	-	-	62,800	-	-	< 50	385	< 600a	2,350	< 100	118	11,900	< 5.0	< 5.0	< 200	< 100a	< 2,000a	< 0.25	< 5.0	< 5.0	< 10a	< 2.5	< 200	< 0.20	75.9	< 25	< 2.5	< 0.50	11,200	< 0.50	< 600	< 200	-	1,410	< 600a	< 100	
	GL9-3-20170529	2017 05 29	7.9	11,100	-	-	-	46,400	-	-	< 50	377	< 600a	2,470	140	121	12,800	< 5.0	5.1	< 200	< 100a	< 2,000a	< 0.25	< 5.0	< 5.0	16	< 2.5	< 200	< 0.20	116	< 25	< 2.5	< 0.50	10,700	< 0.50	< 600	< 200	-	1,430	< 600a	< 100	
	GL9-3-180528	2018 05 28	7.68	11,300	7.22	-	3,210	53,000	25.1	< 0.0050	< 5.0	445	12	2,480	271	165	12,600	< 0.20	0.89	14.8	< 0.10	8.8	0.302	< 0.50	0.90	2.87	< 0.20	89.6	< 0.010	98.4	5.90	1.39	< 0.050	15,300	0.440	< 0.20	< 5.0	1.0	1,680	< 1.0	< 4.0	
	GL9-3-190527	2019 05 27	7.73	12,600	7.54	-	44350	52,300	24.8	< 0.500	13.7	516	16	2,760	153	167	13,900	< 0.20	1.16	14.9	< 0.10	8.7	0.212	1.37	0.64	4.83	< 0.20	139	< 0.010	112	5.29	1.24	< 0.050	12,900	0.429	< 0.20	< 5.0	< 1.0	1,620	< 1.0	< 4.0	
	GL9-3-200608	2020 06 08	7.80	10,200	7.32	-	36,600	52,600	23.6	-	159	430	19.3	2,230	217	238	12,900	0.150	1.19	15.8	0.021	11.2	0.145	1.31	1.07	3.44	< 0.050	135	< 0.010	110	6.26	1.94	0.016	13,000	0.409	< 0.050	0.83	0.50	1,780	1.05	1.5	
GL10-1	GL9-3-210610	2021 06 10	7.74	10,700	7.29	-	-	-	-	3.3	427	2.0	2,350	137	132	12,100	0.145	0.746	10.7	< 0.010	10.2	0.133	0.21	0.750	2.30	< 0.050	116	< 0.010	91.3	4.96	0.49	0.012	11,800	0.370	< 0.050	< 0.20	0.39	1,430	< 0.20	1.4		
	GL10-1-20091112	2009 11 12	-	7,010	-	-	-	-	-	-	< 50a	190	460	1,590	1,820	46	7,710	< 2	17	20	< 0.4	< 40	0.23	< 4	4.2	< 10a	< 1	400	-	98	50	7	< 0.1	17,400	0.6	< 1	< 10	-	2,540	3	10	
	GL10-1-20100810	2010 08 10	-	6,430	-	-	-	31,200	-	-	< 50a	198	480	1,440	2,120	57	7,660	< 2	32	20	< 0.4	< 40	< 0.1	6	5	20	< 1	310	-	91	60	12	0.26	19,200	0.21	< 1	< 100	-	2,190	6	10	
	GL10-1-20110704	2011 07 04	-	8,310	-	-	-	31,700	-	-	< 5	215	558	1,890	1,830	46	7,700	< 0.2	1.1	19	< 0.04	22	0.12	107	5.3	11	< 0.1	310	-	82.3	56	88.9	0.1	18,600	0.23	< 0.1	< 10	-	2,470	31.8	9	
	GL10-1-20120626	2012 06 26	-	8,760	-	-	-	33,800	-	-	< 50a	259	1,150	1,970	1,940	46	7,670	< 2	10	20	< 0.4	< 40	< 0.1	14	4.9	10	< 1	350	-	71	60	24	< 0.10	20,300	0.22	< 1	< 100	-	2,230	6	20	
	GL10-1-20121204	2012 12 04	-	8,350	-	-	-	33,000	-	-	< 50a	231	247	1,890	1,760	38.4	7,800	< 2	9.6	10	< 0.40	< 40	< 0.10	19.9	9.25	10	< 1.0	270	-	76.2	50	29.6	< 0.10	19,500	0.3	< 1.0	< 100	-	2,490	7.07	< 10	
	GL10-1-20130626	2013 06 26	-	7,720	-	-	-	31,400	-	-	< 150a	250	1,050	1,720	1,810	44	7,920	< 5.0	< 5.0	< 100	< 50a	< 1,000a	< 2.5a	< 25a	< 5.0	< 25a	< 2.5	360	< 0.20	61.5	35	< 50a	< 0.50	15,200	< 5.0a	< 300	< 100	-	1,930	< 300a	< 50	
	GL10-1-20140605	2014 06 05	-	6,550	-	-	-	28,900	-	-	< 150a	214	710	1,460	1,530	39	6,440	< 5.0	< 5.0	< 100	< 50a	< 1,000a	< 2.5a	< 25a	< 5.0	< 25a	< 2.5	310	< 0.20	66.8	39	< 50a	< 0.50	13,600	< 5.0a	< 300	< 100	-	1,770	< 300a	< 50	
	GL10-1-20141125	2014 11 25	-	6,570	-	-	-	28,000	-	-	< 150a	217	1,450	1,460	1,540	40	6,460	< 5.0	< 5.0	< 100	< 50a	< 1,000a	< 2.5a	< 25a	< 5.0	< 25a	< 2.5	320	< 0.20	66.4	26	< 50a	< 0.50	13,600	< 5.0a	< 300	< 100	-	1,640	< 300a	< 50	
	GL10-1-20150610	2015 06 10	7.95	6,240	-	-	-	26,600	-	-	< 50	231	1,330	1,380	1,450	35	5,830	< 5.0	< 5.0	< 100	< 50a	< 1,000a	< 0.25	< 5.0	< 5.0	< 10a	< 2.5	290	< 0.20	64.3	28	< 2.5	< 0.50	14,100	< 0.50	< 300	< 100	-	1,660	< 300a	< 50	
	GL10-1-20151109	2015 11 09	7.57	5,980	-	-	-	25,100	-	-	< 20	228	< 300	1,310	1,370	36	5,530	< 2.0	< 2.0	< 100	< 50a	< 1,000a	< 0.10	< 2.0	3	4.1	< 1.0	290	< 0.20	67.2	25	< 1.0	< 0.20	13,300	< 0.20	< 300	< 100	-	1,660	< 300a	< 50	
	DUP2-20151109	Duplicate	7.64	5,800	-	-	-	25,200	-	-	< 20	225	< 300	1,270	1,350	36	5,470	< 2.0	< 2.0	< 100	< 50a	< 1,000a	< 0.10	< 2.0	2.8	< 4.0a	< 1.0	280	< 0.20	61.1	24	< 1.0	< 0.20	13,200	< 0.20	< 300	< 100	-	1,540	< 300a	< 50	
	QA/QC RPD%		1	3	-	-	-	0	-	-	*	1	*	3	1	0	*	*	*	*	*	*	*	7	*	4	*	10	4	*	10	4	*	1	*	*	*	-	8	*	*	
	GL12-1	GL 12-1-20111218	2011 12 18	-	3,160	-	-	-	8,050	-	-	< 50a	420	< 5	513	466	17.6	863	7	2	10	< 0.4	50	0.4	6	0.9	30	< 1	160	-	30	30	< 6	< 0.10	13,600	0.62	2	< 10	-	272	< 1	< 10
		GL12-1-20091112	2009 11 12	-	3,250	-	-	-	-	-	77	411	140	540	19	18.6	883	< 2	< 2	< 10	< 0.4	< 40	0.1	< 4	0.7	10	< 1	130	-	16	10	< 6	< 0.10	11,300	0.13	< 1	< 10	-	250	< 1	10	
GL12-1-20100811		2010 08 11	-	3,080	-	-	-	7,420	-	-	< 50a	400	140	504	68	17	896	< 2	< 2	< 10	< 0.4	< 40	< 0.1	< 4	0.9	< 10a	< 1	120	-	18	20	< 6	< 0.1	11,700	0.13	< 1	< 100	-	206	< 1	< 10	
GL12-1-20110629		2011 06 29	-	3,310	-	-	-	7,330	-	-	< 5	435	13	541	< 1	17.9	870	0.6	< 0.2	10	< 0.04	8	0.12	3.2	0.84	8	< 0.1	123	-	24.2	14	18.1	< 0.01	11,200	0.09	< 0.1	< 10	-	205	1.3	4	
GL30-1-20110629		Duplicate	-	3,400	-	-	-	7,270	-	-	< 5	445	5	557	< 1	17.4	892	0.4	0.2	9	< 0.04	8	0.12	3.4	0.69	9	< 0.1	111	-	20.7	12	17.1	< 0.01	11,100	0.07	< 0.1	< 10	-	206	1.4	4	
QA/QC RPD%			-	3	-	-	-	1	-	-	*	2	*	3	3	2	*	*	*	11	*	*	0	6	20	12	*	10	-	16	15	6	*	1	25	*	*	-	0	7	0	
GL12-1-20120625		2012 06 25	-	3,520	-	-	-	7,750	-	-	< 50a	473	640	569	790	21	952	< 2	< 2	10	< 0.4	< 40	0.15	< 4	1.6	20	< 1	140	-	23	20	< 6	< 0.10	12,900	0.19	< 1	< 100	-	210	1	10	
GL12-1-20121204		2012 12 04	-	3,610	-	-	-	7,920	-	-	< 50a	472	< 5	591	778	19.2	1,010	< 2.0	< 2.0	10	< 0.40	< 40	0.33	6.8	2.43	20	< 1.0	140	-	27.6	20	< 6.0	< 0.10	13,300	0.3	< 1.0	< 10	-	272	2.51	< 10	
GL12-1-20130626		2013 06 26	-	3,720	-	-	-	8,440	-	-	< 15a	472	< 60	616	549	23.5	1,130	< 0.50	< 1.0	< 20	< 10a	< 200	0.31	< 2.5	0.51	16.8	<															

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																												
			pH	Total Hardness mg/L	pH (field)	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum µg/L	Dissolved Calcium mg/L	Dissolved Iron µg/L	Dissolved Magnesium mg/L	Dissolved Manganese µg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Boron µg/L	Cadmium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Lead µg/L	Lithium µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L
GL13-1 (Cont'd)	GL13-1-20111217	2011 12 17	-	3,500	-	-	-	10,900	-	-	< 50a	292	< 5	673	46	19	1,610	< 2	4	< 10	< 0.4	< 40	0.12	7	0.4	10	< 1	120	-	55	20	< 6	< 0.10	9,590	0.43	< 1	< 10	-	193	4	< 10
	DUPC-20111217	Duplicate	-	113	-	-	-	1,570	-	-	< 50a	19.2	453	15.8	83	11.8	555	< 2	4	220	< 0.4	70	< 0.1	10	0.2	< 10a	< 1	250	-	< 1	< 10	< 6	< 0.10	4,020	0.31	< 1	< 10	-	< 4	4	< 10
	QA/QC RPD%		-	187	-	-	-	150	-	-	*	175	*	191	57	47	97	*	*	*	*	*	*	35	*	*	*	*	70	-	*	*	*	*	82	32	*	*	-	*	0
GL14-1	GL13-1-20120625	2012 06 25	-	3,580	-	-	-	9,930	-	-	< 50a	305	< 50	684	520	20	1,670	< 2	< 2	< 10	< 0.4	< 40	0.2	< 4	0.7	< 10a	< 1	80	-	50	10	9	< 0.10	8,250	< 0.1	< 1	< 100	-	124	1	10
	GL13-1-20121204	2012 12 04	-	3,440	-	-	-	9,990	-	-	< 50a	284	< 50	664	23	18.3	1,660	< 2	< 2.0	< 10	< 0.40	< 40	< 0.10	7.6	8.8	10	< 1.0	60	-	45.8	< 10	7.3	< 0.10	8,720	< 0.10	< 1.0	< 100	-	194	2.72	< 10
	GL14-1-20091116	2009 11 16	-	40	-	-	-	-	-	-	535	5.8	490	6.2	42	1.1	381	< 2	3	20	< 0.4	190	< 0.1	< 4	0.5	< 10a	< 1	140	-	9	< 10	< 6	< 0.10	1,470	< 0.1	< 1	< 10	-	< 4	8	20
	GL14-1-20100811	2010 08 11	-	40	-	-	-	1,120	-	-	146	5	150	6	32	3	399	< 2	3	20	< 0.4	200	< 0.10	< 4	0.4	< 10a	< 1	130	-	9	< 10	< 6	< 0.1	1,470	< 0.1	< 1	< 100	-	< 4	9	< 10
	GL14-1-20110704	2011 07 04	-	48	-	-	-	1,100	-	-	87	7.3	72	7.2	41	1.6	413	< 0.2	2.2	19	< 0.04	185	0.02	16.9	0.36	2	< 0.1	121	-	8.2	< 1	19	< 0.01	1,390	< 0.01	< 0.1	< 10	-	1.3	9.4	2
	GL14-1-20120627	2012 06 27	-	40	-	-	-	-	-	-	< 50a	6	330	6	< 10	< 1	424	< 2	< 2	20	< 0.4	200	< 0.1	4	< 0.2	< 10a	< 1	130	-	5	< 10	< 6	< 0.10	1,490	< 0.1	< 1	< 100	-	< 4	5	< 10
	GL14-1-20120704	2012 07 04	-	-	-	-	-	1,120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
GL15-1	GL14-1-20121204	2012 12 04	-	35	-	-	-	1,190	-	-	659	5.36	483	5.35	26	1.1	418	< 2.0	< 2.0	20	< 0.40	210	< 0.10a	6.7	9.04	< 10a	< 1.0	110	-	8.44	< 10	< 6.0	< 0.10	1,510	< 0.10	< 1.0	36	-	< 4.0	7.42	< 10
	GL15-1-20091117	2009 11 17	-	702	-	-	-	-	-	-	< 50a	101	< 100	109	21	2.9	163	< 2	< 2	70	< 0.4	< 40	0.2	< 4	0.4	< 10a	< 1	20	-	6	< 10	< 6	< 0.10	5,710	< 0.1	< 1	< 10	-	31	2	< 10
	GL30-3-20091117	Duplicate	-	662	-	-	-	-	-	-	< 50a	94.5	< 100	104	20	2.5	157	< 2	< 2	60	< 0.4	< 40	< 0.1	< 4	0.4	20	< 1	20	-	6	< 10	< 6	< 0.10	5,710	< 0.1	< 1	< 10	-	30	2	10
	QA/QC RPD%		-	6	-	-	-	-	-	-	*	7	*	5	5	4	*	*	*	15	*	*	*	*	*	*	*	*	0	-	0	*	*	*	0	*	*	-	3	0	*
	GL15-1-20140604	2014 06 04	-	335	-	-	-	782	-	-	< 10a	31.9	< 30	62.1	67	< 2.0	178	< 0.50	< 1.0	29	< 5.0a	< 100	< 0.339	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	5.7	< 5.0	< 1.0	< 0.050	3,260	< 0.20	< 30	< 50	-	5.16	< 30	< 5.0
	GL15-1-20141117	2014 11 17	-	340	-	-	-	793	-	-	< 10a	32.3	< 30	63.1	148	< 2.0	178	< 0.50	< 1.0	31	< 5.0a	< 100	< 0.050	< 0.50	0.5	< 1.0a	< 1.0	< 50	< 0.20	6	< 5.0	< 1.0	< 0.050	3,440	< 0.20	< 30	< 50	-	5.76	< 30	< 5.0
	GL15-1-20150610	2015 06 10	8.32	339	-	-	-	959	-	-	< 10	32.7	< 30	62.4	88	< 2.0	191	< 0.50	< 1.0	28	< 5.0a	< 100	0.136	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	5.6	< 5.0	< 1.0	< 0.050	3,550	< 0.010	< 30	< 50	-	5.13	< 30	< 5.0
	DUP4-20150610	Duplicate	8.3	326	-	-	-	804	-	-	< 10	32.4	< 30	59.7	85	< 2.0	188	< 0.50	< 1.0	28	< 5.0a	< 100	0.141	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	5.9	< 5.0	< 1.0	< 0.050	3,540	< 0.010	< 30	< 50	-	5.23	< 30	< 5.0
	QA/QC RPD%		0	4	-	-	-	18	-	-	*	1	*	4	3	2	*	*	*	0	*	*	4	*	*	*	*	*	*	5	*	*	*	0	*	*	-	2	*	*	
	GL15-1-20151103	2015 11 03	8.12	336	-	-	-	814	-	-	< 10	32.8	73	61.7	210	< 2.0	189	< 0.50	< 1.0	32	< 5.0a	< 100	< 0.050	< 0.50	1.69	< 1.0a	< 1.0	< 50	< 0.20	5.8	< 5.0	< 1.0	< 0.050	3,700	< 0.010	< 30	< 50	-	5.66	< 30	< 5.0
	GL15-1-20160920	2016 09 20	8.01	385	-	-	-	874	-	-	< 10	36.3	< 30	71.3	24	< 2.0	182	< 0.50	< 1.0	36	< 5.0a	< 100	0.363	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	5.9	< 5.0	< 1.0	< 0.050	3,850	0.012	< 30	< 50	-	6.74	< 30	< 5.0
	GL15-1-20170925	2017 09 25	8.1	326	-	-	-	767	-	-	< 10	31.9	< 30	59.8	20	< 2.0	175	< 0.50	< 1.0	28	< 5.0a	< 100	0.141	< 0.50	< 0.50	< 1.0a	< 1.0	< 50	< 0.20	5.4	< 5.0	< 1.0	< 0.050	3,480	< 0.010	< 30	< 50	-	5.97	< 30	< 5.0
	GL15-1-180928	2018 09 28	7.87	333	7.47	-	1,320	819	1.75	< 0.0050	5.8	31.3	< 10	61.8	32.8	1.44	177	< 0.20	< 0.50	27.6	< 0.10	9.0	0.038	< 0.50	< 0.10	< 0.40a	< 0.20	17.8	< 0.010	5.71	< 0.40	< 0.50	< 0.050	3,470	< 0.020	< 0.20	< 5.0	< 1.0	5.67	< 1.0	< 4.0
	GL15-1-190924	2019 09 24	8.09	327	7.35	-	1,259	826	1.68	-	< 5.0	31.0	< 10	60.6	45.2	1.55	173	< 0.20	< 0.50	30.5	< 0.10	14.0	0.020	< 0.50	< 0.10	0.14	< 0.20	17.8	< 0.010	6.18	0.63	< 0.50	< 0.050	3,690	< 0.020	< 0.20	< 5.0	< 1.0	6.04	1.0	< 4.0
	GL15-1-2011104	2020 11 04	7.80	1,530	7.18	-	3,904	3,210	10.8	-	< 1.0	220	5.9	238	52.1	5.5	437	0.261	0.633	136	< 0.010	16.1	0.528	0.37	0.526	4.01	< 0.050	32.5	< 0.010	10.2	4.73	19.9	< 0.010	12,900	0.0152	< 0.050	< 0.20	< 0.20	95.8	5.75	2.2
	GL15-2	GL15-1-211007	2021 10 07	8.08	468	7.47	-	-	-	-	4.8	45.3	2.5	86	0.375	2.12	212	0.107	0.443	40.8	< 0.010	9.6	0.0891	0.23	0.0243	2.84	0.051	15.4	< 0.010	7.52	1.03	1.53	< 0.010	4,920	0.0073	0.070	< 0.20	< 0.20	13.6	1.32	2.1
GL15-2-20110704		2011 07 04	-	2,090	-	-	-	3,760	-	-	< 5	261	10	350	< 1	10	406	< 0.2	1.3	18	< 0.04	17	0.15	17.8	0.67	5	< 0.1	39	-	11.7	23	49.8	< 0.01	7,230	0.03	< 0.1	< 10	-	149	5.9	6
GL15-2-20120627		2012 06 27	-	3,300	-	-	-	6,180	-	-	< 50a	397	400	562	< 10	10	590	< 2	< 2	20	< 0.4	< 40																			

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																														
			pH	Total Hardness mg/L	pH (field)	Conductivity μS/cm	Field Conductivity μS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum μg/L	Dissolved Calcium mg/L	Dissolved Iron μg/L	Dissolved Magnesium mg/L	Dissolved Manganese μg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony μg/L	Arsenic μg/L	Barium μg/L	Beryllium μg/L	Boron μg/L	Cadmium μg/L	Chromium μg/L	Cobalt μg/L	Copper μg/L	Lead μg/L	Lithium μg/L	Mercury μg/L	Molybdenum μg/L	Nickel μg/L	Selenium μg/L	Silver μg/L	Strontium μg/L	Thallium μg/L	Tin μg/L	Titanium μg/L	Tungsten μg/L	Uranium μg/L	Vanadium μg/L	Zinc μg/L		
GL16-1 (Cont'd)	GL16-1-20131113	2013 11 13	-	949	-	-	-	-	4,160	104	91	168	90	19.9	945	≤ 0.50	7.1	≤ 20	≤ 5.0a	≤ 100	≤ 0.25	≤ 2.5	≤ 0.50	≤ 2.5a	≤ 1.0	256	≤ 0.20	15.2	12.7	≤ 5.0	≤ 0.050	15,800	≤ 0.50	≤ 30	≤ 50	-	-	10	≤ 30	≤ 5.0			
	GL16-1-20140605	2014 06 05	-	930	-	-	-	-	3,880	108	860	160	767	19.5	972	≤ 0.50	12.2	≤ 20	≤ 10a	≤ 200	≤ 0.25	≤ 2.5	1.14	≤ 2.5a	≤ 1.0	266	≤ 0.20	13.2	≤ 5.0	≤ 5.0	≤ 0.050	17,200	≤ 0.50	≤ 60	≤ 50	-	-	8.43	≤ 60	≤ 10			
	GL16-1-20141118	2014 11 18	-	845	-	-	-	-	3,830	149	277	19.5	950	≤ 0.50	8.7	≤ 20	≤ 2.5	≤ 5.0a	≤ 100	≤ 0.25	≤ 2.5	≤ 0.50	≤ 2.5a	≤ 1.0	268	≤ 0.20	15.5	≤ 5.0	≤ 5.0	≤ 0.050	15,900	≤ 0.50	≤ 30	≤ 50	-	-	9.17	≤ 30	≤ 5.0				
	GL16-1-20150610	2015 06 10	7.96	900	-	-	-	-	3,880	≤ 10	106	1,020	154	819	19.1	933	≤ 0.50	14.4	≤ 20	≤ 10a	≤ 200	0.101	≤ 0.50	1.24	≤ 1.0a	≤ 1.0	260	≤ 0.20	14.4	≤ 5.0	≤ 1.0	≤ 0.050	16,600	≤ 0.050	≤ 60	≤ 50	-	-	9.18	≤ 60	≤ 10		
	GL16-1-20151103	2015 11 03	7.76	827	-	-	-	-	3,670	≤ 10	95.4	≤ 30	143	60	18.7	997	≤ 0.50	7.1	≤ 20	≤ 5.0a	≤ 100	1.64	≤ 0.50	≤ 0.50	1.3	≤ 1.0	256	≤ 0.20	15.1	≤ 5.0	≤ 1.0	≤ 0.050	16,400	≤ 0.050	≤ 30	≤ 50	-	-	8.66	≤ 30	≤ 5.0		
	DUP3-20151103	Duplicate	7.64	828	-	-	-	-	3,630	≤ 10	95.8	≤ 30	143	60	18.7	993	≤ 0.50	6.5	≤ 20	≤ 5.0a	≤ 100	1.61	≤ 0.50	≤ 0.50	1.1	≤ 1.0	254	≤ 0.20	14.2	≤ 5.0	≤ 1.0	≤ 0.050	16,200	≤ 0.050	≤ 30	≤ 50	-	-	8.1	≤ 30	≤ 5.0		
	QA/QC RPD%		2	0	-	-	-	-	1	-	0	*	0	0	0	0	*	9	*	*	*	2	*	*	17	*	1	*	6	*	*	*	1	*	*	*	-	-	7	*	*		
	GL16-1-20160524	2016 05 24	7.84	803	-	-	-	-	3,470	≤ 10	90.1	≤ 30	140	≤ 10	18.7	943	≤ 0.50	7.5	≤ 20	≤ 5.0a	≤ 100	0.508	≤ 0.50	≤ 0.50	≤ 1.0a	≤ 1.0	250	≤ 0.20	15.5	≤ 5.0	≤ 1.0	≤ 0.050	15,200	≤ 0.050	≤ 30	≤ 50	-	-	8.88	≤ 30	≤ 5.0		
	GL16-1-20170525	2017 05 25	8.51	833	-	-	-	-	3,530	≤ 10	92.8	≤ 30	146	≤ 10	19.7	952	≤ 0.50	7.5	≤ 20	≤ 5.0a	≤ 100	0.418	≤ 0.50	≤ 0.50	≤ 1.0a	≤ 1.0	276	≤ 0.20	14.6	≤ 5.0	≤ 1.0	≤ 0.050	16,400	≤ 0.050	≤ 30	≤ 50	-	-	8.43	≤ 30	≤ 5.0		
	DUP2-20170525	Duplicate	8.45	847	-	-	-	-	3,510	≤ 10	93.3	≤ 30	149	≤ 10	19.8	955	≤ 0.50	7.3	≤ 20	≤ 5.0a	≤ 100	0.385	≤ 0.50	≤ 0.50	≤ 1.0a	≤ 1.0	280	≤ 0.20	14.8	≤ 5.0	≤ 1.0	≤ 0.050	16,400	≤ 0.050	≤ 30	≤ 50	-	-	8.37	≤ 30	≤ 5.0		
	QA/QC RPD%		1	2	-	-	-	-	1	-	1	*	2	*	1	0	*	3	*	*	*	8	*	*	*	*	1	*	1	*	5	*	*	*	0	*	*	*	-	-	1	*	*
	GL16-1-180604	2018 06 04	7.67	762	7.11	-	-	3,660	3,180	2.93	0.0072	≤ 5.0	96.5	≤ 10	126	0.45	18.1	815	≤ 0.20	5.98	13.4	≤ 0.10	71.0	0.172	≤ 0.50	≤ 0.10	0.63	≤ 0.20	256	≤ 0.010	15.5	≤ 0.40	≤ 0.50	≤ 0.050	15,400	≤ 0.020	≤ 0.20	≤ 5.0	≤ 1.0	7.93	≤ 1.0	≤ 4.0	
	GL16-1-190529	2019 05 29	7.63	756	7.03	-	-	4453	3,390	3.06	≤ 0.0500	15.5	89.6	≤ 10	129	4.19	18.5	849	≤ 0.20	6.51	16.2	≤ 0.10	71.1	0.154	0.81	≤ 0.10	0.57	≤ 0.20	259	≤ 0.010	18.0	1.19	≤ 0.50	0.070	15,600	0.037	≤ 0.20	≤ 5.0	≤ 1.0	8.53	≤ 1.0	≤ 4.0	
	GL16-1-200608	2020 06 08	7.98	699	7.08	-	-	3,720	3,020	1.59	-	3.6	95.1	424	112	335	19.9	832	0.062	18.4	13.6	0.011	65.3	0.0570	0.60	0.567	0.93	0.200	249	≤ 0.010	16.7	1.05	≤ 0.10	≤ 0.010	17,200	0.0192	≤ 0.050	≤ 0.20	1.71	6.69	≤ 0.20	1.7	
	GL16-1-210609	2021 06 09	7.98	658	7.01	-	-	-	-	-	-	3.0	87.9	78.9	106	170	17.9	806	0.085	10.7	15.1	0.011	71.2	0.0338	0.10	0.216	0.48	≤ 0.050	285	≤ 0.010	15.9	0.885	≤ 0.10	≤ 0.010	15,300	0.0206	0.060	≤ 0.20	1.28	6.57	≤ 0.20	2.2	
GL17-1-20091112	2009 11 12	-	3,390	-	-	-	-	-	-	-	72	341	4,680	617	3,640	20	1,240	≤ 2	3	10	≤ 0.4	≤ 40	≤ 0.1	≤ 4	4.8	≤ 1.0a	≤ 1	110	-	38	30	≤ 6	≤ 0.1	9,310	≤ 0.1	≤ 1	11	-	133	1	10		
GL17-1-20100811	2010 08 11	-	3,280	-	-	-	-	-	9,080	-	≤ 50a	355	920	582	3,290	22	1,250	≤ 2	3	10	≤ 0.4	≤ 40	≤ 0.1	≤ 4	5.1	≤ 10a	≤ 1	90	-	36	30	≤ 6	≤ 0.1	8,820	≤ 0.1	≤ 1	≤ 100	-	119	≤ 1	≤ 10		
GL30-4-20100811	Duplicate	-	3,170	-	-	-	-	-	8,730	-	62	341	1,160	563	3,640	21	1,210	≤ 2	3	10	≤ 0.4	≤ 40	≤ 0.1	≤ 4	5.2	≤ 10a	≤ 1	90	-	38	30	≤ 6	≤ 0.1	9,450	≤ 0.1	≤ 1	≤ 100	-	129	1	10		
QA/QC RPD%		-	3	-	-	-	-	4	-	-	4	23	3	10	5	3	*	0	0	*	*	2	*	*	*	0	-	5	0	*	*	*	*	7	*	*	*	-	-	8	*	*	
GL17-1-20110628	2011 06 28	-	3,580	-	-	-	-	8,930	-	-	≤ 5	381	2,170	638	3,260	17.3	1,290	≤ 0.2	1.8	16	≤ 0.04	14	0.11	1.1	7.97	4	≤ 0.1	94	-	35	31	3.3	≤ 0.01	8,700	0.01	≤ 0.1	≤ 10	-	143	0.9	9		
GL17-1-20120625	2012 06 25	-	130	-	-	-	-	1,610	-	-	≤ 50a	20	880	18	70	15	582	≤ 2	2	220	≤ 0.4	40	≤ 0.1	4	1	≤ 10a	≤ 1	200	-	≤ 1	≤ 10	≤ 6	≤ 0.10	3,990	≤ 0.1	≤ 1	≤ 100	-	≤ 4	2	≤ 10		
GL17-1-20121204	2012 12 04	-	98	-	-	-	-	1,570	-	-	≤ 50a	15.9	643	14.2	111	13.2	596	≤ 2	3.2	220	≤ 0.40	40	≤ 0.10	11.2	6.11	≤ 10a	≤ 1.0	170	-	≤ 1.0	≤ 10	≤ 6	≤ 0.10	3,920	≤ 0.1	≤ 1.0	≤ 10	-	≤ 4.0	3.33	≤ 10		
GL17-1-20160526	2016 05 26	8.18	118	-	-	-	-	1,480	-	-	≤ 10	18.8	961	17.4	62	14.9	616	≤ 0.50	≤ 1.0	231	≤ 5.0a	≤ 100	≤ 0.050	≤ 0.50	≤ 0.50	≤ 1.0a	≤ 1.0	243	≤ 0.20	≤ 1.0	≤ 5.0	≤ 1.0	≤ 0.050	3,630	≤ 0.050	≤ 30	≤ 50	-	≤ 0.20	≤ 30	≤ 5.0		
GL17-1-20160919	2016 09 19	8.32	123	-	-	-	-	1,490	-	-	≤ 10	19.8	836	17.8	58	14	564	≤ 0.50	1.4	178	≤ 5.0a	≤ 100	≤ 0.050	≤ 0.50	≤ 0.50	≤ 1.0a	≤ 1.0	184	≤ 0.20	≤ 1.0	≤ 5.0	≤ 1.0	≤ 0.050	3,510	≤ 0.010	≤ 30	≤ 50	-	0.31	≤ 30	≤ 5.0		
GL17-1-20170531	2017 05 31	8.13	125	-	-	-	-	1,530	-	-	≤ 10	20	1,680	18.2	69	15	614	≤ 0.50	2.4	216	≤ 5.0a	≤ 100	≤ 0.050	≤ 0.50	≤ 0.50	≤ 1.0a	≤ 1.0	227	≤ 0.20	≤ 1.0	≤ 5.0	≤ 1.0	≤ 0.050	3,840	≤ 0.020	≤ 30	≤ 50	-	≤ 0.20	≤ 30	≤ 5.0		
GL17-1-20170926	2017 09 26	7.95	121	-	-	-	-	1,480	-	-	≤ 10	19.5	1,430	17.5	57	14.9	563	≤ 0.50	2.1	212	≤ 5.0a	≤ 100	≤ 0.050	≤ 0.50	≤ 0.50	≤ 1.0a	≤ 1.0	227	≤ 0.20	≤ 1.0	≤ 5.0	≤ 1.0	≤ 0.050	3,720	≤ 0.020	≤ 30	≤ 50	-	≤ 0.20	≤ 30	≤ 5.0		
GL17-1-180604	2018 06 04	7.83	127	7.3	-	-	2,044	1,480	2.54	≤ 0.0050	≤ 5.0	22.0	1,250	17.4	46.5	14.4	562	≤ 0.20	1.64	198	≤ 0.10	81.8	≤ 0.010	≤ 0.50	0.26	≤ 0.40a	≤ 0.20	231	≤ 0.010	0.42	≤ 0.40	≤ 0.50	≤ 0.050	3,650	≤ 0.020	≤ 0.20	≤ 5.0	≤ 1.0	0.125	≤ 1.0	≤ 4.0		
GL17-1-180919	2018 09 19	7.80	130	7.5	-	-	2,197	1,480	2.83	≤ 0.0050	≤ 5.0	22.6	626	17.9	42.5	13.7	571	≤ 0.20	1.06	185	≤ 0.10	74.7	≤ 0.010	≤ 0.50	0.12	≤ 0.40a	≤ 0.20	206	≤ 0.010	0.35	≤ 0.40	≤ 0.50	≤ 0.050	3,650	≤ 0.020	≤ 0.20	≤ 5.0	≤ 1.0	0.276	≤ 1.0	≤ 4.0		
GL17-1-190527	2019 05 27	8.11	124	7.56	-	-	2,558	1,490	2.02	≤ 0.0050	≤ 5.0	20.8	1,450	17.4	53.8	14.2	567	≤ 0.20	2.22	220	≤ 0.10	87.1	≤ 0.010	0.85	0.23	≤ 0.40a	≤ 0.20	237	≤ 0.010	0.45	0.51	≤ 0.50	≤ 0.050	4,140	≤ 0.020	≤ 0.20	≤ 5.0	≤ 1.0	0.175	≤ 1.0	≤ 4.0		
DUP1-190527	Duplicate	8.13	120	7.56	-	-	2,558	1,470	1.76	≤ 0.0050	≤ 5.0	20.0	1,370	16.9	49.9	13.9	561	≤ 0.20	2.14	217	≤ 0.10	78.0	≤ 0.010	0.79	0.22	≤ 0.40a	≤ 0.20	227	≤ 0.010	0.48	0.51	≤ 0.50	≤ 0.050	3,950	≤ 0.020	≤ 0.20	≤ 5.0	≤ 1.0	0.297	≤ 1.0	≤ 4.0		
QA/QC RPD%		0	3	-	-	-	-	1	-	-	4	6	3	8	2	1	*	4	1	*	11	*	*	*	*	4	*	*	*	*	*	*	*	5	*	*	*	-	-	52	*	*	
GL17-1-190923	2019 09 23	8.11	128	7.67	-	-	2421	1,550	1.92	-	≤ 5.0	21.9	1,450	17.9	54.9	14.3	583	≤ 0.20	2.32	215	≤ 0.10	89.0	≤ 0.010	0.50	0.16	≤ 0.10	≤ 0.20	252	≤ 0.010	0.36	≤ 0.40	≤ 0.50	≤ 0.050	4,040	≤ 0.020	≤ 0.20	≤ 5.0	≤ 1.0	0.144	≤ 1.0	≤ 4.0		
GL17-1-200608	2020 06 08	8.20	121	7.35	-	-	2,138	1,590	2.32	-	1.2	22.6	1,750	15.7	46.9	15.4	629	≤ 0.050	3.27	218	0.015	69.1	≤ 0.001	0.74	0.202	0.49	≤ 0.050	197	≤														

Associated CARO file(s): 8052631, 8052802, 8060237, 8060737, 8061100, 8081412, 8091680, 8092458, 8092618, 9052219, 9052399, 9052558, 9052754, 9052937, 9060273, 9091657, 9092001, 9092208, 9092404, 9120616.

Associated Exova file(s): 622178, 653600, 712940, 714233, 714243, 756693, 756810, 757047, 811364, 811710, 812030, 812741, 812985, 846260, 878316, 879073, 909346, 909448, 909654.

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

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

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

RDL Denotes reported detection limit.

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																													
			pH	Total Hardness mg/L	pH (field)	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum µg/L	Dissolved Calcium mg/L	Dissolved Iron µg/L	Dissolved Magnesium mg/L	Dissolved Manganese µg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Boron µg/L	Cadmium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Lead µg/L	Lithium µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L	
GL23-1 (Cont'd)	GL23-1-20141124	2014 11 24	-	1,210	-	-	-	1,790	-	-	< 10a	87.1	39	240	208	17.5	249	< 0.50	< 1.0	75	< 5.0a	< 100	0.313	< 0.50	0.7	1.6	< 1.0	< 50	< 0.20	16.8	9.5	< 1.0	< 0.050	3,990	< 0.20	< 30	< 50	-	139	< 30	< 5.0	
	GL23-1-20150608	2015 06 08	7.67	1,130	-	-	-	1,700	-	-	< 10	82.6	< 30	224	19	15.3	211	< 0.50	< 1.0	72	< 5.0a	< 100	0.327	< 0.50	< 0.50	2.4	< 1.0	< 50	< 0.20	15.8	9	< 1.0	< 0.050	3,870	< 0.010	< 30	< 50	-	116	< 30	< 5.0	
	GL23-1-20151104	2015 11 04	7.68	1,050	-	-	-	1,570	-	-	< 10	79	< 30	208	642	14.8	194	< 0.50	< 1.0	67	< 5.0a	< 100	0.307	< 0.50	0.56	1.2	< 1.0	< 50	< 0.20	17.3	13.4	< 1.0	< 0.050	3,700	0.011	< 30	< 50	-	99.1	< 30	< 5.0	
	GL23-1-20160526	2016 05 26	7.99	1,080	-	-	-	1,570	-	-	< 10	78.4	< 30	215	77	14.9	203	< 0.50	< 1.0	70	< 5.0a	< 100	0.312	< 0.50	< 0.50	3	< 1.0	< 50	< 0.20	13.8	10.5	< 1.0	< 0.050	3,750	< 0.010	< 30	< 50	-	84.1	< 30	< 5.0	
	GL23-1-20160531	2016 05 31	7.64	-	-	-	-	1,580	-	-	< 50	84.8	< 100	228	25	-	205	< 1	< 5	70	< 1	40	0.4	< 5	< 0.5	< 2a	< 1	39	-	17	9	< 5	< 0.5	4,040	< 0.2	-	< 50	-	90	< 10	< 40	
	GL23-1-20170525	2017 05 25	8.45	1,150	-	-	-	1,610	-	-	< 10	82.6	< 30	229	33	14.9	191	< 0.50	< 1.0	72	< 5.0a	< 100	0.216	< 0.50	< 0.50	3.5	< 1.0	< 50	< 0.20	13.6	9.7	< 1.0	< 0.050	4,100	< 0.010	< 30	< 50	-	74.7	< 30	< 5.0	
	DUP3-20170525	Duplicate	8.41	1,150	-	-	-	1,580	-	-	< 10	85	< 30	228	43	15.8	203	< 0.50	< 1.0	78	< 5.0a	< 100	0.219	< 0.50	< 0.50	3.4	< 1.0	< 50	< 0.20	13.7	9.8	< 1.0	< 0.050	4,270	< 0.010	< 30	< 50	-	73.4	< 30	< 5.0	
	QA/QC RPD%		0	0	-	-	-	2	-	-	*	3	*	0	26	6	6	*	*	8	*	*	1	*	*	3	*	*	*	*	1	1	*	*	4	*	*	*	2	*	*	*
	GL23-1-180529	2018 05 29	7.86	1,260	7.22	-	2,014	1,560	14.3	0.0062	< 5.0	86.2	< 10	254	19.3	15.0	201	< 0.20	< 0.50	63.0	< 0.10	29.9	0.100	< 0.50	0.35	20.0	0.60	38.9	< 0.010	12.4	10.0	< 0.50	< 0.050	4,000	< 0.020	0.82	< 5.0	< 1.0	77.7	< 1.0	< 4.0	
	GL23-1-190523	2019 05 23	8.01	1,170	7.7	-	2332	1,590	14.8	< 0.0050	< 5.0	87.3	< 10	231	5.34	15.7	199	< 0.20	0.56	71.7	< 0.10	34.4	0.076	0.80	0.35	1.95	< 0.20	42.5	< 0.010	13.6	10.6	< 0.50	< 0.050	4,940	< 0.020	< 0.20	< 5.0	< 1.0	80.5	< 1.0	< 4.0	
	GL23-1-190917	2019 09 17	7.78	1,130	-	-	-	1,610	16.4	-	< 5.0	85.2	< 10	222	455	14.5	191	< 0.20	0.52	72.8	< 0.10	31.0	0.409	1.23	0.42	2.72	< 0.20	39.8	-	16.7	13.5	< 0.50	< 0.050	4,780	< 0.020	< 0.20	< 5.0	< 1.0	75.6	1.1	< 4.0	
	GL23-1-200617	2020 06 17	7.97	1,000	6.95	-	2,150	1,530	14.6	-	< 1.0	85.7	< 2.0	192	316	13.7	178	< 0.050	0.581	64.8	< 0.010	30.4	0.0823	0.11	0.746	1.97	< 0.050	36.7	< 0.010	15.0	10.4	0.34	< 0.010	4,430	0.0073	< 0.050	< 0.20	< 0.20	68.9	0.97	1.2	
	GL23-1-200910	2020 09 10	7.98	1,130	-	-	-	1,660	14.8	-	1.2	101	< 2.0	213	870	14.9	189	< 0.050	0.561	69.6	< 0.010	29.5	0.321	0.15	0.690	3.02	< 0.050	41.7	-	17.0	13.3	0.26	< 0.010	4,640	0.0139	< 0.050	< 0.20	< 0.20	74.7	0.79	2.2	
	GL23-1-210513	2021 05 13	7.85	1,080	7.06	-	-	-	-	-	< 1.0	82.7	< 2.0	212	165	14.8	191	< 0.050	0.685	67.4	< 0.010	28.9	0.0358	0.33	0.574	1.68	< 0.050	36.7	< 0.010	13.8	9.61	0.29	< 0.010	3,980	< 0.0040	< 0.050	< 0.20	< 0.20	68.5	0.76	< 1.0	
	DUP 1-210513	Duplicate	7.73	1,090	7.06	-	-	-	-	-	< 1.0	90.1	< 2.0	210	146	14.7	189	< 0.050	0.672	65.9	< 0.010	31.3	0.0323	0.35	0.523	1.97	0.075	40.6	< 0.010	13.6	9.58	0.26	< 0.010	4,170	< 0.0040	< 0.050	< 0.20	< 0.20	74.6	0.60	< 1.0	
	QA/QC RPD%		2	1	0	-	-	-	-	-	*	9	*	1	12	1	1	*	2	2	*	8	10	*	9	16	*	10	*	1	0	*	*	5	*	*	*	9	*	*	*	
GL24-1	GL24-1-20100811	2010 08 11	-	1,200	-	-	-	2,110	-	-	94	93	190	242	1,400	15	254	< 2	2	80	< 0.4	90	0.19	< 4	1.4	< 10a	< 1	20	-	38	20	< 6	< 0.1	4,170	< 0.1	< 1	< 100	-	94	2	< 10	
	GL24-1-20160531	2016 05 31	7.64	-	-	-	-	1,570	-	-	< 50	73.6	< 100	203	7	-	210	< 1	< 5	70	< 1	100	< 0.1a	< 5	< 0.5	< 2a	< 1	25	-	11	3	9	< 0.5	2,470	< 0.2	-	< 50	-	75.9	< 10	< 40	
	GL24-1-180612	2018 06 12	7.63	1,300	-	-	-	2,380	-	0.0083	< 5.0	91.6	< 10	260	342	12.6	391	< 0.20	1.60	61.7	< 0.10	78.6	0.342	< 0.50	1.95	5.47	< 0.20	43.1	< 0.010	24.9	15.1	2.39	< 0.050	3,760	< 0.020	< 0.20	< 5.0	< 1.0	154	2.8	< 4.0	
	GL24-1-20180927	2018 09 27	-	1,760	-	-	-	-	-	-	< 5.0	130	< 10	349	810	15.2	516	0.21	1.67	83.3	< 0.10	89.1	0.256	< 0.50	2.12	6.55	< 0.20	46.2	< 0.010	22.6	19.8	6.22	< 0.050	5,100	0.029	< 0.20	< 5.0	-	192	3.3	< 4.0	
	GL24-1-190917	2019 09 17	7.92	1,100	-	-	-	1,870	9.09	-	36.6	76.8	23	220	104	10.9	308	< 0.20	1.66	46.1	< 0.10	95.9	0.139	1.51	0.90	2.51	< 0.20	42.7	-	24.2	8.71	2.49	< 0.050	3,320	0.020	< 0.20	< 5.0	< 1.0	126	3.0	45.2	
	GL24-1-200910	2020 09 10	8.04	856	-	-	-	1,750	6.56	-	< 1.0	64.6	< 2.0	169	24.7	9.03	226	0.148	1.18	35.2	< 0.010	77.2	0.105	0.35	0.555	1.85	< 0.050	31.6	-	23.6	4.64	2.35	< 0.010	2,620	0.0154	0.053	0.88	< 0.20	101	0.84	1.1	
GL25-1	GL25-1-20091117	2009 11 17	-	1,540	-	-	-	-	-	< 50a	246	< 100	223	3,030	13.3	242	< 2	2	80	< 0.4	< 40	0.2	< 4	6.7	< 10a	< 1	20	-	20	20	< 6	< 0.10	7,760	0.18	< 1	< 10	-	49	< 1	10		
	GL25-1-20100812	2010 08 12	-	1,480	-	-	-	2,630	-	-	221	209	< 100	233	2,330	12.5	234	< 2	< 2	50	< 0.4	< 40	0.1	10	5.3	< 10a	< 1	20	-	7	20	< 6	< 0.1	7,640	< 1	< 1	< 10	-	8	4	< 10	
GL26-1	GL26-1-20091112	2009 11 12	-	654	-	-	-	-	-	-	< 50a	159	460	62.7	1,730	15.2	167	2	42	20	0.6	< 40	0.28	< 4	7	< 10a	< 1	180	-	275	30	< 6	< 0.10	1,670	< 0.1	< 1	< 10	-	52	< 1	< 10	
	GL26-1-20100812	2010 08 12	-	527	-	-	-	1,230	-	-	< 50a	128	850	50.5	1,800	13.9	135	< 2	33	20	0.7	< 40	< 0.1	6	0.8	< 10a	< 1	200	-	56	< 10	< 6	< 0.1	1,670	< 0.1	< 1	< 10	-	12	2	10	
	GL30-5-20100812	Duplicate	-	575	-	-	-	1,250	-	-																																

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																													
			pH	Total Hardness mg/L	pH (field)	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum µg/L	Dissolved Calcium mg/L	Dissolved Iron µg/L	Dissolved Magnesium mg/L	Dissolved Manganese mg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Boron µg/L	Cadmium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Lead µg/L	Lithium µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L	
GL27-1 (Cont'd)	GL27-1-20141118	2014 11 18	-	86.8	-	-	-	1,640	-	-	< 15a	13.4	882	12.9	117	13	619	< 0.50	28	419	< 5.0a	< 100	< 0.25a	< 2.5	< 0.50	< 2.5a	< 1.0	207	< 0.20	34.9	< 5.0	< 5.0	< 0.050	2,900	< 0.50	< 30	< 50	-	1.08	< 30	< 5.0	
	GL27-1-20150610	2015 06 10	8.41	87.1	-	-	-	1,470	-	-	< 10	13.7	878	12.9	110	13.9	706	< 0.50	26.5	406	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	204	< 0.20	42.6	< 5.0	< 1.0	< 0.050	2,930	< 0.050	< 30	< 50	-	1.23	< 30	< 5.0	
	GL27-1-20151104	2015 11 04	8.18	86.6	-	-	-	1,610	-	-	< 10	13.4	39	12.9	106	13.2	626	< 0.50	20.5	365	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	198	< 0.20	36.2	< 5.0	< 1.0	< 0.050	2,770	< 0.020	< 30	< 50	-	1.02	< 30	< 5.0	
	GL27-1-20160526	2016 05 26	8.27	91.8	-	-	-	1,620	-	-	< 10	13.9	662	13.8	102	14.1	708	< 0.50	17.4	432	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	221	< 0.20	43.2	< 5.0	< 1.0	< 0.050	2,900	< 0.050	< 30	< 50	-	1.02	< 30	< 5.0	
	DUP-1-20160526	Duplicate	8.31	85.7	-	-	-	1,690	-	-	< 10	13.1	637	12.9	99	13.4	684	< 0.50	17.9	412	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	212	< 0.20	43.5	< 5.0	< 1.0	< 0.050	2,810	< 0.050	< 30	< 50	-	1.02	< 30	< 5.0	
	QA/QC RPD%		0	7	-	-	-	4	-	-	*	6	4	7	3	5	3	*	3	5	*	*	*	*	*	*	*	*	*	*	1	*	*	*	3	*	*	-	0	*	*	*
	GL27-1-20160919	2016 09 19	8.34	90.8	-	-	-	1,630	-	-	< 10	14.2	695	13.5	104	13.5	633	< 0.50	17.8	433	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	204	< 0.20	37.2	< 5.0	< 1.0	< 0.050	2,970	< 0.050	< 30	< 50	-	0.9	< 30	< 5.0	
	GL27-1-20170525	2017 05 25	8.83	95.2	-	-	-	1,640	-	-	< 10	14.5	713	14.3	101	14.2	710	< 0.50	33.1	451	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	233	< 0.20	79	< 5.0	< 1.0	< 0.050	3,120	< 0.050	< 30	< 50	-	0.94	< 30	< 5.0	
	GL27-1-20170925	2017 09 25	8.14	92	-	-	-	1,650	-	-	< 10	14.1	690	13.8	95	13.7	645	< 0.50	17	438	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	220	< 0.20	44.9	< 5.0	< 1.0	< 0.050	2,960	< 0.020	< 30	< 50	-	0.82	< 30	< 5.0	
	GL27-1-180815	2018 08 15	7.98	89.6	7.63	-	1,870	1,680	2.57	0.0407	< 5.0	14.9	521	12.7	82.1	12.4	584	< 0.20	28.7	470	< 0.10	75.0	0.038	< 0.50	< 0.10	< 0.40a	< 0.20	217	< 0.010	51.2	< 0.40	< 0.50	< 0.050	3,200	< 0.020	< 0.20	< 5.0	< 1.0	1.40	< 1.0	< 4.0	
GL27-1-180919	2018 09 19	7.91	99.9	7.62	-	2,388	1,620	3.45	0.0445	< 5.0	17.1	633	13.8	83.2	13.0	650	< 0.20	23.7	479	< 0.10	64.6	0.010	< 0.50	< 0.10	< 0.40a	< 0.20	228	< 0.010	29.2	< 0.40	< 0.50	< 0.050	3,180	< 0.020	< 0.20	< 5.0	1.2	0.965	< 1.0	< 4.0		
GL27-1-190527	2019 05 27	8.20	90.6	7.67	-	2620	1,430	2.89	0.0794	7.8	14.8	630	13.0	91.5	12.6	602	< 0.20	18.0	472	< 0.10	70.0	< 0.010	0.86	< 0.10	< 0.40a	< 0.20	216	< 0.010	20.9	< 0.40	< 0.50	< 0.050	3,220	< 0.020	< 0.20	< 5.0	1.4	0.983	< 1.0	< 4.0		
GL27-1-190919	2019 09 19	8.22	92.8	7.48	-	2471	1,610	2.84	-	< 5.0	15.3	560	13.2	90.6	13.2	605	< 0.20	16.4	443	< 0.10	69.6	< 0.010	< 0.50	< 0.10	< 0.10	< 0.20	212	< 0.010	7.11	< 0.40	< 0.50	< 0.050	3,070	< 0.020	< 0.20	< 5.0	1.2	0.933	< 1.0	< 4.0		
GL27-1-200608	2020 06 08	8.31	93.2	7.5	-	2,216	1,530	2.12	-	2.8	16.7	636	12.5	90.8	13.5	712	< 0.050	17.7	474	0.025	60.4	0.0051	0.80	0.0068	0.46	< 0.050	194	< 0.010	16.7	0.067	< 0.10	< 0.010	3,320	< 0.0040	< 0.050	0.24	1.35	0.666	0.31	1.0		
GL27-1-201022	2020 10 22	8.10	85.2	7.63	-	2,525	1,600	2.79	-	< 1.0	14.2	551	12.1	82.8	11	566	< 0.050	8.73	424	0.028	64.7	0.0099	< 0.10	0.0068	< 0.10	< 0.050	200	< 0.010	13.4	< 0.040	< 0.10	< 0.010	2,880	< 0.0040	< 0.050	< 0.20	1.25	0.585	0.27	< 1.0		
GL27-1-210602	2021 06 02	8.16	103	7.47	-	-	-	-	-	< 1.0	17.4	112	14.4	116	13.4	672	< 0.050	14.9	458	0.015	68.2	0.0027	0.12	0.0088	< 0.10	< 0.050	241	< 0.010	14.5	< 0.040	< 0.10	< 0.010	3,060	< 0.0040	< 0.050	< 0.20	1.28	0.741	< 0.20	< 1.0		
GL27-1-210924	2021 09 24	8.21	107	7.47	-	-	-	-	-	1.3	18.1	533	15	108	15	721	0.065	12.2	528	0.023	155	< 0.0020	0.27	0.0151	0.19	< 0.050	231	< 0.010	9.23	0.080	< 0.10	< 0.010	2,900	< 0.0040	0.083	0.28	1.38	0.824	< 0.20	1.0		
GL27-2	GL27-1-20111217	2011 12 17	-	83	-	-	-	1,630	-	-	< 50a	13.6	1,140	12	178	11.2	604	2	59	410	< 0.4	70	0.13	8	< 0.2	< 10a	< 1	230	-	68	< 10	< 6	< 0.10	3,180	0.23	< 1	< 10	-	< 4	2	< 10	
	GL27-2-20091116	2009 11 16	-	3,760	-	-	-	-	-	458	300	2,420	731	5,380	33	2,720	< 2	6	60	< 0.4	< 40	0.1	< 4	19.9	< 10a	< 1	50	-	59	30	< 6	< 0.10	15,000	0.28	< 1	15	-	90	3	< 10		
GL27-3	GL27-2-20100812	2010 08 12	-	3,540	-	-	-	14,300	-	-	410	298	690	679	1,940	40	2,900	< 2	7	40	< 0.4	< 60	< 0.1	8	9.2	< 10a	< 1	80	-	53	20	< 6	< 0.1	16,900	0.17	< 1	15	-	91	9	< 10	
	GL27-3-20091112	2009 11 12	-	5,800	-	-	-	-	-	-	< 50a	354	1,440	1,200	996	26	3,300	< 2	9	20	< 0.4	< 40	0.17	< 4	7	< 10a	< 1	70	-	51	20	< 6	< 0.10	11,500	0.22	< 1	< 10	-	94	1	20	
	GL27-3-20100812	2010 08 12	-	4,700	-	-	-	17,800	-	-	131	332	2,440	940	588	31	3,190	< 2	10	20	< 0.4	< 40	< 0.10	8	3.8	< 10a	< 1	80	-	53	10	6	< 0.1	11,500	< 0.1	< 1	< 10	-	70	3	10	
	GL27-3-20110629	2011 06 29	-	5,170	-	-	-	16,700	-	-	32	370	1,690	1,030	374	25.6	3,070	< 0.2	1.7	14	< 0.04	15	0.1	4.8	4.04	6	< 0.1	71	-	64.4	10	41.6	< 0.01	11,000	0.02	< 0.1	< 10	-	66	1.8	5	
	GL27-3-20111217	2011 12 17	-	4,500	-	-	-	17,100	-	-	< 50a	320	1,270	900	270	23.4	2,800	< 2	7	< 10	< 0.4	< 40	0.13	8	2.3	10	< 1	100	-	69	20	< 6	< 0.10	11,600	0.43	< 1	< 10	-	98	6	< 10	
	GL27-3-20120625	2012 06 25	-	5,060	-	-	-	16,400	-	-	< 50a	359	2,190	1,010	350	24	3,050	< 2	7	10	< 0.4	< 40	< 0.1	< 4	3.2	< 10a	< 1	70	-	58	10	< 6	< 0.10	11,400	< 0.1	< 1	< 100	-	75	1	20	
	GL27-3-20121204	2012 12 04	-	4,480	-	-	-	15,900	-	-	< 50a	315	2,540	897	253	21.6	2,960	< 2.0	7.5	20																						

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																													
			pH	Total Hardness mg/L	pH (field)	Conductivity μS/cm	Field Conductivity μS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum μg/L	Dissolved Calcium mg/L	Dissolved Iron μg/L	Dissolved Magnesium mg/L	Dissolved Manganese mg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony μg/L	Arsenic μg/L	Barium μg/L	Beryllium μg/L	Boron μg/L	Cadmium μg/L	Chromium μg/L	Cobalt μg/L	Copper μg/L	Lead μg/L	Lithium μg/L	Mercury μg/L	Molybdenum μg/L	Nickel μg/L	Selenium μg/L	Silver μg/L	Strontium μg/L	Thallium μg/L	Tin μg/L	Titanium μg/L	Tungsten μg/L	Uranium μg/L	Vanadium μg/L	Zinc μg/L	
GL28-1 (Cont'd)	GL28-1-20140603	2014 06 03	-	1,600	-	-	-	3,930	-	-	< 10a	188	1,420	274	209	9.4	537	< 0.50	3.4	< 20	< 5.0a	< 100	< 0.10	< 1.0	0.77	< 1.0a	< 1.0	99	< 0.20	13.4	< 5.0	< 2.0	< 0.050	5,370	< 0.20	< 30	< 50	-	116	< 30	< 5.0	
	GL28-1-20141117	2014 11 17	-	1,690	-	-	-	3,970	-	-	< 10a	197	1,540	292	212	9.9	559	< 0.50	3	< 20	< 5.0a	< 100	< 0.10	< 1.0	0.63	< 1.0a	< 1.0	91	< 0.20	13.2	< 5.0	< 2.0	< 0.050	5,700	< 0.20	< 30	< 50	-	118	< 30	< 5.0	
	GL28-1-20150611	2015 06 11	7.93	1,630	-	-	-	3,920	-	-	< 10	192	1,520	280	208	9.4	518	< 0.50	3.2	< 20	< 5.0a	< 100	< 0.050	< 0.50	0.6	< 1.0a	< 1.0	81	< 0.20	14	< 5.0	< 1.0	< 0.050	5,370	< 0.020	< 30	< 50	-	131	< 30	< 5.0	
	GL28-1-20151105	2015 11 05	7.65	1,600	-	-	-	3,930	-	-	< 10	190	1,600	274	214	9.6	553	< 0.50	3.1	< 20	< 5.0a	< 100	< 0.050	< 0.50	0.5	< 1.0a	< 1.0	88	< 0.20	13.9	< 5.0	< 1.0	< 0.050	5,850	< 0.020	< 30	< 50	-	122	< 30	< 5.0	
	GL28-1-20160524	2016 05 24	7.97	1,710	-	-	-	3,950	-	-	< 10	197	1,750	295	220	10.1	561	< 0.50	3.9	< 20	< 5.0a	< 100	< 0.050	< 0.50	0.58	< 1.0a	< 1.0	93	< 0.20	14.2	< 5.0	< 1.0	< 0.050	5,710	< 0.020	< 30	< 50	-	121	< 30	< 5.0	
	GL28-1-20160920	2016 09 20	7.69	1,740	-	-	-	4,080	-	-	< 10	194	1,800	305	260	10.4	557	< 0.50	3.5	< 20	< 5.0a	< 100	< 0.050	< 0.50	0.6	< 1.0a	< 1.0	87	< 0.20	12.5	< 5.0	< 1.0	< 0.050	5,790	< 0.020	< 30	< 50	-	123	< 30	< 5.0	
	GL28-1-20170711	2017 07 11	8.21	1,620	-	-	-	3,740	-	-	< 10	193	1,680	276	230	10	560	< 0.50	2.6	< 20	< 5.0a	< 100	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	90	< 0.20	12.2	< 5.0	< 1.0	< 0.050	5,500	< 0.020	< 30	< 50	-	109	< 30	< 5.0	
	GL28-1-20170926	2017 09 26	7.67	1,620	-	-	-	3,460	-	-	< 10	189	1,720	279	237	10.4	519	< 0.50	3.3	< 20	< 5.0a	< 100	< 0.050	< 0.50	0.55	< 1.0a	< 1.0	88	< 0.20	12.4	< 5.0	< 1.0	< 0.050	5,480	< 0.020	< 30	< 50	-	107	< 30	< 5.0	
	GL28-1-180528	2018 05 28	7.72	1,710	6.99	-	3,741	3,730	4.85	< 0.0050	< 5.0	201	333	292	148	11.7	536	< 0.20	1.01	14.7	< 0.10	18.3	0.193	< 0.50	0.48	0.98	< 0.20	81.1	< 0.010	12.4	1.96	0.72	< 0.050	5,950	< 0.020	< 0.20	< 5.0	< 1.0	123	< 1.0	< 4.0	
	GL28-1-180925	2018 09 25	7.72	1,750	7.21	-	3,761	3,770	4.88	< 0.0050	< 5.0	207	1,220	300	301	11.3	553	< 0.20	1.49	9.7	< 0.10	20.2	0.041	< 0.50	0.70	< 0.40a	< 0.20	85.9	< 0.010	12.9	1.85	< 0.50	< 0.050	6,000	< 0.020	< 0.20	< 5.0	< 1.0	115	< 1.0	< 4.0	
	DUP1-180925	Duplicate	7.73	1,730	7.21	-	3,761	3,930	4.81	< 0.0050	< 5.0	207	1,280	295	313	11.9	544	< 0.20	1.75	10.0	< 0.10	10.1	0.039	< 0.50	0.71	1.15	< 0.20	69.3	< 0.010	13.1	1.93	< 0.50	< 0.050	5,910	< 0.020	< 0.20	< 5.0	< 1.0	114	< 1.0	< 4.0	
	QA/QC RPD%	0	1	*	-	*	4	1	*	*	0	5	2	4	5	2	16	3	67	*	1	3	67	*	1	*	21	*	2	*	2	*	*	*	*	*	*	1	*	*	*	
	GL28-1-190528	2019 05 28	7.81	1,690	7.12	-	3,741	3,650	4.74	< 0.0500	< 5.0	195	1,720	293	297	10.2	489	< 0.20	2.30	10.8	< 0.10	14.5	0.034	1.04	0.64	< 0.40a	< 0.20	91.1	< 0.010	13.0	1.66	< 0.50	< 0.050	6,420	< 0.020	< 0.20	< 5.0	< 1.0	119	< 1.0	< 4.0	
	GL28-1-190919	2019 09 19	7.78	1,650	7.39	-	3802	3,470	4.47	-	< 5.0	193	1,710	284	300	9.94	448	< 0.20	2.36	10.0	< 0.10	18.8	0.021	< 0.50	0.60	< 0.10	< 0.20	80.7	< 0.010	12.4	1.71	< 0.50	< 0.050	6,190	< 0.020	< 0.20	< 5.0	< 1.0	120	< 1.0	< 4.0	
	GL28-1-200610	2020 06 10	7.71	1,770	7.15	-	3,321	3,300	4.43	-	< 1.0	214	1,720	300	287	10.7	461	< 0.050	3.37	10.1	0.014	18.6	0.0107	0.14	0.536	0.21	< 0.050	83.0	< 0.010	12.6	0.871	< 0.10	< 0.010	6,210	0.0044	< 0.050	< 0.20	< 0.20	112	0.30	1.3	
	DUPB-200610	Duplicate	7.75	1,630	7.15	-	3,321	3,680	3.83	-	< 1.0	208	1,760	269	276	10.3	415	< 0.050	3.67	10.9	0.019	11.1	0.0120	0.17	0.541	0.22	< 0.050	62.6	< 0.010	13.1	0.906	< 0.10	< 0.010	6,270	0.0050	< 0.050	< 0.20	< 0.20	112	0.24	1.4	
	QA/QC RPD%	1	8	*	-	-	*	11	15	-	*	3	2	11	4	4	11	*	9	8	*	51	11	*	1	*	28	*	4	*	1	*	*	*	*	*	1	*	0	*	*	
	GL28-1-201104	2020 11 04	7.82	1,850	7.14	-	4,082	3,840	6.24	-	< 1.0	237	1,770	306	320	11.5	454	< 0.050	2.90	9.69	0.022	16.4	0.0046	< 0.10	0.589	0.40	< 0.050	82.5	< 0.010	13.3	1.79	< 0.10	< 0.010	7,000	0.0045	< 0.050	< 0.20	< 0.20	118	< 0.20	1.4	
	DUP3-201104	Duplicate	7.80	1,850	-	-	-	3,450	6.09	-	< 1.0	236	1,760	307	316	11.5	451	< 0.050	2.86	9.59	0.072	16.4	0.0059	< 0.10	0.577	2.83	< 0.050	84.1	< 0.010	13.1	1.76	< 0.10	< 0.010	7,000	0.0043	< 0.050	< 0.20	< 0.20	119	< 0.20	< 1.0	
	QA/QC RPD%	0	0	-	-	-	-	11	2	-	*	0	1	0	1	0	1	*	*	*	0	*	*	*	2	*	2	*	2	*	2	*	2	*	10	*	*	*	2	*	2	*
	GL28-1-210609	2021 06 09	7.83	1,720	6.99	-	-	-	-	-	2.2	220	1,670	283	314	10.6	407	< 0.050	2.44	10.0	0.013	17.0	0.0057	0.15	0.565	0.34	< 0.050	82.9	< 0.010	12.1	1.76	< 0.10	< 0.010	5,950	0.0041	< 0.050	< 0.20	< 0.20	110	< 0.20	1.2	
	GL28-1-211007	2021 10 07	7.80	1,860	7.04	-	-	-	-	-	6.7	195	1,830	333	341	11.7	442	< 0.050	2.68	10.6	0.014	12.3	0.0093	0.19	0.598	0.36	< 0.050	61.1	< 0.010	14.5	1.98	< 0.10	< 0.010	5,590	< 0.0040	< 0.050	< 0.20	< 0.20	123	< 0.20	< 1.0	
	DUP 3-211007	Duplicate	7.78	1,840	7.04	-	-	-	-	-	13.7	192	1,880	330	334	12	454	< 0.050	2.96	10.9	< 0.010	12.1	0.0099	0.23	0.580	0.58	< 0.050	62.6	< 0.010	14.4	1.94	< 0.10	< 0.010	6,200	0.0043	< 0.050	< 0.20	< 0.20	121	< 0.20	< 1.0	
	QA/QC RPD%	0	1	0	-	-	-	-	-	-	69	2	3	1	2	3	3	*	10	3	*	2	*	*	*	3	*	7	*	3	*	10	*	*	*	*	*	2	*	2	*	
GL28-2	GL28-2-20091116	2009 11 16	-	1,530	-	-	-	-	-	-	< 50a	245	< 100	224	62	12	561	< 2	< 2	20	< 0.4	< 40	0.1	< 4	0.5	< 10a	< 1	40	-	4	< 10	< 6	< 0.10	4,940	< 0.1	< 1	< 10	-	130	1	< 10	
	GL28-2-20160524	2016 05 24	7.72	1,840	-	-	-	4,530	-																																	

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																																		
			pH	Total Hardness mg/L	pH (field)	Conductivity μS/cm	Field Conductivity μS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum μg/L	Dissolved Calcium μg/L	Dissolved Iron μg/L	Dissolved Magnesium mg/L	Dissolved Manganese mg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony μg/L	Arsenic μg/L	Barium μg/L	Beryllium μg/L	Boron μg/L	Cadmium μg/L	Chromium μg/L	Cobalt μg/L	Copper μg/L	Lead μg/L	Lithium μg/L	Mercury μg/L	Molybdenum μg/L	Nickel μg/L	Selenium μg/L	Silver μg/L	Strontium μg/L	Thallium μg/L	Tin μg/L	Titanium μg/L	Tungsten μg/L	Uranium μg/L	Vanadium μg/L	Zinc μg/L						
GL28-3	GL28-3-200610	2020 06 10	7.67	2,890	6.92	-	-	-	-	7,680	9.25	-	-	-	-	-	< 1.0	395	< 2.0	462	130	12.7	1,190	0.110	0.893	19.9	0.012	6.0	0.180	0.35	0.356	1.45	< 0.050	40.5	< 0.010	13.1	8.14	0.23	< 0.010	9,460	0.0300	< 0.050	0.22	< 0.20	273	1.68	1.8
	GL28-3-201105	2020 11 05	7.75	2,870	6.96	-	-	-	-	7,810	9.33	-	-	-	-	-	< 1.0	408	4.2	448	281	12.3	1,170	0.142	0.815	19.2	< 0.010	5.0	0.227	0.28	0.484	1.69	< 0.050	46.5	< 0.010	16.5	11.6	0.17	< 0.010	8,710	0.0416	0.087	0.34	< 0.20	269	2.02	3.0
	GL28-3-210609	2021 06 09	7.80	2,820	7.00	-	-	-	-	-	-	-	-	-	-	-	1.7	339	< 2.0	479	27.0	12.6	1,170	0.157	0.684	18.5	< 0.010	6.6	0.0836	0.34	0.118	1.62	< 0.050	51.5	< 0.010	12.9	4.96	0.13	< 0.010	8,070	0.0194	< 0.050	< 0.20	< 0.20	255	1.22	4.3
	GL28-3-211007	2021 10 07	7.69	3,090	6.87	-	-	-	-	-	-	-	-	-	-	-	1.2	351	2.2	537	186	15.2	1,230	0.139	0.820	21.5	< 0.010	4.5	0.208	0.34	0.191	1.42	< 0.050	32.7	< 0.010	17.3	9.09	0.29	< 0.010	8,300	0.0408	< 0.050	< 0.20	< 0.20	306	1.46	2.0
GL29-1	GL29-1-20130708	2013 07 08	-	444	-	-	-	-	-	1,160	-	-	-	-	-	-	< 10a	82.5	217	57.8	658	10.5	272	< 0.50	3	60	< 5.0a	< 100	< 0.050	< 0.50	1.25	< 1.0a	< 1.0	114	< 0.20	8.8	< 5.0	< 1.0	< 0.050	2,530	< 0.20	< 30	< 50	-	12.1	< 30	< 5.0
	GL29-1-20131113	2013 11 13	-	493	-	-	-	-	-	1,280	-	-	-	-	-	-	< 10a	83.7	597	69	1,130	9.8	315	< 0.50	5.1	98	< 5.0a	< 100	< 0.050	< 0.50	2.91	< 1.0a	< 1.0	82	< 0.20	15.8	8.3	< 1.0	< 0.050	2,580	< 0.20	< 30	< 50	-	23.7	< 30	< 5.0
	DUP3-20131113	Duplicate	-	495	-	-	-	-	-	1,240	-	-	-	-	-	-	< 10a	84	593	69.3	1,130	9.7	311	< 0.50	5.1	96	< 5.0a	< 100	< 0.10	< 1.0	2.97	< 1.0a	< 1.0	79	< 0.20	15.8	8.5	< 2.0	< 0.050	2,570	< 0.20	< 30	< 50	-	22.8	< 30	< 5.0
	QA/QC RPD%		-	0	-	-	-	-	-	3	-	-	-	-	-	-	*	0	1	0	0	1	1	*	0	2	*	*	*	*	2	*	*	*	4	*	*	*	*	-	2	*	*				
	GL29-1-20140603	2014 06 03	-	516	-	-	-	-	-	1,430	-	-	-	-	-	-	< 10a	84.6	438	73.9	946	8.6	320	< 0.50	3.8	108	< 5.0a	< 100	< 0.050	< 0.50	7.65	< 1.0a	< 1.0	63	< 0.20	16.5	8.2	< 1.0	< 0.050	2,520	< 0.20	< 30	< 50	-	27.9	< 30	< 5.0
	GL29-1-20141118	2014 11 18	-	699	-	-	-	-	-	1,950	-	-	-	-	-	-	< 10a	106	1,980	105	1,530	9.8	411	< 0.50	6.5	134	< 5.0a	< 100	< 0.10	< 1.0	14.4	< 1.0a	< 1.0	61	< 0.20	21	8.8	< 2.0	< 0.050	3,460	< 0.20	< 30	< 50	-	30.4	< 30	< 5.0
	GL29-1-20150609	2015 06 09	8.12	629	-	-	-	-	-	1,900	-	-	-	-	-	-	< 10	99.5	823	92.4	1,250	9.3	391	< 0.50	4.5	111	< 5.0a	< 100	< 0.050	< 0.50	8.07	< 1.0a	< 1.0	51	< 0.20	20.2	8.8	< 1.0	< 0.050	3,370	< 0.020	< 30	< 50	-	31.6	< 30	< 5.0
	GL29-1-20151105	2015 11 05	7.85	671	-	-	-	-	-	1,780	-	-	-	-	-	-	< 10	116	176	92.5	1,070	9.6	347	< 0.50	1.9	93	< 5.0a	< 100	0.057	< 0.50	12.6	5.3	< 1.0	< 50	< 0.20	23.3	18.7	< 1.0	< 0.050	3,100	< 0.020	< 30	< 50	-	36	< 30	< 5.0
	GL29-1-20160524	2016 05 24	7.94	682	-	-	-	-	-	1,650	-	-	-	-	-	-	< 10	128	94	87.9	861	10.2	306	< 0.50	2.4	83	< 5.0a	240	0.097	0.58	5.88	13.5	< 1.0	< 50	< 0.20	29.9	30.1	< 1.0	< 0.050	2,880	< 0.020	< 30	< 50	-	46.9	< 30	< 5.0
	GL29-1-20160921	2016 09 21	8.08	639	-	-	-	-	-	1,590	-	-	-	-	-	-	< 10	118	47	83.6	885	9.7	312	0.5	2.3	86	< 5.0a	190	0.2	< 0.50	14.5	13.5	< 1.0	< 50	< 0.20	28.9	30.1	< 1.0	< 0.050	3,050	< 0.020	< 30	< 50	-	49.9	< 30	< 5.0
	GL29-1-20170529	2017 05 29	8.1	586	-	-	-	-	-	1,300	-	-	-	-	-	-	< 10	115	< 30	72.8	< 10	10.2	272	0.54	2.1	68	< 5.0a	210	0.07	< 0.50	1.64	13.4	< 1.0	51	< 0.20	23.8	19.8	< 1.0	< 0.050	2,770	< 0.010	< 30	< 50	-	41.1	< 30	< 5.0
	GL29-1-20170926	2017 09 26	7.88	542	-	-	-	-	-	1,290	-	-	-	-	-	-	< 10	101	< 30	70.2	312	9.8	262	0.52	2.1	69	< 5.0a	170	0.297	< 0.50	12.6	8.8	< 1.0	52	< 0.20	21.4	21.2	< 1.0	< 0.050	2,730	< 0.010	< 30	< 50	-	38.2	< 30	< 5.0
	DUP1-20170926	Duplicate	7.88	539	-	-	-	-	-	1,330	-	-	-	-	-	-	< 10	99.6	< 30	70.6	307	9.8	258	0.53	2.2	68	< 5.0a	170	0.305	< 0.50	13	9.1	< 1.0	53	< 0.20	21.6	22.3	< 1.0	< 0.050	2,690	< 0.010	< 30	< 50	-	38.6	< 30	< 5.0
	QA/QC RPD%		0	1	-	-	-	-	-	3	-	-	-	-	-	-	*	*	1	2	0	2	*	5	1	*	0	3	*	*	3	3	*	2	*	*	*	4	*	*	*	*					
	GL29-1-180604	2018 06 04	7.71	659	7.24	-	-	-	-	1,240	1,220	118	0.0343	6.1	191	73	43.7	39.8	16.0	70.9	1.30	3.64	51.9	< 0.10	512	0.267	2.08	2.15	84.0	< 0.20	16.4	< 0.010	40.1	30.8	0.69	< 0.050	1,570	0.039	< 0.20	< 5.0	1.7	21.5	5.5	6.1			
	GL29-1-180919	2018 09 19	7.70	683	7.38	-	-	-	1,389	1,190	93.7	< 0.0050	< 5.0	192	78	49.2	637	15.8	83.2	1.70	3.88	63.4	< 0.10	518	0.371	1.97	53.0	84.5	< 0.20	18.6	< 0.010	45.0	39.2	0.79	< 0.050	1,720	0.054	< 0.20	< 5.0	5.1	27.3	5.2	7.7				
	GL29-1-190603	2019 06 03	7.76	467	7.06	-	-	-	1,715	1,160	12.8	< 0.0500	38.8	87.4	65	60.3	557	11.1	284	0.80	1.67	52.4	0.20	92.0	0.053	< 0.50	20.1	1.92	< 0.20	118	< 0.010	9.71	6.47	0.60	< 0.050	3,190	< 0.020	< 0.20	< 5.0	1.0	19.0	< 1.0	< 4.0				
	GL29-1-190924	2019 09 24	7.89	448	7	-	-	-	1,731	1,160	11.1	-	8.3	79.6	584	60.6	704	9.74	267	0.33	2.08	68.5	< 0.10	75.2	< 0.010	0.71	3.33	< 0.10	< 0.20	89.8	< 0.010	1.67	2.82	0.66	< 0.050	2,860	< 0.020	< 0.20	< 5.0	5.2	31.4	1.2	< 4.0				
	GL29-1-200612	2020 06 12	7.04	421	7.01	-	-	-	1,380	1,110	6.25	-	1.9	74.4	1,030	57	674	9.32	263	0.478	4.78	68.4	0.089	59.8	0.0043	0.19	33.0	< 0.10	< 0.050	99.1	< 0.010	8.96	2.52	0.11	< 0.010	2,880	< 0.0040	0.051	0.29	4.51	25.2	0.30	< 1.0				
	GL29-1-201120	2020 11 20	7.84	442	7.07	-	-	-	1,723	1,050	3.16	-	1.1	84.5	89																																

Table 2: Historical Summary of Analytical Results For Groundwater -Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Dissolved Metals																													
			pH	Total Hardness mg/L	pH (field)	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Dissolved Organic Carbon mg/L	Phosphate mg/L	Dissolved Aluminum µg/L	Dissolved Calcium µg/L	Dissolved Iron µg/L	Dissolved Magnesium mg/L	Dissolved Manganese mg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Boron µg/L	Cadmium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Lead µg/L	Lithium µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L	
GL35-3 (Cont'd)	GL35-3-20170926	2017 09 26	7.45	2,010	-	-	-	7,480	-	-	< 10	196	25,000	369	374	32.9	2,110	< 0.50	< 1.0	< 30	< 15a	< 300	< 0.050	< 0.50	< 0.50	< 1.0a	< 1.0	368	< 0.20	< 1.0	< 5.0	< 1.0	< 0.050	8,380	< 0.050	< 90	< 50	-	3.75	< 90	< 15	
	GL35-3-180815	2018 08 15	7.29	2,070	6.98	-	6,480	8,230	7.93	< 0.0050	< 5.0	211	24,800	374	443	34.1	1,980	< 0.20	0.67	17.2	< 0.10	87.0	< 0.010	0.52	< 0.10	< 0.40a	< 0.20	413	< 0.010	0.21	< 0.40	< 0.50	< 0.050	8,860	< 0.020	< 0.20	< 5.0	< 1.0	4.17	1.2	< 4.0	
	GL35-3-190530	2019 05 30	7.58	2,000	6.85	-	9132	7,760	4.72	< 0.0500	5.1	194	23,200	368	348	32.0	1,980	0.21	0.61	16.3	< 0.10	76.9	< 0.010	1.28	< 0.10	< 0.40a	< 0.20	421	< 0.010	0.27	0.46	< 0.50	< 0.050	9,410	< 0.020	< 0.20	< 5.0	< 1.0	7.01	1.3	< 4.0	
	GL35-3-200608	2020 06 08	7.73	2,180	6.73	-	7,916	7,520	3.66	-	3.0	228	16,700	392	377	37.1	2,040	< 0.050	0.842	15.9	0.066	55.4	0.0077	1.73	0.0296	0.90	< 0.050	350	< 0.010	2.34	0.361	0.10	< 0.010	9,340	< 0.0040	< 0.050	1.16	< 0.20	21.9	1.25	< 1.0	
	DUPA-200608	Duplicate	7.73	2,080	6.73	-	7,916	7,520	4.14	-	2.9	213	15,900	376	363	36.2	2,090	< 0.050	0.820	15.8	0.059	50.2	0.0067	1.62	0.0297	0.97	< 0.050	316	< 0.010	2.29	0.350	0.11	< 0.010	9,410	< 0.0040	< 0.050	1.19	< 0.20	21.0	1.23	< 1.0	
	QA/QC RPD%		0	5	-	-	-	0	12	-	-	7	5	4	4	2	2	-	3	1	11	10	-	7	0	7	-	10	-	2	3	-	-	-	-	3	4	2	-	-		
	GL35-3-210610	2021 06 10	7.49	1,860	6.67	-	-	-	-	-	2.5	213	463	322	347	26.9	1,670	< 0.050	0.162	16.3	0.038	64.2	< 0.0020	< 0.10	0.0148	0.19	< 0.050	408	< 0.010	2.14	0.427	< 0.10	< 0.010	7,440	< 0.0040	< 0.050	< 0.20	< 0.20	20.7	< 0.20	< 1.0	
	DUP3-210610	Duplicate	7.47	1,870	6.67	-	-	-	-	-	1.7	212	35.9	325	351	27.2	1,720	< 0.050	0.151	16.3	0.037	63.2	0.0022	< 0.10	0.0173	0.16	< 0.050	413	< 0.010	2.16	0.403	< 0.10	< 0.010	7,470	< 0.0040	< 0.050	< 0.20	< 0.20	21.4	< 0.20	< 1.0	
QA/QC RPD%		0	1	0	-	-	-	-	-	-	0	171	1	1	1	3	-	-	0	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
GL37	GL37-20130708	2013 07 08	-	5,860	-	-	-	35,900	-	-	< 150a	285	6,850	1,250	1,160	200	6,650	< 5.0	15.2	< 100	< 50a	< 1,000a	< 2.5a	< 25a	< 5.0	176	< 2.5	< 100	< 0.20	104	57	< 50a	< 0.50	7,660	< 5.0a	< 300	< 100	-	251	< 300a	< 50	
	GL37-20131114	2013 11 14	-	5,970	-	-	-	28,600	-	-	< 150a	298	7,060	1,270	1,150	210	7,010	< 5.0	16.1	< 100	< 50a	< 1,000a	< 2.5a	< 25a	< 5.0	< 25a	< 2.5	< 100	< 0.20	103	< 25	< 50a	< 0.50	8,160	< 5.0a	< 300	< 100	-	236	< 300a	< 50	
GL39-1	GL39-1-191205	2019 12 05	7.86	1,790	-	-	-	3,610	8.17	-	< 5.0	180	< 10	326	161	12.4	406	< 0.20	< 0.50	14.8	< 0.10	20.4	0.070	< 0.50	1.40	0.89	< 0.20	61.6	< 0.010	21.5	1.89	4.89	< 0.050	5,690	0.034	< 0.20	< 5.0	< 1.0	191	< 1.0	< 4.0	
	GL39-1-200609	2020 06 09	7.81	2,120	7.02	-	3,724	3,710	6.40	-	1.1	229	< 2.0	376	31.8	14.2	476	< 0.050	0.333	13.5	< 0.010	15.9	0.0609	0.50	0.286	1.19	< 0.050	67.4	< 0.010	22.4	1.07	10.6	< 0.010	45.5	0.0157	< 0.050	< 0.20	< 0.20	219	0.42	1.4	
GL39-2	GL39-1-201019	2020 10 19	7.85	1,970	2.03	-	4,547	4,140	8.10	-	1.7	253	3.9	324	10.2	13.5	380	< 0.050	0.472	12.4	< 0.010	8.4	0.0459	0.35	0.207	1.16	< 0.050	59.5	< 0.010	22.4	1.02	5.58	< 0.010	6,840	0.0144	< 0.050	0.24	< 0.20	219	0.23	1.4	
	GL39-1-210526	2021 05 26	7.71	3,300	6.92	-	-	-	-	-	2.2	325	< 2.0	605	18.0	16.5	566	< 0.050	0.372	14.1	< 0.010	20.9	0.0578	0.21	0.220	1.58	< 0.050	96.0	< 0.010	22.1	1.00	14.6	< 0.010	8,270	0.0184	< 0.050	< 0.20	< 0.20	310	< 0.20	1.2	
	GL39-1-210914	2021 09 14	-	2,630	6.96	-	-	-	-	-	2.5	284	9.1	466	16.1	16	578	0.059	0.619	14.3	< 0.010	33.6	0.0629	0.34	0.256	2.32	< 0.050	74.5	< 0.010	26.2	1.33	2.69	< 0.010	6,770	0.0189	< 0.050	< 0.20	< 0.20	276	< 0.20	1.9	
	GL39-2-191205	2019 12 05	7.93	1,940	-	-	-	5,110	7.99	-	5.7	183	< 10	360	13.3	11.3	741	< 0.20	0.51	16.2	< 0.10	15.2	0.050	12.9	0.16	1.75	< 0.20	28.6	< 0.010	21.5	2.18	12.2	< 0.050	4,940	< 0.020	< 0.20	< 5.0	< 1.0	131	< 1.0	< 4.0	
	GL39-2-200609	2020 06 09	7.85	1,910	7.29	-	4,140	4,110	6.23	-	4.5	188	8.8	349	6.72	9.71	1.27	0.059	0.419	12.3	< 0.010	9.7	0.0480	7.30	0.137	1.74	< 0.050	23.6	< 0.010	23.2	1.33	4.73	< 0.010	27.6	0.0111	< 0.050	0.31	< 0.20	120	0.79	< 1.0	
	GL39-2-201016	2020 10 16	7.88	1,240	7.35	-	3,324	2,990	6.14	-	1.6	117	< 2.0	230	4.88	7.93	531	0.082	0.422	12.9	< 0.010	10.9	0.0236	3.31	0.109	1.63	< 0.050	22.2	< 0.010	26.8	1.02	5.17	< 0.010	2,870	0.0089	0.132	< 0.20	< 0.20	89.8	0.61	< 1.0	
	DUP1-201016	Duplicate	7.90	1,260	7.69	-	1,582	3,090	5.89	-	1.6	121	< 2.0	233	4.86	7.9	545	0.085	0.421	12.8	< 0.010	10.3	0.0213	3.29	0.105	1.48	< 0.050	22.0	< 0.010	26.9	1.02	5.22	< 0.010	2,840	0.0084	0.217	< 0.20	< 0.20	91.1	0.60	< 1.0	
	QA/QC RPD%		0	2	-	-	-	3	4	-	-	3	-	1	0	0	3	-	-	1	-	6	10	-	1	4	14	-	1	-	0	0	1	-	-	-	-	-	-	1	-	-
	GL39-2-210526	2021 05 26	7.98	1,090	7.31	-	-	-	-	-	1.4	106	< 2.0	201	5.71	7.24	430	< 0.050	0.404	10.9	< 0.010	11.8	0.0176	1.15	0.0787	1.43	< 0.050	20.4	< 0.010	26.6	0.932	0.92	< 0.010	2,400	0.0067	0.055	0.22	< 0.20	80.6	0.38	< 1.0	
	DUP 2-210526	Duplicate	7.98	1,100	7.31	-	-	-	-	-	1.1	106	< 2.0	203	5.38	7.32	434	0.059	0.354	10.6	< 0.010	11.2	0.0176	1.13	0.0828	1.67	< 0.050	20.7	< 0.010	26.5	0.906	0.95	< 0.010	2,440	0.0064	0.062	< 0.20	< 0.20	82.6	0.44	< 1.0	
QA/QC RPD%		0	1	0	-	-	-	-	-	-	0	-	1	6	1	1	-	13	3	-	5	0	2	5	15	-	1	-	0	3	3	-	-	-	-	-	-	-	2	-	-	
GL40-3	GL39-2-210914	2021 09 14	-	1,800	7.27	-	-	-	-	97.7	182	167	327	15.3	9.42	630	0.070	0.692	20.5	< 0.010	22.8	0.0369	2.81	0.283	2.02	0.075	21.5	< 0.010	29.3	1.83	11.9	< 0.010	3,770	0.0116	< 0.050	8.35	< 0.20	134	< 0.20	1.0		
	GL40-3-201117	2020 11 17	8.09	311	7.31	-	4,621	3,000	66.4	-	2.1	75.4	66.6	29.7	466	10.6	1,230	1.45</																								

Table 3: Historical Summary of Analytical Results For Surface Water - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters																	Dissolved Inorganics																
			pH	Hardness	pH (field)	Temperature	Conductivity	Field Conductivity	Total Dissolved Solids	Total Suspended Solids	Dissolved Organic Carbon	Total Nitrogen-N	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Nitrate+Nitrite Nitrogen	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bicarbonate	Kjeldahl Nitrogen-N	Bromide	Chemical Oxygen Demand	Phosphate	Ortho-Phosphate	Total Organic Carbon	Total Phosphorous as P				
BREDIN POND	Bredin Pond-20010611	2001 06 11	-	-	-	-	-	-	1,180	-	-	-	-	-	-	-	-	320	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-			
	Bredin Pond-20010815	2001 08 15	-	-	-	-	-	-	1,360	-	-	-	-	-	-	-	-	375	-	-	-	-	-	-	-	-	-	-	-	-	18	-				
	Bredin Pond-20010920	2001 09 20	-	-	-	-	-	-	1,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.3	-				
	Bredin Pond-20080506	2008 05 06	8.46	-	-	-	-	1,470	-	1,000	-	-	140	< 20	-	-	79.8	-	198	546	-	-	-	-	-	0.75	-	14	-	< 0.01	11.2	-	-			
	Bredin Pond-20080507	2008 05 07	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Bredin Pond-20080520	2008 05 20	8.39	728	-	-	-	1,470	-	994	< 1	-	120	189	-	-	94	-	216	542	-	-	-	-	-	1.16	-	20	-	< 0.01	11.8	-	-			
	Bredin Pond-20090521	2009 05 21	-	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Bredin Pond-20091119	2009 11 19	-	716	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Bredin Pond-20130429	2013 04 29	8.82	757	-	-	-	1,860	-	1,170	< 3.0	-	28.9	< 100	-	-	128	1,530	285	-	-	-	-	-	-	-	< 1.0	42	-	-	0.0099	11.5	-	-		
	Bredin Pond-20130528	2013 05 28	8.56	745	-	-	-	1,910	-	1,050	< 3.0	-	90.8	< 100	-	-	135	1,150	286	-	-	-	-	-	-	-	< 1.0	35	-	-	0.105	9.4	-	-		
	Bredin Pond-20130718	2013 07 18	8.76	789	-	-	-	1,990	-	1,230	10.3	-	< 5.0	< 100	-	-	133	1,540	309	736	611	124	< 1.0	-	-	1.82	< 1.0	43	-	0.176	16.2	-	-			
	Bredin Pond-20131016	2013 10 16	8.9	766	-	-	-	1,930	-	1,310	6.3	-	22.4	< 100	-	-	140	1,010	308	739	581	158	< 1.0	-	-	1.46	< 1.0	43	-	0.0011	11.2	-	-			
	Bredin Pond-20140331	2014 03 31	8.66	759	-	-	-	1,950	-	1,240	< 3.0	-	96.8	460	-	-	129	1,170	307	724	617	107	< 1.0	-	-	1.09	< 1.0	34	-	0.056	9.83	-	-			
	Bredin Pond-20140528	2014 05 28	8.86	754	-	-	-	1,960	-	1,280	3.1	-	12.3	< 100	-	-	134	1,480	315	628	494	134	< 1.0	-	-	1	< 1.0	34	-	0.0479	10.4	-	-			
	Bredin Pond-20140828	2014 08 28	9.01	673	-	-	-	1,830	-	1,180	13.5	-	14.5	< 100	-	-	131	1,820	273	661	477	184	< 1.0	-	-	2.32	< 1.0	64	-	0.0016	15.2	-	-			
	Bredin Pond-20150311	2015 03 11	-	721	-	-	-	1,790	-	1,110	< 3.0	-	80	1,080	-	-	120	1,190	257	638	542	96.2	< 1.0	-	-	0.965	< 0.50	22	-	0.0697	8.52	-	-			
	Bredin Pond-20150616	2015 06 16	-	623	-	-	-	1,520	-	1,040	3.2	-	11.7	< 50	-	-	113	1,170	238	639	478	162	< 1.0	-	-	0.922	< 0.50	30	-	0.0045	9.01	-	-			
	Bredin Pond-20151029	2015 10 29	9.27	553	-	-	-	1,560	-	980	< 3.0	-	34.1	356	-	-	107	1,100	216	574	390	184	< 1.0	-	-	0.938	< 0.50	32	-	0.0184	8.55	-	-			
	BREDIN POND-20160518	2016 05 18	-	506	-	-	-	1,380	-	838	< 3.0	-	18.3	< 25	-	-	98.4	1,030	200	520	183	337	< 1.0	-	-	0.73	< 0.25	24	-	0.0048	8.31	-	-			
	BREDIN POND-20160914	2016 09 14	-	597	-	-	-	1,540	-	980	< 3.0	-	8.5	< 50	-	-	112	1,190	222	592	421	171	< 1.0	-	-	0.866	< 0.50	38	-	< 0.0010	11.1	-	-			
	BREDIN POND-20161116	2016 11 16	8.52	611	-	-	-	1,670	-	1,080	< 3.0	-	75.3	419	-	-	110	1,160	252	611	572	38.8	< 1.0	-	-	0.895	< 0.50	36	-	0.008	9.28	-	-			
	BREDIN POND-20170418	2017 04 18	8.63	684	-	-	-	1,770	-	1,180	< 3.0	-	61.8	192	-	-	113	1,060	271	659	597	61.8	< 1.0	-	-	1.34	< 0.50	35	-	0.0033	11	-	-			
	BREDIN POND-20170607	2017 06 07	8.72	732	-	-	-	1,880	-	1,170	4.9	-	73.6	< 50	-	-	125	1,250	306	705	619	86.4	< 1.0	-	-	0.976	< 0.50	28	-	0.0213	10.6	-	-			
	BREDIN POND-20170907	2017 09 07	8.73	685	-	-	-	1,810	-	1,190	22.4	-	308	< 50	-	-	145	1,150	252	654	570	83.8	< 1.0	-	-	3.61	< 0.50	71	-	< 0.0010	19	-	-			
	BREDIN POND-20171101	2017 11 01	8.41	649	-	-	-	1,720	-	1,030	3	-	215	939	-	-	145	1,220	223	617	591	26.6	< 1.0	-	-	1.19	< 0.50	21	-	0.0284	7	-	-			
	BREDIN POND-180404	2018 04 04	8.77	580	9.08	9.4	1,450	1,235	918	65.3	-	3.27	176	897	< 10	897	128	870	144	477	389	88.2	< 1.0	44.1	-	2.37	0.17	76	0.0108	-	9.18	1.00	-			
	BREDIN POND-180523	2018 05 23	8.36	604	8.7	21.6	1,710	1,764	1,070	< 3.3	-	2.69	449	1,360	48	1,410	153	450	211	519	504	14.7	< 1.0	7.4	-	1.28	< 0.10	< 20	0.100	-	7.65	0.257	-			
	BREDIN POND-180906	2018 09 06	8.87	581	9.03	19.4	1,560	1,580	1,020	3.4	-	1.90	439	556	39	595	129	870	206	471	471	< 1.0	< 1.0	< 1.0	-	1.30	< 0.10	58	< 0.0050	-	10.8	0.159	-			
	BREDIN POND-181107	2018 11 07	8.31	586	8.24	8	1,600	1,389	964	2.6	-	2.60	880	1,110	82	1,190	149	760	207	509	501	7.3	< 1.0	3.6	-	1.42	< 1.00	29	0.0653	-	7.15	0.172	-			
	BREDIN POND-190329	2019 03 29	8.24	640	8.16	8.8	1,680	1,418	986	2.3	-	2.98	128	2,150	18	2,170	142	830	197	556	-	< 1.0	< 1.0	< 1.0	556	0.810	0.15	21	0.108	-	6.38	0.253	-			
	BREDIN POND-190605	2019 06 05	8.84	750	8.62	21.7	1,880	1,671	1,330	3.0	-	0.875	54	33	16	48.6	160	880	296	653	451	202	< 1.0	101	-	0.826	< 0.10	< 20	< 0.0050	-	8.11	0.288	-			
	BREDIN POND-190904	2019 09 04	9.17	721	9.63	21.6	1,870	1,715	1,220	5.0	9.45	1.04	135	< 10	< 10	< 10.0	178	980	281	624	328	296	< 1.0	148	-	1.04	< 0.10	27	-	0.0068	10.5	0.112	-			
	BREDIN POND-191023	2019 10 23	8.60	663	9.43	9.6	1,790	1,788	1,120	7.7	6.89	1.53	42	562	15	577	169	840	224	557	557	< 1.0	< 1.0	< 1.0	-	0.950	< 0.10	22	-	< 0.0050	7.25	0.0803	-			
	BREDINPOND-200407	2020 04 07	8.44	627	9.05	8.8	1,630	1,470	1,040	7.2	5.93	1.92	206	664	21	685	166	680	184	481	452	29.3	< 1.0	14.6	-	1.24	< 0.10	< 20	-	< 0.0050	6.84	0.0920	-			
	BREDINPOND-200605	2020 06 05	8.80	565	8.76	19.4	1,460	1,344	935	2.0	6.99	0.615	< 50	< 10	< 10	< 10.0	159	600	155	493	356	137	< 1.0	68.5	-	0.615	0.12	< 20	-	< 0.0050	7.04	0.0593	-			
	BREDINPOND-200917	2020 09 17	8.89	736	8.98	21.6	1,860	1,945	1,270	21.2	11.7	2.25	84	< 10	< 10	-	164	970	280	608	409	199	< 1.0	99.3	-	2.25	< 0.10	62	-	< 0.0050	13.4	0.146	-			
	BREDINPOND-201028	2020 10 28	8.62	755	8.85	5.5	2,010	2,025	1,300	18.7	14.8	3.06	115	301	79	380	157	990	296	664	559	105	< 1.0	52.4	-	2.68	< 0.10	53	-	< 0.0050	14.8	0.219	-			
	BREDIN POND-210323	2021 03 23	8.50	696	8.90	6.7	1,590	1,736.0	1,070	22.0	8.39	1.44	< 50	195	< 10	195	151	780	209	568	528	39.5	< 1.0	19.7	-	1.25	< 1.00	50								

Table 3: Historical Summary of Analytical Results For Surface Water - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters																	Dissolved Inorganics														
			pH	Hardness	pH (field)	Temperature	Conductivity	Field Conductivity	Total Dissolved Solids	Total Suspended Solids	Dissolved Organic Carbon	Total Nitrogen-N	Ammonia, Total (as N)	Nitrate (as N)	Nitrite (as N)	Nitrate+Nitrite Nitrogen	Chloride	Fluoride	Sulfate	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Phenolphthalein (as CaCO3)	Bicarbonate	Kjeldahl Nitrogen-N	Bromide	Chemical Oxygen Demand	Phosphate	Ortho-Phosphate	Total Organic Carbon	Total Phosphorous as P		
NORTHEAST POND (Cont'd)	NE Pond-20150311	2015 03 11	-	810	-	-	2,240	-	1,510	8.8	-	-	180	< 100	-	-	143	1,390	413	791	660	131	< 1.0	-	-	1.59	< 1.0	44	-	0.199	12.8	-		
	NE Pond-20150616	2015 06 16	-	870	-	-	2,240	-	1,670	3.4	-	-	15.1	< 100	-	-	155	1,540	486	888	727	161	< 1.0	-	-	1.28	< 1.0	49	-	0.307	14.1	-		
	NE Pond-20151029	2015 10 29	9.08	941	-	-	2,780	-	2,060	3.6	-	-	50.3	< 100	-	-	183	1,540	551	949	690	258	< 1.0	-	-	1.58	< 1.0	55	-	0.146	16.9	-		
	NE POND-20160914	2016 09 14	-	1,060	-	-	3,160	-	2,310	14.1	-	-	26.4	< 100	-	-	212	1,820	744	1,090	871	217	< 1.0	-	-	2.71	< 1.0	74	-	0.125	20.6	-		
	NE POND-20161116	2016 11 16	8.47	1,010	-	-	2,960	-	2,130	4.5	-	-	2,090	< 100	-	-	185	1,560	644	992	939	53	< 1.0	-	-	3.17	< 1.0	52	-	0.357	15.9	-		
	NE POND-20170418	2017 04 18	8.62	944	-	-	2,460	-	1,630	3.6	-	-	73.4	< 100	-	-	146	1,320	539	852	766	85.4	< 1.0	-	-	1.11	< 1.0	33	-	0.085	13	-		
	NE POND-20170607	2017 06 07	8.86	967	-	-	2,500	-	1,730	6.9	-	-	11.2	< 100	-	-	155	1,560	586	876	719	157	< 1.0	-	-	1.05	< 1.0	35	-	0.3	15	-		
	NE POND-20170907	2017 09 07	9.31	1,050	-	-	2,790	-	2,070	4.2	-	-	71.8	< 100	-	-	192	1,570	685	933	530	403	< 1.0	-	-	2.13	< 1.0	57	-	0.15	20.7	-		
	NE POND-20171101	2017 11 01	9.11	1,060	-	-	2,740	-	1,980	3.6	-	-	122	< 100	-	-	207	1,790	676	945	651	294	< 1.0	-	-	1.32	< 1.0	53	-	0.226	15.8	-		
	NE SAMPLE-20160518	2016 05 18	-	913	-	-	2,760	-	1,950	< 3.0	-	-	21.9	< 100	-	-	167	1,440	598	943	747	196	< 1.0	-	-	1.29	< 1.0	47	-	0.172	17.2	-		
	NORTHEAST POND-180404	2018 04 04	8.81	961	8.95	8.8	2,400	1,965	1,670	6.4	-	0.955	40	17	< 10	16.8	13.2	1,210	483	757	568	189	< 1.0	94.3	-	0.938	0.48	59	0.133	-	12.8	0.480		
	NORTHEAST POND-180523	2018 05 23	8.80	937	8.72	24.1	2,440	2,436	1,740	< 2.5	-	0.988	67	< 10	< 10	< 10.0	133	920	431	717	542	175	< 1.0	87.6	-	0.988	< 0.10	< 20	0.0154	-	13.8	0.0810		
	NORTHEAST POND-180906	2018 09 06	8.52	1,180	8.84	17.91	3,100	385	2,210	106	-	3.40	154	< 100	< 100	< 100	176	2,260	518	1,120	1,020	99.6	< 1.0	49.8	-	3.40	< 1.00	116	0.0660	-	20.8	1.24		
	NORTHEAST POND-181107	2018 11 07	8.45	1,030	8.61	7.7	2,170	2,050	1,570	41.5	-	2.37	133	< 10	< 10	< 10.0	164	1,360	456	787	725	61.8	< 1.0	30.9	-	2.37	< 1.00	67	0.0951	-	18.3	0.452		
	Northeast Pond	2019 03 29	8.49	724	8.72	10.9	1,910	1,577	1,080	28.5	-	1.36	24	< 10	< 10	< 10.0	113	1,010	349	603	-	46.7	< 1.0	23.4	556	1.36	0.23	49	0.109	-	8.16	0.383		
	Northeast Pond	2019 06 05	8.60	1,010	8.33	22.4	2,570	2,267	1,800	7.2	-	1.33	195	< 10	< 10	< 10.0	161	1,260	506	858	712	146	< 1.0	72.9	-	1.33	< 0.10	32	< 0.0050	-	12.1	0.310		
	Northeast Pond	2019 09 04	8.98	1,040	9.62	19.8	2,620	2,484	1,710	8.7	14.0	1.22	60	< 10	< 10	< 10.0	180	1,670	546	907	584	323	< 1.0	161	-	1.22	< 0.10	40	-	< 0.0050	14.5	0.144		
	NE Pond	2019 10 23	8.52	1,040	9.04	9	2,710	2,659	1,850	3.8	11.2	1.25	225	224	< 10	224	194	1,600	523	987	987	< 1.0	< 1.0	< 1.0	-	1.02	< 0.10	35	-	< 0.0050	11.5	0.347		
	NEPOND-200407	2020 04 07	8.46	1,000	9	9.3	2,470	2,264	1,810	2.4	11.0	0.863	< 50	< 10	< 10	< 10.0	167	1,370	543	821	753	68.3	< 1.0	34.2	-	0.863	< 0.10	34	-	< 0.0050	11.0	0.314		
	NEPOND-200605	2020 06 05	8.72	1,050	8.67	20.2	2,460	2,311	1,820	3.2	14.5	1.33	199	< 10	< 10	< 10.0	160	1,310	488	870	662	208	< 1.0	104	-	1.33	< 0.10	48	-	0.104	15.2	0.357		
	NEPOND-200918	2020 09 18	8.82	1,030	8.85	18.4	2,750	2,914	2,380	10.2	25.8	3.66	422	< 10	< 10	-	194	1,660	541	992	703	289	< 1.0	144	-	3.66	0.26	93	-	0.0212	26.3	0.457		
	NEPOND-201028	2020 10 28	8.50	1,030	8.69	4.5	2,660	2,758	1,580	12.4	18.4	2.33	180	31	< 10	31.1	139	1,220	397	907	798	109	< 1.0	54.5	-	2.30	< 0.10	69	-	< 0.0050	19.0	0.322		
	NE POND-210323	2021 03 23	8.42	963	8.5	6.5	2,200	2,392.0	1,640	6.0	12.4	0.965	< 50	< 10	< 10	< 10.0	143	1,380	424	851	801	50.0	< 1.0	25.0	-	0.965	< 1.00	42	-	< 0.0050	14.1	0.243		
	NE POND-210616	2021 06 16	8.89	1,080	8.83	23.6	2,420	2,729	1,800	9.2	13.4	1.43	112	< 10	< 10	< 10.0	186	1,660	541	990	724	266	< 1.0	133	-	1.43	< 0.10	45	-	< 0.0050	13.8	0.227		
	NE POND-211019	2021 10 19	8.60	1,220	8.70	10.8	2,960	2,980.8	2,040	-	14.8	1.95	735	< 10	25	25.0	201	1,840	569	1,020	846	172	< 1.0	86.2	-	1.92	< 1.00	41	-	< 0.0500	17.0	0.218		
SLOUGH	Alki Lake-20080506	2008 05 06	9.49	-	-	-	20,000	-	17,500	-	-	-	490	23	-	-	1,050	-	4,680	7,420	-	-	-	-	-	13.1	-	556	-	< 1.00	285	-		
	Alki Lake-20080507	2008 05 07	-	-	-	-	-	-	-	242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Alki Lake-20080520	2008 05 20	9.43	1,070	-	-	22,000	-	18,400	88	-	-	1,770	25	-	-	1,130	-	4,980	8,220	-	-	-	-	-	20.8	-	440	-	< 1.00	307	-		
	Alki Lake-20091119	2009 11 19	-	1,120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Slough-20010619	2001 06 19	-	-	-	-	-	-	24,200	-	-	-	-	-	-	-	-	-	6,850	-	-	-	-	-	-	-	-	-	-	-	260	-		
	Slough-20010815	2001 08 15	-	-	-	-	-	-	53,500	-	-	-	-	-	-	-	-	-	17,800	-	-	-	-	-	-	-	-	-	-	-	810	-		
	Slough-20010920	2001 09 20	-	-	-	-	-	-	91,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,440	-		
	Slough-20090521	2009 05 21	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Slough-20130429	2013 04 29	9.51	715	-	-	20,000	-	18,000	154	-	-	1,330	< 500	-	-	1,260	2,700	5,110	-	-	-	-	-	-	-	12.8	618	-	5.65	163	-		
	Slough-20130528	2013 05 28	9.46	789	-	-	22,400	-	20,100	72.7	-	-	428	< 500	-	-	1,480	831	6,030	-	-	-	-	-	-	-	10.5	559	-	6.54	187	-		
	Slough-20130718	2013 07 18	9.65	803	-	-	27,200	-	25,900	356	-	-	364	< 500	-	-	1,780	996	7,630	9,320	4,000	5,320	< 5.0	-	-	36.9	17.2	920	-	6.3	251	-		
	Slough-20131016	2013 10 16	9.73	567	-	-	38,900	-	37,600	142	-	-	998	< 500	-	-	2,740	< 2,000a	12,100	15,200	6,010	9,190	< 100	-	-	24.4	20.1	1,050	-	10.5	286	-		
	Slough-20140331	2014 03 31	9.46	531	-	-	9,940	-	7,580	34.8	-	-	1,310	< 250	-	-	621	< 1,000	2,360	2,760	1,560	1,200	< 1.0	-	-	9.17	5.4	294	-	2.21				

Table 3: Historical Summary of Analytical Results For Surface Water - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters																	Dissolved Inorganics																
			pH	Hardness mg/L	pH (field)	C Temperature	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Total Suspended Solids mg/L	Dissolved Organic Carbon mg/L	Total Nitrogen-N mg/L	Ammonia, Total (as N) µg/L	Nitrate (as N) µg/L	Nitrite (as N) µg/L	Nitrate+Nitrite Nitrogen µg/L	Chloride mg/L	Fluoride µg/L	Sulfate mg/L	Total Alkalinity mg/L	Alkalinity, Bicarbonate (as CaCO3) mg/L	Alkalinity, Carbonate (as CaCO3) mg/L	Alkalinity, Hydroxide (as CaCO3) mg/L	Alkalinity, Phenolphthalein (as CaCO3) mg/L	Bicarbonate mg/L	Kjeldahl Nitrogen-N mg/L	Bromide mg/L	Chemical Oxygen Demand	Phosphate mg/L	Ortho-Phosphate mg/L	Total Organic Carbon mg/L	Total Phosphorous as P mg/L				
SLOUGH (Cont'd)	SLOUGH-20170607	2017 06 07	9.04	738	-	-	7,660	-	5,880	11.3	-	-	574	< 250	-	-	504	< 1,000	2,010	2,160	1,650	505	< 1.0	-	-	-	6.85	4.1	245	-	2.54	89	-			
	SLOUGH-20170907	2017 09 07	9.03	1,070	-	-	13,500	-	11,000	15.8	-	-	1,090	< 500	-	-	944	< 2,000a	3,580	4,700	3,410	1,300	< 1.0	-	-	17.2	5.6	644	-	5.6	232	-				
	SLOUGH-20171101	2017 11 01	9.1	1,210	-	-	15,000	-	12,000	39.6	-	-	701	< 500	-	-	1,060	< 2,000a	3,980	4,050	2,820	1,220	< 1.0	-	-	19.4	6.8	630	-	5.68	261	-				
	SLOUGH-180404	2018 04 04	8.94	744	8.85	10.5	3,660	2,328	2,440	41.0	-	9.47	168	1,080	108	1,190	274	660	791	902	656	246	< 1.0	123	-	8.28	1.09	250	1.00	-	65.1	2.78				
	SLOUGH-180523	2018 05 23	8.82	840	8.63	26.3	6,050	6,029	4,440	11.5	-	10.5	1,330	< 250	< 10	< 250	391	590	1,310	1,540	1,220	322	< 1.0	161	-	10.5	< 2.50	299	2.57	-	117	3.46				
	SLOUGH-180906	2018 09 06	9.02	1,170	9.16	18.9	12,100	11,069	10,200	26.2	-	20.0	516	< 100	< 100	< 100	695	1,230	2,480	3,480	3,480	< 1.0	< 1.0	< 1.0	-	20.0	3.90	627	2.28	-	306	6.33				
	SLOUGH-181107	2018 11 07	9.04	1,120	8.97	7.4	6,930	6,117	5,520	41.2	-	12.5	926	101	< 100	101	544	< 1,000	1,910	1,830	1,270	552	< 1.0	276	-	12.4	1.14	355	1.94	-	193	2.67				
	Slough	2019 03 29	8.94	662	9.11	9.8	3,670	3,169	2,470	20.0	-	6.49	138	< 100	< 100	< 100	257	< 1,000	766	946	-	245	< 1.0	122	701	6.49	< 1.00	176	0.797	-	53.0	1.44				
	Slough	2019 06 05	8.92	879	8.69	21	6,270	5,270	4,620	14.8	-	8.16	627	< 100	< 100	< 100	438	< 1,000	1,470	1,660	1,230	435	< 1.0	217	-	8.16	< 1.00	241	0.814	-	89.2	2.34				
	Slough	2019 09 04	9.11	1,010	9.21	21.3	10,200	9,072	7,930	43.7	135	13.5	281	< 100	< 100	< 100	748	< 1,000	2,460	2,590	1,740	848	< 1.0	424	-	13.5	2.95	399	-	1.12	139	2.65				
	Slough	2019 10 23	9.14	1,090	9.44	11	10,200	9,820	8,030	97.7	132	13.7	408	< 100	< 100	< 100	759	< 1,000	2,560	2,430	2,430	< 1.0	< 1.0	< 1.0	-	13.7	3.50	525	-	0.825	142	3.61				
	SLOUGH-200407	2020 04 07	9.03	778	9.41	9.9	5,070	4,428	3,770	37.5	74.6	9.78	192	< 10	< 10	< 10.0	365	500	1,210	1,170	810	365	< 1.0	182	-	9.78	1.44	281	-	0.360	84.3	1.67				
	SLOUGH-200605	2020 06 05	9.02	867	9.01	20.6	5,220	5,012	4,260	18.4	78.6	6.93	382	< 10	34	33.8	385	530	1,280	1,430	973	457	-	229	-	6.89	1.62	199	-	0.864	80.0	1.77				
	SLOUGH-200918	2020 09 18	9.61	893	9.63	18.6	8,600	9,004	7,100	13.8	117	7.88	211	< 10	< 10	-	699	710	2,280	2,100	821	1,280	-	642	-	7.88	< 2.50	291	-	< 0.0050	119	0.196				
	SLOUGH-201028	2020 10 28	9.29	895	9.56	3.6	8,480	8,543	6,200	39.7	121	10.7	115	< 250	< 10	< 250	648	590	2,080	2,010	1,140	864	-	432	-	10.7	< 2.50	291	-	< 0.0050	137	1.19				
	SLOUGH-210323	2021 03 23	8.78	918	9.03	8.5	3,900	4,350	3,190	30.4	50.2	4.50	559	< 100	< 100a	< 100	322	< 1,000	941	1,070	827	247	-	124	-	4.50	1.07	154	-	0.205	53.2	0.830				
	Slough	2021 06 17	8.74	1,170	8.73	19.4	5,850	6,399.0	4,980	34.4	66.5	8.12	2,460	< 100	< 100a	< 100	439	< 1,000	1,590	1,590	1,270	317	-	158	-	8.12	1.44	214	-	1.21	72.4	1.37				
	SLOUGH-210921	2021 09 21	9.25	2,050	9.23	17.5	12,500	12,713.0	9,900	-	125	16.2	331	< 100	< 100a	< 100	1,040	< 1,000	3,840	2,910	1,630	1,280	-	642	-	16.2	3.70	455	-	0.221	127	1.83				
	SLOUGH-211020	2021 10 20	9.33	1,650	9.52	8.7	13,200	12,068	8,700	-	132	17.2	255	< 100	< 100a	< 100	911	< 1,000	3,380	2,890	1,550	1,340	-	672	-	17.2	3.45	489	-	0.110	134	2.18				
TUTT POND	Tutt Pond-20010611	2001 06 11	-	-	-	-	-	-	630	-	-	-	-	-	-	-	-	89	-	-	-	-	-	-	-	-	-	-	-	-	31.7	-				
	Tutt Pond-20010815	2001 08 15	-	-	-	-	-	-	4,140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-				
	Tutt Pond-20010920	2001 09 20	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	1,200	-	-	-	-	-	-	-	-	-	-	-	14.8	-				
	Tutt Pond-20080506	2008 05 06	8.35	-	-	-	2,130	-	1,320	-	-	-	240	65	-	-	123	-	318	605	-	-	-	-	-	1.07	-	28	-	0.15	18.1	-				
	Tutt Pond-20080507	2008 05 07	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Tutt Pond-20080520	2008 05 20	8.3	850	-	-	2,000	-	1,420	2	-	-	230	60	-	-	142	-	371	636	-	-	-	-	-	1.58	-	31	-	0.3	20	-				
	Tutt Pond-20090521	2009 05 21	-	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Tutt Pond-20091119	2009 11 19	-	967	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Tutt Pond-20130429	2013 04 29	8.65	831	-	-	2,340	-	1,620	7.1	-	-	335	< 100	-	-	176	1,300	529	-	-	-	-	-	-	-	-	< 1.0	35	-	0.355	12.6	-			
	Tutt Pond-20130528	2013 05 28	8.71	894	-	-	2,460	-	1,670	3.3	-	-	81.6	< 100	-	-	182	900	540	-	-	-	-	-	-	-	-	< 1.0	37	-	0.33	11.6	-			
	Tutt Pond-20130718	2013 07 18	8.82	869	-	-	2,430	-	1,560	3	-	-	20	< 100	-	-	184	1,300	542	665	535	130	< 1.0	-	-	1.26	< 1.0	36	-	0.273	12.3	-				
	Tutt Pond-20130819	2013 08 19	8.69	874	-	-	2,540	-	1,720	3.9	-	-	52	< 100	-	-	191	1,430	566	699	584	116	< 1.0	-	-	1.43	< 1.0	44	-	0.353	13.5	-				
	Tutt Pond-20130911	2013 09 11	8.82	906	-	-	2,550	-	1,920	16.3	-	-	18.5	< 100	-	-	197	970	573	739	623	116	< 1.0	-	-	1.98	< 1.0	53	-	0.43	16.7	-				
	Tutt Pond-20131016	2013 10 16	8.5	943	-	-	2,700	-	1,920	< 3.0	-	-	1,520	< 100	-	-	205	820	623	764	733	31.6	< 1.0	-	-	2.67	< 1.0	38	-	0.679	13.3	-				
	Tutt Pond-20140331	2014 03 31	8.56	923	-	-	2,510	-	1,690	3.1	-	-	440	530	-	-	190	920	565	710	637	73.4	< 1.0	-	-	1.63	< 1.0	34	-	0.332	11.8	-				
	Tutt Pond-20140528	2014 05 28	8.68	984	-	-	2,680	-	1,810	3	-	-	48.4	< 100	-	-	204	1,190	693	710	614	96.7	< 1.0	-	-	0.977	< 1.0	35	-	0.187	11.4	-				
	Tutt Pond-20140731	2014 07 31	8.79	964	-	-	2,740	-	1,940	< 3.0	-	-	63	< 100	-	-	219	1,240	753	674	531	143	< 1.0	-	-	1.24	< 1.0	44	-	0.236	13.4	-				
	Tutt Pond-20140828	2014 08 28	8.78	967	-	-	2,870	-	2,140	15.4	-	-	15.7	< 100	-	-	232	1,510	780	705	564	141	< 1.0	-	-	1.36	< 1.0	52	-	0.277	13.1	-				
	Tutt Pond-20140930	2014 09 30	8.54	999	-	-	2,680	-	1,840	< 3.0	-	-	1,160	< 100	-	-	214	1,280	706	720	649	71.9	< 1.0	-	-	2.37	&									

Table 3: Historical Summary of Analytical Results For Surface Water - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters																	Dissolved Inorganics																
			pH	Hardness mg/L	pH (field)	C Temperature	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Total Suspended Solids mg/L	Dissolved Organic Carbon mg/L	Total Nitrogen-N mg/L	Ammonia, Total (as N) µg/L	Nitrate (as N) µg/L	Nitrite (as N) µg/L	Nitrate+Nitrite Nitrogen µg/L	Chloride mg/L	Fluoride µg/L	Sulfate mg/L	Total Alkalinity mg/L	Alkalinity, Bicarbonate (as CaCO3) mg/L	Alkalinity, Carbonate (as CaCO3) mg/L	Alkalinity, Hydroxide (as CaCO3) mg/L	Alkalinity, Phenolphthalein (as CaCO3) mg/L	Bicarbonate mg/L	Kjeldahl Nitrogen-N mg/L	Bromide mg/L	Chemical Oxygen Demand mg/L	Phosphate mg/L	Ortho-Phosphate mg/L	Total Organic Carbon mg/L	Total Phosphorous as P mg/L				
TUTT POND (Cont'd)	TUTT POND-20171101	2017 11 01	8.39	1,100	-	-	2,930	-	2,100	6	-	-	973	150	-	-	216	990	852	780	749	31.4	< 1.0	-	-	2.2	< 1.0	36	-	0.502	12.8	-				
	TUTT POND-180404	2018 04 04	8.68	792	8	6.6	1,970	2,158	1,390	63.3	-	1.93	135	11	< 10	11.2	141	720	409	476	401	74.8	< 1.0	37.4	-	1.92	0.24	73	0.0069	-	14.3	0.388				
	TUTT POND-180417	2018 04 17	8.64	799	8.66	9.3	2,080	2,184	1,470	22.7	-	12.6	39	4,930	< 10	4,930	145	570	443	510	449	61.2	< 1.0	30.6	-	7.67	0.18	34	< 0.0050	-	11.0	0.0651				
	TUTT POND-180503	2018 05 03	8.62	681	8.02	6.1	1,740	1,539	1,110	< 5.0	-	3.13	442	584	22	606	157	650	225	475	413	61.2	< 1.0	30.6	-	2.52	< 0.10	24	0.0240	-	10.6	0.0873				
	TUTT POND-180523	2018 05 23	8.46	708	8.49	22.4	1,930	1,987	1,210	< 2.0	-	2.11	161	803	65	868	182	540	276	530	500	30.3	< 1.0	15.2	-	1.24	< 0.10	< 20	0.0578	-	9.64	0.227				
	TUTT POND-180615	2018 06 15	8.46	831	8.83	17.9	2,140	1,821	1,420	7.3	-	2.15	78	225	32	256	174	930	364	573	539	33.7	< 1.0	16.9	-	1.89	0.21	44	0.0180	-	10.6	0.232				
	TUTT POND-180712	2018 07 12	8.82	748	9.04	23.7	2,050	1,902	1,410	3.0	-	1.01	46	< 100	< 10	< 100	160	830	354	586	433	152	< 1.0	76.2	-	1.01	< 1.00	32	0.0821	-	11.6	0.197				
	TUTT POND-180906	2018 09 06	8.64	857	8.9	18.7	2,300	228.3	1,620	15.2	-	1.46	337	157	< 100	157	177	1,280	507	527	441	85.9	< 1.0	42.9	-	1.30	< 1.00	49	< 0.0500	-	14.2	0.362				
	TUTT POND-181107	2018 11 07	8.39	909	8.37	7.9	2,150	1,882	1,400	8.4	-	1.71	297	500	53	552	175	790	504	586	562	23.9	< 1.0	11.9	-	1.16	< 1.00	39	0.132	-	11.1	0.322				
	Tutt Pond	2019 03 29	8.22	792	8.33	9.00	1,940	1,618	1,230	12.3	-	2.50	248	1,180	23	1,200	136	600	396	498	-	< 1.0	< 1.0	< 1.0	498	1.30	0.13	28	0.230	-	7.49	0.472				
	Tutt Pond	2019 05 06	8.47	975	8.5	17.3	2,400	2,076	1,660	5.4	-	1.02	191	64	12	75.3	192	650	636	628	582	46.6	< 1.0	23.3	-	0.944	0.16	45	0.0646	-	9.54	0.233				
	Tutt Pond	2019 06 05	8.69	865	8.67	21.6	2,260	2,031	1,690	4.6	-	1.27	94	174	14	188	182	740	484	664	525	139	< 1.0	69.6	-	1.08	< 0.10	31	0.0075	-	9.46	0.330				
	Tutt Pond	2019 09 04	8.76	912	8.84	21.3	2,500	2,312	1,660	10.7	12.1	1.37	181	< 10	< 10	< 10.0	202	870	565	680	510	170	< 1.0	85.1	-	1.37	< 0.10	52	-	0.0082	13.0	0.343				
	Tutt Pond	2019 10 23	8.48	1,040	8.76	9.3	2,860	2,818	2,080	3.0	11.3	1.74	669	44	42	86.6	211	820	723	688	688	< 1.0	< 1.0	< 1.0	-	1.65	< 0.10	32	-	0.0988	11.3	0.494				
	TUTT POND-200407	2020 04 07	8.40	842	8.95	8	2,330	2,032	1,630	4.4	8.99	1.02	132	15	< 10	14.8	199	690	536	551	523	28.4	< 1.0	14.2	-	1.00	< 0.10	29	-	0.0128	9.20	0.124				
	TUTT POND-200605	2020 06 05	8.68	819	8.72	19.1	2,140	1,981	1,560	3.4	10.5	0.947	< 50	< 10	< 10	< 10.0	189	640	442	608	468	140	< 1.0	70.1	-	0.947	0.16	35	-	0.0982	11.0	0.312				
	TUTT POND-200918	2020 09 18	8.58	917	8.7	19.1	2,520	2,688	2,050	3.0	16.2	1.38	226	< 10	< 10	-	212	840	591	665	558	108	< 1.0	53.8	-	1.38	< 1.00	53	-	0.0431	16.4	0.306				
	TUTT POND-201028	2020 10 28	8.12	1,130	8.07	6.1	3,050	3,131	2,040	9.3	19.4	3.16	1,590	10	< 10	10.2	227	790	788	748	748	< 1.0	< 1.0	< 1.0	-	3.14	0.26	48	-	< 0.0050	19.4	0.935				
	TUTT POND-210323	2021 03 23	8.42	990	8.63	7.7	2,250	2,541	1,780	9.2	7.67	1.32	< 50	< 10	< 10	< 10.0	185	670	573	624	589	35.2	< 1.0	17.6	-	1.32	< 1.00	46	-	< 0.0050	11.7	0.164				
	TUTT POND-210616	2021 06 16	8.53	1,140	8.49	20.0	2,670	2,976.0	2,180	3.6	15.7	1.49	169	< 10	< 10	< 10.0	240	780	752	771	654	117	< 1.0	58.4	-	1.49	< 0.10	46	-	< 0.0050	15.8	0.371				
	TUTT POND-210921	2021 09 21	8.62	1,250	8.56	15.9	3,180	3,201.0	2,340	-	12.6	1.43	153	< 10	< 10	< 10.0	258	800	926	698	568	130	< 1.0	65.0	-	1.43	< 0.10	< 20	-	0.0127	12.7	0.231				
	TUTT POND-211020	2021 10 20	8.49	1,270	8.54	10.1	3,330	2,967.0	2,370	-	14.2	1.12	244	< 100	< 100a	< 100	272	< 1,000	818	721	651	69.9	< 1.0	34.9	-	1.12	< 1.00	37	-	< 0.0500	14.6	0.453				
	BUBNA SLOUGH	Bubna Slough-20150616	2015 06 16	-	1,280	-	-	4,340	-	3,250	12.8	-	-	26.2	< 250	-	-	1,000	< 1,000	623	857	693	165	< 1.0	-	-	2.52	< 2.5	145	-	< 0.0010	43.9	-			
		BUBNA DISCHARGE-180420	2018 04 20	8.29	858	-	-	2,810	-	1,900	3.5	-	1.33	30	< 10	< 10	< 10.0	555	320	214	548	548	< 1.0	< 1.0	< 1.0	-	1.33	< 0.10	75	< 0.0050	-	20.6	0.0457			
		BUBNA DISCHARGE-180503	2018 05 03	8.56	963	8.08	15.6	2,920	2,584	1,850	5.7	-	1.41	56	< 1,000	< 10	< 1,000	476	360	170	561	495	65.7	< 1.0	32.9	-	1.41	< 0.10	69	< 0.0050	-	24.1	0.0172			
		BUBNA DISCHARGE-180615	2018 06 15	8.91	940	9.06	15.7	2,950	2,484	5,980	3.8	-	1.97	23	< 10	< 10	< 10.0	542	410	201	516	355	161	< 1.0	80.3	-	1.97	0.19	87	< 0.0050	-	27.6	0.0325			
		BUBNA SLOUGH-181108	2018 11 08	8.36	1,110	8.43	3.1	3,330	3,359	2,200	4.7	-	1.32	38	< 100	< 100	< 10.0	630	< 1,000	268	661	639	21.6	< 1.0	10.8	-	1.32	< 1.00	75	< 0.0500	-	24.5	0.0336			
		Bubna	2019 03 29	8.39	300	8.56	10.9	1,060	866	559	5.0	-	0.760	41	< 10	< 10	< 10.0	173	150	58.8	218	-	5.8	< 1.0	2.9	212	0.760	< 0.10	27	< 0.0050	-	6.68	0.0417			
		Bubna	2019 05 06	8.71	961	8.41	19.2	3,050	2,559	1,790	16.0	-	1.57	90	< 10	< 10	< 10.0	573	340	207	646	514	132	< 1.0	66.1	-	1.57	0.13	74	< 0.0050	-	27.9	0.0372			
		BUBNASLOUGH-200407	2020 04 07	8.33	819	8.66	8.7	2,620	2,431	1,710	2.8	20.9	1.02	< 50	< 10	< 10	< 10.0	506	320	158	502	489	12.3	< 1.0	6.2	-	1.02	< 0.10	53	-	< 0.0050	21.2	0.0165			
		BUBNASLOUGH-200605	2020 06 05	8.44	724	8.44	19.8	2,690	2,573	1,790	3.8	24.7	1.36	78	< 10	< 10	< 10.0	540	320	166	627	572	54.7	< 1.0	27.4	-	1.36	< 0.10	66	-	< 0.0050	25.3	0.0216			
		BUBNASLOUGH-200928	2020 09 28	8.28	897	7.97	14.9	3,200	3,317	2,070	2.6	21.3	1.66	285	< 100	< 100	-	635	< 1,000	213	655	655	< 1.0	< 1.0	< 1.0	-	1.66	< 1.00	62	-	< 0.0500	30.2	0.0156			
		BUBNASLOUGH-201029	2020 10 29	8.29	888	8.32	4.3	3,230	3,248	1,710	3.8	23.0	2.00	637	< 100	< 100	< 100	518	< 1,000	204	692	692	< 1.0	< 1.0	< 1.0	-	2.00	< 1.00	121	-	< 0.0500	25.0	0.0222			
		BUBNA SLOUGH-210412	2021 04 12	8.35	901	8.36	8.6	2,520	2,893	1,770	2.0	26.8	1.19	80	< 10	< 10	&																			

Table 3: Historical Summary of Analytical Results For Surface Water - Inorganics

Sample Location	Sample ID	Sample Date (yyyy mm dd)	pH	Hardness mg/L	pH (field)	C	Conductivity µS/cm	Field Conductivity µS/cm	Total Dissolved Solids mg/L	Total Suspended Solids mg/	Dissolved Organic Carbon mg/	Total Nitrogen-N mg/L	Ammonia, Total (as N) µg/L	Nitrate (as N) µg/L	Nitrite (as N) µg/L	Nitrate+Nitrite Nitrogen µg/L	Chloride mg/L	Fluoride µg/L	Sulfate mg/L	Dissolved Inorganics													
																				Total Alkalinity mg/L	Alkalinity, Bicarbonate (as CaCO3) mg/L	Alkalinity, Carbonate (as CaCO3) mg/L	Alkalinity, Hydroxide (as CaCO3) mg/L	Alkalinity, Phenolphthalein (as CaCO3) mg/L	Bicarbonate mg/	Kjeldahl Nitrogen-N mg/L	Bromide mg/L	Chemical Oxygen Demand mg/L	Phosphate mg/L	Ortho-Phosphate mg/L	Total Organic Carbon mg/L	Total Phosphorous as P mg/L	
LITTLE ROBERT LK Cont'	Little Robert Lk	2019 06 05	9.02	987	8.84	22.3	2,690	2,335	2,010	3.8	-	1.32	84	< 100	< 100	< 100	181	< 1,000	749	637	384	253	< 1.0	127	-	1.32	< 1.00	36	0.209	-	12.7	0.787	
	Little Robert Lk	2019 09 04	8.98	1,110	8.19	25	3,100	3,090	2,160	4.4	23.7	1.82	45	< 100	< 100	< 100	165	< 1,000	972	745	478	267	< 1.0	133	-	1.82	< 1.00	49	-	0.387	25.5	1.16	
	LITTLE ROBERT LAKE-200928	2020 09 28	8.72	1,330	8.76	14.2	4,350	4,285	3,490	15.3	24.0	2.85	211	< 100	< 100	-	115	< 1,000	1,720	675	520	155	< 1.0	77.7	-	2.85	< 1.00	93	-	0.564	27.2	1.50	
	LITTLE ROBERT LAKE-201029	2020 10 29	8.50	1,300	8.71	5	4,150	4,187	3,210	6.4	19.5	2.65	440	309	< 100	309	103	< 1,000	1,540	697	621	75.8	< 1.0	37.9	-	2.34	< 1.00	52	-	0.618	23.3	1.58	
	LTTLE ROBERT LAKE-200605	2020 06 05	8.86	1,240	8.97	20.5	3,520	3,393	3,040	8.8	23.5	1.78	< 50	< 10	< 10	< 10.0	116	430	1,630	648	414	234	< 1.0	117	-	1.78	< 1.00	50	-	0.604	25.7	0.592	
	LITTLE ROBERT LAKE-210412	2021 04 12	8.42	1,560	8.59	10.8	4,200	4,486.0	3,740	29.0	24.4	1.58	110	< 100	< 100a	< 100	100	< 1,000	1,840	749	701	47.4	< 1.0	23.7	-	1.58	< 1.00	51	-	0.953	28.3	1.67	
	Little Robert Lake	2021 06 17	9.08	1,620	9.29	20.6	4,220	4,945	4,320	30.4	16.6	1.90	< 50	< 100	< 100a	< 100	110	< 1,000	2,210	661	349	312	< 1.0	156	-	1.90	< 1.00	67	-	0.600	22.7	1.09	
	LITTLE ROBERT LAKE-210922	2021 09 22	8.61	1,630	8.61	15.0	5,370	5,225	4,310	-	24.1	1.96	340	< 100	< 100a	< 100	123	< 1,000	2,500	772	629	142	< 1.0	71.1	-	1.96	< 1.00	66	-	0.440	24.7	1.44	
ROBERT LK	LITTLE ROBERT LAKE-211021	2021 10 21	8.47	1,520	8.47	8.3	5,020	4,527.0	4,110	-	22.1	2.45	486	< 100	< 100a	< 100	110	< 1,000	2,320	770	699	70.9	< 1.0	35.5	-	2.45	< 1.00	58	-	0.442	24.4	1.35	
	Robert Lake-20150616	2015 06 16	-	1,150	-	-	12,500	-	13,700	31.1	-	-	82	< 500	-	-	346	< 2,000a	8,420	1,760	1,230	530	< 1.0	-	-	5.85	< 5.0	233	-	4.85	82.3	-	
	ROBERT'S LAKE 1-20160921	2016 09 21	9.67	1,450	-	-	21,800	-	21,300	19.7	-	-	-	< 500	-	-	524	< 2,000a	12,800	2,010	-	-	-	-	-	-	< 5.0	-	-	-	110	-	
	ROBERT LAKE - NORTH-20161117	2016 11 17	-	1,150	-	-	15,600	-	13,300	188	-	-	510	< 500	-	-	358	< 2,000a	8,640	1,410	821	592	< 1.0	-	-	7.85	< 5.0	252	-	2.94	81.7	-	
	ROBERT LAKE - SOUTH-20161117	2016 11 17	-	1,070	-	-	16,300	-	13,700	67.3	-	-	83.9	< 500	-	-	387	< 2,000a	9,250	1,440	783	661	< 1.0	-	-	8.09	< 5.0	258	-	2.6	82.1	-	
	ROBERT LK-180417	2018 04 17	8.98	1,040	8.92	11	9,100	3,334	7,730	18.0	-	3.59	47	< 10	< 10	< 10.0	161	450	3,840	1,010	714	297	< 1.0	148	-	3.59	0.80	127	1.79	-	74.0	2.21	
	ROBERT LK-180503	2018 05 03	8.98	1,090	8.58	19.3	8,740	7,684	7,330	17.0	-	4.71	119	1,350	< 10	1,350	145	520	3,850	1,010	713	296	< 1.0	148	-	3.36	< 10.0	109	1.61	-	39.7	2.45	
	ROBERT LK-180614	2018 06 14	8.97	1,200	9.19	19.1	8,000	6,915	6,690	12.8	-	3.56	98	< 100	< 100	< 100	198	< 1,000	3,490	1,020	706	316	< 1.0	158	-	3.56	< 1.00	113	1.24	-	39.9	1.99	
	ROBERT LK-180712	2018 07 12	9.02	1,120	9.22	27.2	8,110	7,162	6,820	12.6	-	3.98	66	< 10	< 10	< 10.0	205	710	3,280	1,110	766	347	< 1.0	173	-	3.98	< 0.10	115	1.02	-	49.9	2.14	
	Robert Lk	2019 03 29	9.02	685	9.25	8	5,660	636.7	3,900	17.7	-	3.72	105	< 100	< 100	< 100	140	< 1,000	2,280	763	-	231	< 1.0	115	532	3.72	< 1.00	110	0.735	-	29.2	1.44	
	Robert Lk	2019 05 06	8.92	1,060	8.6	20.9	7,900	6,464	6,200	34.7	-	5.44	139	< 10	< 10	< 10.0	209	660	3,310	1,180	859	321	< 1.0	160	-	5.44	0.94	165	1.59	-	48.4	2.22	
	Robert Lk	2019 06 05	8.85	1,130	8.62	22	8,000	6,741	6,520	27.4	-	5.64	733	< 100	< 100	< 100	212	< 1,000	3,160	1,210	898	313	< 1.0	156	-	5.64	< 1.00	143	0.988	-	45.3	2.55	
	Robert Lk	2019 09 04	8.91	1,490	8.61	26.6	10,300	10,048	8,440	42.3	53.4	5.52	372	< 100	127	127	279	< 1,000	4,350	1,660	1,210	459	< 1.0	229	-	5.40	1.14	154	-	1.61	59.8	3.71	
	ROBERTLAKE-200407	2020 04 07	8.87	1,190	9.4	14	7,620	6,679	6,240	21.7	38.2	3.64	68	< 10	< 10	< 10.0	203	590	3,350	1,170	873	294	< 1.0	147	-	3.64	< 0.10	117	-	1.26	39.3	2.95	
	ROBERTLAKE-200605	2020 06 05	8.81	1,220	8.86	21.1	7,520	735.8	7,100	147	53.3	7.34	438	< 1,000	< 10	< 1,000	193	630	3,560	1,440	1,090	349	< 1.0	175	-	7.34	< 10.0	245	-	2.70	57.5	4.96	
	ROBERTLAKE-200928	2020 09 28	8.97	1,450	8.92	15.4	10,400	10,282	8,580	32.0	60.3	6.66	1,160	< 100	107	-	262	< 1,000	4,160	1,560	1,050	516	< 1.0	258	-	6.56	< 1.00	179	-	1.88	64.1	3.47	
	ROBERTLAKE-201028	2020 10 28	8.94	1,380	9.18	4	9,880	9,840	7,960	44.7	58.4	6.80	129	< 250	79	< 250	245	630	4,160	1,580	1,100	477	< 1.0	239	-	6.72	0.98	153	-	0.869	68.3	3.47	
	ROBERT LAKE-210412	2021 04 12	8.73	1,330	9.12	11.0	7,810	8,577	7,290	60.0	38.4	6.14	204	< 100	< 100a	< 100	190	< 1,000	3,200	1,440	1,050	393	< 1.0	196	-	6.14	< 1.00	213	-	1.75	46.7	3.28	
	ROBERT LAKE-210616	2021 06 16	8.96	1,510	9.02	17.9	8,560	9,489	8,250	44.0	47.4	7.32	118	< 100	< 100a	< 100	242	< 1,000	4,110	1,690	1,150	541	< 1.0	270	-	7.32	< 1.00	234	-	1.12	57.0	3.46	
	ROBERT LAKE-210922	2021 09 22	9.12	1,980	9.12	15.7	12,800	12,687.0	9,700	-	65.6	8.96	143	< 100	< 100a	< 100	365	< 1,000	6,060	2,110	1,300	810	< 1.0	405	-	8.96	1.33	271	-	1.68	77.7	3.80	
	ROBERT LAKE-211021	2021 10 21	9.08	1,530	9.29	7.9	12,600	11,012.0	9,700	-	61.6	12.7	173	< 100	< 100a	< 100	336	< 1,000	5,790	2,020	1,290	731	< 1.0	365	-	12.7	1.22	255	-	1.37	76.1	3.82	
DIFFUSER	DIFFUSER-180417	2018 04 17	8.98	1,090	9.26	12	9,030	8,592	7,570	19.3	-	2.69	56	< 10	< 10	< 10.0	168	460	3,890	1,010	720	294	< 1.0	147	-	2.69	0.80	132	1.86	-	61.0	5.73	
	DIFFUSER-180503	2018 05 03	8.98	1,110	8.67	19.7	8,740	7,700	7,710	15.0	-	3.39	135	< 1,000	< 10	< 1,000	145	520	3,890	1,020	726	299	< 1.0	149	-	3.39	< 10.0	112	1.38	-	42.7	2.51	
	DIFFUSER-180615	2018 06 15	8.99	1,230	9.29	19.5	7,940	6,818	10,400	10.8	-	3.86	48	< 10	< 10	< 10.0	182	970	3,350	1,050	691	363	< 1.0	181	-	3.86	0.91	99	0.710	-	41.6	1.97	
JH Outfall	JH OUTFALL-180417	2018 04 17	8.68	861	8.89	10.3	2,100	2,069	1,580	28.0	-	1.53	23	486																			

Table 4: Historical Summary of Analytical Results For Surface Water - Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Total Metals																														
			pH	Total Hardness	pH (field)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Phosphorous	Potassium	Selenium	Silicon	Silver	Sodium	Strontium	Sulphur	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
BREDIN POND	Bredin Pond-20010611	2001 06 11	-	-	-	13	< 5	< 10	81	< 0.5a	10	18	< 0.5a	7,300	< 0.8	1.7	4	38	7	48	183,000	7.6	-	10	6	< 30	25,800	< 4a	2,840	< 1a	214,000	218	123,000	-	< 4a	-	< 3	2.7	-	-	8	0.8	-
	Bredin Pond-20010711	2001 07 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Bredin Pond-20010815	2001 08 15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Bredin Pond-20010816	2001 08 16	-	-	-	61	< 20a	< 50	12.5	< 3a	130	40	< 3a	7,700	< 4a	< 3	< 5a	448	34	37	170,000	7.5	-	< 5	27	< 100	20,600	< 20a	12,700	< 5a	192,000	233	115,000	-	< 20a	-	< 20	12	-	-	10	< 3	-
	Bredin Pond-20010920	2001 09 20	-	-	-	28	< 5	< 10	13.1	< 0.5a	11	< 2	< 0.5a	10,600	< 0.8	1.5	2	13	< 2	43	174,000	4	-	16	10	30	23,100	8	18,900	< 1a	209,000	371	128,000	-	< 4a	-	< 3	< 0.4	-	-	4	1	-
	Bredin Pond-20080506	2008 05 06	8.46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bredin Pond-20080507	2008 05 07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Bredin Pond-20080520	2008 05 20	8.39	728	-	-	-	-	-	-	-	-	-	-	29,100	-	-	-	-	-	-	159,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bredin Pond-20090521	2009 05 21	-	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bredin Pond-20091119	2009 11 19	-	716	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bredin Pond-20130429	2013 04 29	8.82	757	-	11	< 0.50	1	65	< 5.0a	-	< 100	< 0.050	41,200	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	159,000	21	< 0.20a	11	< 5.0	-	-	1.2	-	< 0.050	203,000	-	-	-	< 0.20	-	-	< 50	-	27.7	< 30	< 5.0	-
	Bredin Pond-20130528	2013 05 28	8.56	745	-	< 10	< 0.50	1.1	68	< 5.0a	-	< 100	< 0.050	32,700	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	161,000	60	< 0.20a	11	< 5.0	-	-	1	-	< 0.050	196,000	-	-	-	< 0.20	-	-	< 50	-	23.2	< 30	< 5.0	-
	Bredin Pond-20130718	2013 07 18	8.76	789	-	< 10	< 0.50	1.5	62	< 5.0a	-	< 100	< 0.050	40,600	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	169,000	72	< 0.20a	13	< 5.0	-	-	< 1.0	-	< 0.050	197,000	-	-	-	< 0.20	-	-	< 50	-	24.6	< 30	< 5.0	-
	Bredin Pond-20131016	2013 10 16	8.9	766	-	< 10	< 0.50	1.4	67	< 5.0a	-	< 100	< 0.050	26,700	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	170,000	< 10	< 0.20a	10.9	< 5.0	-	-	< 1.0	-	< 0.050	223,000	-	-	-	< 0.20	-	-	< 50	-	20.1	< 30	< 5.0	-
	Bredin Pond-20140331	2014 03 31	8.66	759	-	14	< 0.50	1.6	65	< 5.0a	-	< 100	< 0.050	38,600	0.51	< 0.50	< 1.0a	< 30	< 1.0	< 50	161,000	30	< 0.20a	15.2	< 5.0	-	-	1.2	-	< 0.050	195,000	-	-	-	< 0.20	-	-	< 50	-	29.5	< 30	< 5.0	-
	Bredin Pond-20140528	2014 05 28	8.86	754	-	108	< 0.50	1.6	< 20	< 5.0a	-	< 100	< 0.050	36,500	< 0.50	< 0.50	< 1.0a	125	< 1.0	< 50	161,000	57	< 0.20a	17.8	< 5.0	-	-	1.1	-	< 0.050	211,000	-	-	-	< 0.20	-	-	< 50	-	31.6	< 30	< 5.0	-
	Bredin Pond-20140828	2014 08 28	9.01	673	-	13	< 0.50	1.6	74	< 5.0a	-	< 100	< 0.050	22,600	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	150,000	25	< 0.20a	15.5	< 5.0	-	-	1.5	-	< 0.050	184,000	-	-	-	< 0.20	-	-	< 50	-	25.8	< 30	< 5.0	-
	Bredin Pond-20150311	2015 03 11	-	721	-	11	< 0.50	1.3	78	< 5.0a	-	< 100	< 0.050	42,400	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	149,000	11	< 0.20a	15.7	< 5.0	-	-	1.6	-	< 0.050	191,000	-	-	-	< 0.20	-	-	< 50	-	28.3	< 30	5.3	-
	Bredin Pond-20150616	2015 06 16	-	623	-	12	< 0.50	1.3	38	< 5.0a	< 200	< 100	< 0.050	20,400	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	139,000	11	< 0.20a	15	< 5.0	< 300	11,000	1.2	7,460	< 0.050	174,000	2,620	75,600	0.41	< 0.20	< 0.10	< 30	< 50	< 24.2	< 30	33.5	-	
	Bredin Pond-20151029	2015 10 29	9.27	553	-	22	< 0.50	1.5	60	< 5.0a	< 200	< 100	< 0.050	17,100	0.7	< 0.50	< 1.0a	< 30	< 1.0	< 50	124,000	< 10	< 0.20a	17	< 5.0	< 300	10,100	1.3	9,500	< 0.050	163,000	2,570	72,900	0.35	< 0.20	< 0.10	< 30	< 50	< 23.7	< 30	15.6	< 0.30	
	BREDIN POND-20160518	2016 05 18	-	506	-	< 10	< 0.50	< 1.0	63	< 5.0a	-	< 100	< 0.050	10,400	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	117,000	< 10	< 0.20a	13.8	< 5.0	-	-	1.6	-	< 0.050	155,000	-	-	-	< 0.20	-	-	< 50	-	22	< 30	< 5.0	-
	BREDIN POND-20160914	2016 09 14	-	597	-	13	< 0.50	< 1.0	< 20	< 5.0a	< 200	< 100	< 0.050	18,300	< 0.50	< 0.50	1.1	< 30	< 1.0	< 50	134,000	< 10	< 0.20a	15	< 5.0	< 300	13,500	1.4	7,430	< 0.050	181,000	3,050	-	-	< 0.20	-	< 30	< 50	< 22.3	< 30	< 5.0	-	
	BREDIN POND-20161116	2016 11 16	8.52	611	-	14	< 0.50	1.4	46	< 5.0a	< 200	< 100	< 0.050	30,400	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	130,000	< 10	< 0.20a	14.1	< 5.0	< 300	13,600	1.2	7,020	< 0.050	180,000	2,900	-	0.39	< 0.20	-	< 30	< 50	< 20.6	< 30	< 5.0	< 0.30	
	BREDIN POND-20170418	2017 04 18	8.63	684	-	12	< 0.50	1.3	79	< 5.0a	< 200	< 100	< 0.050	46,000	0.53	< 0.50	1.7	< 30	< 1.0	< 50	138,000	19	< 0.20a	11	< 5.0	< 300	13,500	1.3	4,970	< 0.050	186,000	2,870	-	0.25	< 0.20	< 0.10	< 30	< 50	< 21.5	< 30	12.2	< 0.30	
	BREDIN POND-20170607	2017 06 07	8.72	732	-	16	< 0.50	1.6	44	< 5.0a	< 200	< 100	< 0.050	47,400	< 0.50	< 0.50	< 1.0a	< 30	< 1.0	< 50	149,000	35	< 0.20a	13.8	< 5.0	< 300	13,1																

Table 4: Historical Summary of Analytical Results For Surface Water - Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Total Metals																															
			pH	Total Hardness mg/L	pH (field)	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium µg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Phosphorus µg/L	Potassium µg/L	Selenium µg/L	Silicon µg/L	Silver µg/L	Sodium µg/L	Strontium µg/L	Sulphur µg/L	Tellurium µg/L	Thallium µg/L	Thorium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L	Zirconium µg/L	
NORTHEAST POND (Cont'd)	NORTHEAST POND-181107	2018 11 07	8.45	1,030	8.61	588	0.21	3.25	117	< 0.10	< 0.10	102	0.019	67,000	1.60	0.93	5.35	942	0.58	40.3	211,000	183	< 0.010	23.3	3.78	575	19,200	< 0.50	13,200	< 0.050	288,000	3,880	169,000	< 0.50	< 0.020	< 0.10	< 0.20	33.9	< 1.0	36.6	3.6	4.4	0.66	
	Northeast Pond	2019 03 29	8.49	724	8.72	331	< 0.20	2.59	64.8	< 0.10	< 0.10	56.9	0.024	53,900	0.90	0.62	1.54	555	0.51	27.7	143,000	180	< 0.040a	11.9	3.11	345	11,500	< 0.50	8,100	< 0.050	192,000	2,780	135,000	< 0.50	< 0.020	< 0.10	< 0.20	18.0	< 1.0	25.1	2.7	4.2	0.52	
	Northeast Pond	2019 06 05	8.60	1,010	8.33	140	0.23	3.77	93.4	< 0.10	< 0.10	102	0.026	52,700	< 0.50	0.56	1.92	194	0.21	44.9	214,000	119	< 0.040a	27.3	3.54	325	16,000	< 0.50	2,300	< 0.050	317,000	3,840	197,000	< 0.50	< 0.020	< 0.10	< 0.20	7.8	< 1.0	41.0	4.6	< 4.0	0.55	
	Northeast Pond	2019 09 04	8.98	1,040	9.62	142	0.28	4.42	84.7	< 0.10	< 0.10	34.2	< 0.010	24,300	0.92	0.37	0.72	202	< 0.20	53.6	237,000	81.1	< 0.010	30.0	2.87	149	15,800	< 0.50	2,000	< 0.050	329,000	4,120	206,000	< 0.50	< 0.020	< 0.10	< 0.20	7.8	< 1.0	40.8	2.2	< 4.0	0.23	
	NE Pond	2019 10 23	8.52	1,040	9.04	35.1	0.20	3.48	64.8	< 0.10	< 0.10	48.7	0.013	33,200	< 0.50	0.53	0.48	62	< 0.20	45.4	232,000	220	< 0.010	32.9	4.34	246	16,100	< 0.50	3,000	< 0.050	304,000	4,160	202,000	< 0.50	< 0.020	< 0.10	< 0.20	< 5.0	< 1.0	54.4	1.6	< 4.0	0.35	
	NEPOND-200407	2020 04 07	8.46	1,000	9	27.2	0.178	3.37	39.2	< 0.010	< 0.010	61.0	0.0056	53,000	0.58	0.324	0.67	55.4	0.060	44.1	211,000	176	< 0.010	22.2	2.94	350	15,900	0.38	5.480	< 0.010	298,000	3,890	198,000	< 0.050	< 0.0040	0.011	< 0.050	2.04	< 0.20	40.9	2.12	< 1.0	0.572	
	NEPOND-200605	2020 06 05	8.72	1,050	8.67	17.6	0.219	3.95	15.4	< 0.010	< 0.010	87.1	0.0069	52,600	0.14	0.245	0.32	36.8	< 0.050	40.2	223,000	132	< 0.010	18.6	2.45	343	17,600	0.28	2.760	< 0.010	328,000	4,210	211,000	< 0.050	< 0.0040	< 0.010	< 0.050	1.32	< 0.20	33.6	2.50	< 1.0	0.345	
	NEPOND-200918	2020 09 18	8.82	1,030	8.85	73.4	0.345	6.45	115	< 0.010	< 0.010	78.0	0.0061	39,400	0.36	0.545	0.66	149	0.117	34.8	226,000	318	< 0.010	18.6	3.01	555	22,100	0.33	10,400	< 0.010	322,000	3,670	176,000	< 0.050	< 0.0040	0.016	< 0.050	5.71	< 0.20	26.6	4.09	3.0	0.716	
	NEPOND-201028	2020 10 28	8.50	1,030	8.69	77.9	0.220	3.76	105	0.196	< 0.010	89.7	0.0084	40,500	0.27	0.621	10.6	151	0.157	48.2	225,000	261	< 0.010	22.0	3.28	344	17,600	0.22	10,000	< 0.010	323,000	4,230	194,000	< 0.050	< 0.0040	0.026	< 0.050	6.83	< 0.20	32.6	3.41	2.4	0.948	
	NE POND-210323	2021 03 23	8.42	963	8.5	117	0.201	2.53	60.5	< 0.010	< 0.010	92.7	0.0067	57,300	0.49	0.492	1.15	187	0.122	33.8	199,000	112	< 0.010	24.3	3.41	297	15,100	0.26	5,270	< 0.010	278,000	7,730	165,000	< 0.050	< 0.0040	0.013	0.097	6.88	< 0.20	35.8	2.90	1.7	0.782	
NE POND-210616	2021 06 16	8.89	1,080	8.83	198	0.214	3.31	55.1	< 0.010	< 0.010	65.5	0.0087	38,300	0.62	0.495	0.96	329	0.222	47.7	239,000	105	< 0.010	31.9	3.81	262	15,700	0.21	6,120	< 0.010	321,000	4,020	198,000	< 0.050	< 0.0040	0.024	< 0.050	13.2	0.26	40.1	3.12	2.3	0.382		
NE POND-211019	2021 10 19	8.60	1,220	8.70	79.9	0.187	2.65	129	< 0.010	< 0.010	48.8	0.0117	40,400	0.36	0.392	0.48	160	0.084	54.6	272,000	118	< 0.010	45.7	3.69	260	19,700	0.26	4,040	0.021	379,000	4,770	220,000	< 0.050	< 0.0040	0.010	0.055	5.75	0.25	51.0	1.10	1.4	0.840		
SLOUGH	Slough-20010619	2001 06 19	-	-	-	-	< 50a	140	430	< 50a	< 70	2,470	< 5a	2,700	< 8a	32	10	240	22	106	139,000	8	-	37	59	1,700	447,000	< 40a	1,720	< 10a	8,930,000	532	2,600,000	-	< 40a	-	< 30	5	-	< 10	< 6	-		
	Slough-20010711	2001 07 11	-	-	-	-	< 100a	< 200a	108	< 10a	< 200	3,840	< 10a	< 5,000	< 20a	65	30	400	63	210	124,000	7.5	-	60	70	1,600	725,000	< 100a	4,340	< 30a	12,700,000	535	4,040,000	-	< 100a	-	< 80	63	-	53	< 20a	-		
	Slough-20010815	2001 08 15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Slough-20010816	2001 08 16	-	-	-	-	< 200a	< 500a	95	< 30a	< 400	5,480	< 30a	< 10,000	< 40a	< 30a	< 50a	310	140	320	135,000	< 10	-	50	85	3,200	1,000,000	< 200a	4,050	< 50a	19,100,000	595	5,760,000	-	< 200a	-	< 200	70	-	< 50	< 30a	-		
	Slough-20010920	2001 09 20	-	-	-	-	< 200a	530	255	< 30a	< 400	8,110	< 30a	< 10,000	< 40a	130	< 50a	420	< 100a	310	194,000	20	-	55	220	8,600	1,570,000	< 200a	2,860	< 50a	29,700,000	845	9,400,000	-	< 200a	-	< 200	205	-	< 90	85	-		
	Alki Lake-20080506	2008 05 06	9.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Alki Lake-20080507	2008 05 07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Alki Lake-20080520	2008 05 20	9.43	1,070	-	-	-	-	-	-	-	-	-	18,000	-	-	-	-	-	-	-	249,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Slough-20090521	2009 05 21	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Alki Lake-20091119	2009 11 19	-	1,120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Slough-20130429	2013 04 29	9.51	715	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											

Table 4: Historical Summary of Analytical Results For Surface Water - Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters			Total Metals																																					
			pH	Total Hardness mg/L	pH (field)	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium µg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Phosphorus µg/L	Potassium µg/L	Selenium µg/L	Silicon µg/L	Silver µg/L	Sodium µg/L	Strontium µg/L	Sulphur µg/L	Tellurium µg/L	Thallium µg/L	Thorium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L	Zirconium µg/L
TUTT POND (Cont'd)	Tutt Pond-20140331	2014 03 31	8.56	923	-	84	< 0.50	2.7	75	< 5.0a	-	< 100	< 0.050	81,100	< 0.50	0.53	< 1.0a	119	< 1.0	< 50	175,000	157	< 0.20a	9.3	< 5.0	-	-	< 1.0	-	< 0.050	284,000	-	-	-	< 0.20	-	-	< 50	-	33.4	< 30	< 5.0	-
	Tutt Pond-20140528	2014 05 28	8.68	984	-	119	< 0.50	3.8	66	< 5.0a	-	< 100	< 0.10	85,400	< 1.0	0.61	1.4	146	< 1.0	< 50	187,000	41	< 0.20a	9.6	< 5.0	-	-	< 2.0	-	< 0.050	329,000	-	-	-	< 0.20	-	-	< 50	-	38	< 30	< 5.0	-
	Tutt Pond-20140731	2014 07 31	8.79	964	-	26	< 0.50	4.7	< 20	< 5.0a	-	< 100	< 0.10	52,300	< 1.0	< 0.50	< 1.0a	32	< 1.0	< 50	202,000	55	< 0.20a	8.6	< 5.0	-	-	< 2.0	-	< 0.050	364,000	-	-	-	< 0.20	-	-	< 50	-	29.3	< 30	< 5.0	-
	Tutt Pond-20140828	2014 08 28	8.78	967	-	372	< 0.50	5.3	39	< 5.0a	-	< 100	< 0.10	64,700	< 1.0	0.62	1.2	461	< 1.0	< 50	195,000	156	< 0.20a	8.6	< 5.0	-	-	< 2.0	-	< 0.050	337,000	-	-	-	< 0.20	-	-	< 50	-	31.1	< 30	< 5.0	-
	Tutt Pond-20140930	2014 09 30	8.54	999	-	198	< 0.50	5.6	66	< 5.0a	-	< 100	< 0.10	77,600	< 1.0	0.64	1.1	253	< 1.0	< 50	195,000	320	< 0.20a	8.8	< 5.0	-	-	< 2.0	-	< 0.050	338,000	-	-	-	< 0.20	-	-	< 50	-	31.2	< 30	5.7	-
	Tutt Pond-20150311	2015 03 11	-	822	-	65	< 0.50	2.5	71	< 5.0a	-	< 100	< 0.050	70,600	< 0.50	< 0.50	1.3	90	< 1.0	< 50	157,000	51	< 0.20a	12.1	< 5.0	-	-	< 1.0	-	< 0.050	247,000	-	-	-	< 0.20	-	-	< 50	-	30.6	< 30	< 5.0	-
	Tutt Pond-20150616	2015 06 16	-	864	-	22	< 0.50	3.2	58	< 5.0a	< 200	< 100	< 0.050	47,300	< 0.50	< 0.50	1.1	< 30	< 1.0	< 50	181,000	13	< 0.20a	11	< 5.0	< 300	13,100	< 1.0	1.610	< 0.050	286,000	4,130	188,000	0.61	< 0.20	< 0.20	< 30	< 50	-	31	< 30	< 5.0	-
	Tutt Pond-20150902	2015 09 02	8.5	1,060	-	305	< 0.50	5.9	85	< 5.0a	< 200	< 100	< 0.050	91,600	0.64	0.79	< 1.0a	383	< 1.0	< 50	202,000	279	< 0.20a	10.3	< 5.0	660	15,900	< 1.0	9.670	< 0.050	359,000	5,280	269,000	0.54	< 0.20	< 0.20	< 30	< 50	-	40.6	< 30	6.4	0.7
	Tutt Pond-20151029	2015 10 29	8.46	960	-	131	< 0.50	4.6	75	< 5.0a	< 200	< 100	< 0.050	89,300	< 0.50	0.72	< 1.0a	149	< 1.0	< 50	179,000	251	< 0.20a	13.2	< 5.0	500	12,700	< 1.0	9,270	< 0.050	302,000	4,950	239,000	0.71	< 0.20	< 0.20	< 30	< 50	-	41.8	< 30	< 5.0	0.63
	TUTT POND-20160518	2016 05 18	-	843	-	35	< 0.50	2.5	62	< 5.0a	-	< 100	< 0.050	78,600	< 0.50	< 0.50	2	44	< 1.0	< 50	157,000	20	< 0.20a	13.6	< 5.0	-	-	1	-	< 0.050	281,000	-	-	-	< 0.20	-	-	< 50	-	43.4	< 30	< 5.0	-
	TUTT POND-20160914	2016 09 14	-	960	-	117	< 0.50	3.9	72	< 5.0a	< 200	< 100	< 0.050	79,300	< 0.50	< 0.50	< 1.0a	139	< 1.0	< 50	185,000	102	< 0.20a	12.1	< 5.0	390	14,800	< 1.0	7,550	< 0.050	333,000	4,990	-	-	< 0.20	-	< 30	< 50	-	40.1	< 30	< 5.0	-
	TUTT POND-20161116	2016 11 16	8.44	820	-	199	< 0.50	3.6	63	< 5.0a	< 200	< 100	< 0.050	72,400	< 0.50	0.66	1.4	220	< 1.0	< 50	155,000	164	< 0.20a	12.6	< 5.0	410	14,000	< 1.0	8,100	< 0.050	267,000	3,990	-	< 0.40	< 0.20	-	< 30	< 50	-	36.9	< 30	< 5.0	< 0.60
	TUTT POND-20170418	2017 04 18	8.63	777	-	73	< 0.50	2	72	< 5.0a	< 200	< 100	< 0.050	76,500	< 0.50	< 0.50	1.3	87	< 1.0	< 50	142,000	55	< 0.20a	10.7	< 5.0	< 300	12,400	< 1.0	6,190	< 0.050	234,000	3,650	-	0.35	< 0.20	< 0.10	< 30	< 50	-	31.9	< 30	< 5.0	0.69
	TUTT POND-20170607	2017 06 07	8.75	860	-	26	< 0.50	2.2	80	< 5.0a	< 200	< 100	< 0.050	79,100	< 0.50	< 0.50	1.3	32	< 1.0	< 50	161,000	20	< 0.20a	11.1	< 5.0	< 300	13,300	1	470	< 0.050	265,000	3,850	-	0.59	< 0.20	< 0.10	< 30	< 50	-	32.2	< 30	< 5.0	< 0.30
	TUTT POND-20170907	2017 09 07	8.54	1,010	-	42	< 0.50	3.6	56	< 5.0a	< 200	< 100	< 0.050	90,900	< 0.50	< 0.50	1.1	50	< 1.0	< 50	190,000	70	< 0.20a	10.9	< 5.0	300	14,800	< 1.0	5,170	< 0.050	304,000	4,790	-	0.48	< 0.20	< 0.20	< 30	< 50	-	43	< 30	< 5.0	0.38
	TUTT POND-20171101	2017 11 01	8.39	1,100	-	45	< 0.50	4.1	74	< 5.0a	< 200	< 100	< 0.050	120,000	< 0.50	0.56	< 1.0a	71	< 1.0	< 50	194,000	314	< 0.20a	10.5	< 5.0	610	15,300	< 1.0	10,400	< 0.050	329,000	5,790	-	0.55	< 0.20	< 0.20	< 30	< 50	-	49.4	< 30	< 6.0	0.58
	TUTT POND-180404	2018 04 04	8.68	792	8	291	< 0.20	2.05	56.5	< 0.10	< 0.10	39.8	0.011	70,600	1.02	0.57	4.76	419	< 0.20	25.5	149,000	61.5	< 0.010	14.8	2.31	226	13,600	1.38	< 1,000	< 0.050	249,000	3,690	162,000	< 0.50	< 0.020	< 0.10	< 0.20	18.3	< 1.0	38.7	4.0	6.5	0.46
	TUTT POND-180417	2018 04 17	8.64	799	8.66	181	< 0.20	1.82	60.1	< 0.10	< 0.10	47.6	< 0.010	67,200	1.12	0.53	1.89	269	< 0.20	25.3	153,000	61.0	< 0.010	14.6	2.41	115	13,000	1.10	< 1,000	< 0.050	248,000	3,590	183,000	< 0.50	< 0.020	< 0.10	< 0.20	10.6	< 1.0	38.0	3.6	5.2	0.36
	TUTT POND-180503	2018 05 03	8.62	681	8.02	22.8	0.22	1.95	69.3	< 0.10	< 0.10	46.6	0.017	56,900	0.68	0.29	2.50	37	< 0.20	30.1	131,000	23.4	-	15.6	1.55	82	14,800	1.48	2,000	< 0.050	200,000	3,090	98,500	< 0.50	< 0.020	< 0.10	< 0.20	< 5.0	< 1.0	26.4	4.4	7.2	0.24
	TUTT POND-180523	2018 05 23	8.46	708																																							

Table 4: Historical Summary of Analytical Results For Surface Water - Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters										Total Metals																														
			pH	Total Hardness mg/L	pH (field)	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium µg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Phosphorus µg/L	Potassium µg/L	Selenium µg/L	Silicon µg/L	Silver µg/L	Sodium µg/L	Strontium µg/L	Sulphur µg/L	Tellurium µg/L	Thallium µg/L	Thorium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L	Zirconium µg/L
ROBERT LK (Cont'd)	ROBERT LAKE - SOUTH-20161117	2016 11 17	-	1,070	-	2,750	< 2.0	11	< 50	< 25a	< 1,000	< 500	< 0.10	33,100	5.3	2.2	< 10a	3,410	1.6	< 50	241,000	123	< 0.20a	90.3	< 10	3,300	90,000	< 1.0	9,480	< 0.20	4,500,000	3,630	-	-	< 0.20	-	< 150	147	-	131	< 150a	< 25	-
	ROBERT LK-180417	2018 04 17	8.98	1,040	8.92	150	0.91	9.89	31.0	< 0.10	< 0.10	22.3	0.025	55,600	1.19	0.82	2.20	198	0.20	8.81	220,000	345	< 0.010	61.1	4.42	2,750	58,600	0.59	7,000	< 0.050	2,710,000	3,190	1,780,000	< 0.50	< 0.020	< 0.10	< 0.20	10.8	1.4	89.9	6.0	< 4.0	2.31
	ROBERT LK-180503	2018 05 03	8.98	1,090	8.58	58.8	0.65	10.2	32.8	< 0.10	< 0.10	31.7	0.033	63,000	< 0.50	0.74	1.83	77	< 0.20	12.3	225,000	242	-	55.5	4.05	2,610	57,100	0.58	5,800	< 0.050	2,460,000	3,540	1,700,000	< 0.50	< 0.020	< 0.10	< 0.20	5.0	1.0	82.2	6.2	4.8	1.86
	ROBERT LK-180614	2018 06 14	8.97	1,200	9.19	47.0	0.80	11.1	33.6	< 0.10	< 0.10	29.3	0.033	79,500	< 0.50	0.39	1.06	70	< 0.20	21.0	244,000	238	< 0.010	45.2	2.85	2,390	57,500	< 0.50	3,400	< 0.050	2,020,000	4,080	1,570,000	< 0.50	< 0.020	< 0.10	< 0.20	< 5.0	< 1.0	74.3	3.1	4.3	1.19
	ROBERT LK-180712	2018 07 12	9.02	1,120	9.22	110	0.57	9.51	23.8	< 0.10	< 0.10	44.8	0.029	71,300	0.52	0.31	1.18	101	< 0.20	19.8	229,000	95.7	< 0.010	47.5	2.92	2,270	51,700	< 0.50	1,700	< 0.050	1,840,000	4,050	1,310,000	< 0.50	< 0.020	< 0.10	< 0.20	5.5	< 1.0	73.3	2.4	< 4.0	0.85
	Robert Lk	2019 03 29	9.02	685	9.25	118	0.29	5.21	25.9	< 0.10	< 0.10	17.2	0.021	36,000	< 0.50	0.50	1.56	165	0.23	10.7	144,000	206	< 0.040a	36.8	2.70	1,530	31,100	< 0.50	4,600	< 0.050	1,240,000	2,170	890,000	< 0.50	< 0.020	< 0.10	< 0.20	7.5	< 1.0	54.1	3.1	< 4.0	1.30
	Robert Lk	2019 05 06	8.92	1,060	8.6	691	0.53	7.39	42.8	< 0.10	< 0.10	32.0	0.061	59,300	1.49	0.88	2.42	777	0.59	17.0	221,000	172	< 0.040a	47.5	4.42	2,400	46,600	0.51	8,200	< 0.050	1,960,000	3,530	1,300,000	< 0.50	< 0.020	< 0.10	< 0.20	40.7	< 1.0	76.8	5.0	7.1	2.33
	Robert Lk	2019 06 05	8.85	1,130	8.62	631	0.58	8.52	51.9	< 0.10	< 0.10	49.1	0.030	68,200	1.37	0.80	1.95	731	0.53	20.9	234,000	236	< 0.040a	39.2	4.41	2,700	47,700	0.71	6,900	< 0.050	2,020,000	3,750	1,290,000	< 0.50	< 0.020	< 0.10	< 0.20	34.2	< 1.0	71.7	5.0	7.1	1.64
	Robert Lk	2019 09 04	8.91	1,490	8.61	1,040	0.76	13.8	55.8	< 0.10	< 0.10	81.9	0.027	92,800	2.51	1.15	3.00	1,230	0.81	25.5	306,000	153	< 0.010	45.2	5.87	4,280	68,500	0.85	8,500	0.072	2,630,000	5,420	1,750,000	< 0.50	< 0.020	0.15	< 0.20	61.5	1.2	90.9	8.1	6.7	2.93
	ROBERTLAKE-200407	2020 04 07	8.87	1,190	9.4	420	0.436	8.04	42.6	0.016	< 0.010	51.1	0.0189	63,900	0.98	1.02	2.84	515	0.399	19.4	250,000	192	< 0.010	53.2	4.56	3,000	48,700	0.56	8,020	< 0.010	1,740,000	3,380	1,350,000	< 0.050	< 0.0040	0.080	< 0.050	26.5	0.85	91.5	10.2	3.2	3.68
	ROBERTLAKE-200605	2020 06 05	8.81	1,220	8.86	850	0.558	8.90	56.7	0.038	0.014	43.1	0.0434	96,800	2.19	1.64	2.84	1,150	0.660	15.1	239,000	373	< 0.010	56.6	5.80	4,250	51,100	0.49	4,780	< 0.010	1,800,000	4,530	1,230,000	0.052	0.0080	0.124	0.075	71.6	1.00	94.6	10.0	5.3	4.69
	ROBERTLAKE-200928	2020 09 28	8.97	1,450	8.92	1,430	0.611	11.9	58.8	0.046	0.019	63.4	0.0379	93,200	2.70	1.23	3.38	1,330	0.864	24.0	296,000	168	< 0.010	52.9	6.02	3,770	63,200	0.79	9,630	< 0.010	2,410,000	4,650	1,740,000	0.054	0.0113	0.212	0.066	77.4	1.29	90.7	7.73	7.7	3.46
	ROBERTLAKE-201028	2020 10 28	8.94	1,380	9.18	1,790	0.621	12.1	61.6	0.077	0.021	65.9	0.0484	66,400	3.08	1.48	3.97	1,770	1.24	27.4	295,000	145	< 0.010	56.6	6.68	3,920	62,600	1.08	13,100	0.018	2,280,000	4,100	1,680,000	< 0.050	0.0165	0.228	0.071	104	1.48	90.0	11.3	9.2	3.72
	ROBERT LAKE-210412	2021 04 12	8.73	1,330	9.12	1,630	0.546	10.1	62.3	0.058	0.025	48.6	0.0478	62,200	3.28	1.85	4.79	1,950	1.33	22.6	286,000	261	< 0.010	66.3	7.22	3,620	54,100	0.61	15,100	0.012	2,070,000	3,700	1,410,000	< 0.050	0.0147	0.190	0.090	102	1.16	96.4	13.6	8.6	3.25
	ROBERT LAKE-210616	2021 06 16	8.96	1,510	9.02	1,450	0.485	9.71	69.5	0.053	0.027	64.5	0.0425	93,500	2.74	1.51	5.88	1,730	1.18	25.2	311,000	291	< 0.010	58.0	6.38	3,840	63,100	0.50	15,000	< 0.010	2,300,000	4,060	1,550,000	< 0.050	0.0149	0.184	0.053	80.5	1.08	105	7.59	7.7	3.10
	ROBERT LAKE-210922	2021 09 22	9.12	1,980	9.12	1,150	0.649	15.4	81.5	0.029	0.017	62.6	0.0383	44,500	2.47	1.29	3.63	1,210	1.20	22.6	453,000	127	< 0.010	76.2	7.53	4,120	90,200	1.25	13,500	< 0.010	3,460,000	4,990	2,270,000	< 0.050	0.0101	0.136	< 0.050	63.2	1.88	127	7.83	7.5	3.23
	ROBERT LAKE-211021	2021 10 21	9.08	1,530	9.29	1,250	< 5.00	12.7	58.5	< 1.00a	< 1.00	278	< 0.200	42,500	< 10.0a	1.13	< 10.0	1,450	< 5.00	26.9	345,000	105	< 0.010	60.1	4.95	4,110	66,200	< 10.0a	11,500	< 1.00	2,740,000	4,530	1,910,000	< 5.00	< 0.400	< 1.00	< 5.00	73.1	< 5.00	96.5	< 20.0	< 100	2.51
DIFFUSER	DIFFUSER-180417	2018 04 17	8.98	1,090	9.26	176	0.59	10.1	31.2	< 0.10	< 0.10	20.6	0.017	57,400	0.97	1.05	2.44	248	0.27	8.99	230,000	355	< 0.010	60.8	4.72	2,900	60,800	0.57	7,400	< 0.050	2,440,000	3,170	1,840,000	< 0.50	< 0.020	< 0.10	< 0.20	12.7	1.2	90.2	6.2	4.5	2.30
	DIFFUSER-180503	2018 05 03	8.98	1,110	8.67	51.5	0.67	10.5	33.2	< 0.10	< 0.10	30.0	0.033	64,700	< 0.50	0.74	1.64	69	< 0.20	12.5	230,000	250	-	56.4	4.08	2,710	58,700	0.57	5,900	< 0.050	2,540,000	3,610	1,740,000	< 0.50	< 0.020	< 0.10	< 0.20	< 5.0	< 1.0	83.9	6.4	6.5	1.90
	DIFFUSER-180615	2018 06 15	8.99	1,230	9.29	70.1	0.75	11.1	33.3	< 0.10	< 0.10	28.2	0.032	82,100	< 0.50	0.41	0.99	109	< 0.20	20.3	249,000	243	< 0.010	44.9	2.99	2,410	59,400	< 0.50	3,600	< 0.050	2,000,000	4,130	1,600,000	< 0.50	< 0.020	< 0.10	0.26	5.3	< 1.0	73.0	3.2	5.3	1.15
JH Outfall	JH OUTFALL-180417	2018 04 17	8.68	861	8.89	312	< 0.20	1.92	59.3	< 0.10	< 0.10	41.8	< 0.010	76,100	1.13	0.65	2.13	452	0.30	27.2	163,000	84.2	< 0.010	14.9	2.72	96	13,700	1.22	< 1,000	< 0.050	272,000	3,630	201,000	< 0.50	< 0.020	< 0.10	< 0.20	17.7	< 1.0	38.4	4.1	5.4	0.45
	JH OUTFALL-180503	2018 05 03	8.63	710	8.31	29.1	0.20	2.05	70.0	< 0.10	< 0.10	42.1	0.014	63,500	0.76	0.31	2.04	47	< 0.20	32.0	134,000	27.3	-	15.8	1.67	84	15,200	1.55	2,300	< 0.050	212,000	3,320	113,000	< 0.50	< 0.020	< 0.10	< 0.20</						

Table 5: Historical Summary of Analytical Results For Leachate

Sample Location		N Pumphouse MH												Sample Location		N Pumphouse MH							
Sample ID	LEACHATE-PUMPHOUSE MANHOLE-20130312	N Pumphouse MH-20080205	N Pumphouse MH-20080219	N Pumphouse MH-20080304	N Pumphouse MH-20080325	N Pumphouse MH-20080408	N Pumphouse MH-20080424	N Pumphouse MH-20080507	N Pumphouse MH-20080521	N Pumphouse MH-20080617	N Pumphouse MH-20080626	N Pumphouse MH-20080708	Sample ID	N Pumphouse MH-20131211	N Pumphouse MH-20140408	N Pumphouse MH-20140610	N Pumphouse MH-20150122	N Pumphouse MH-20150615	N Pumphouse MH-20150915	N Pumphouse MH-20151203			
Sample Date (yyyy mm dd)	2013 03 12	2008 02 05	2008 02 19	2008 03 04	2008 03 25	2008 04 08	2008 04 24	2008 05 07	2008 05 21	2008 06 17	2008 06 26	2008 07 08	Sample Date (yyyy mm dd)	2013 12 11	2014 04 08	2014 06 10	2015 01 22	2015 06 15	2015 09 15	2015 12 03			
Parameter	Units	Analytical Results												Parameter	Units	Analytical Results							
Dissolved Inorganics																							
Ammonia, Total (as N)	µg/L	118,000	-	-	-	-	-	-	-	-	-	-	Ammonia, Total (as N)	µg/L	108,000	64,800	65,300	40,600	95,000	99,700	111,000		
Nitrate (as N)	µg/L	< 250	-	-	-	-	-	-	-	-	-	-	Nitrate (as N)	µg/L	< 250	< 250	350	< 250	< 250	< 250	350		
Nitrite (as N)	µg/L	-	-	-	-	-	-	-	-	-	-	-	Nitrite (as N)	µg/L	-	-	-	-	-	-	-		
Chloride	mg/L	490	-	-	-	-	-	-	-	-	-	-	Chloride	mg/L	380	506	553	368	377	416	441		
Fluoride	µg/L	5,200	-	-	-	-	-	-	-	-	-	-	Fluoride	µg/L	2,200	< 1,000	778	< 1,000	1,600	< 1,000	< 1,000		
Sulfate	mg/L	503	-	-	-	-	-	-	-	-	-	-	Sulfate	mg/L	376	1,130	860	299	545	548	698		
Total Alkalinity	mg/L	-	-	-	-	-	-	-	-	-	-	-	Total Alkalinity	mg/L	-	3,440	4,930	2,100	3,470	3,640	3,640		
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	-	2,100	-	3,640	3,640		
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	-	< 1.0	-	< 1.0	< 1.0		
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	-	< 1.0	-	< 1.0	< 1.0		
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	Alkalinity, Phenolphthalein (as CaCO3)	mg/L	-	-	-	-	-	-	-		
Bromide	mg/L	3.3	-	-	-	-	-	-	-	-	-	-	Bromide	mg/L	2.6	4.2	4.7	< 2.5	2.6	3.3	2.9		
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	Sulfide	mg/L	-	-	-	-	-	-	-		
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	-	-	Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-		
Chemical Oxygen Demand	mg/L	454	-	-	-	-	-	-	-	-	-	-	Chemical Oxygen Demand	mg/L	381	626	660	205	357	421	415		
Phosphate	mg/L	-	-	-	-	-	-	-	-	-	-	-	Phosphate	mg/L	-	-	-	-	-	-	-		
Ortho-Phosphate	mg/L	2.5	-	-	-	-	-	-	-	-	-	-	Ortho-Phosphate	mg/L	2.2	3.07	4.55	0.8	2.3	2.46	2.63		
Total Organic Carbon	mg/L	120	-	-	-	-	-	-	-	-	-	-	Total Organic Carbon	mg/L	106	-	-	-	-	-	-		
Total Phosphorous as P	mg/L	-	-	-	-	-	-	-	-	-	-	-	Total Phosphorous as P	mg/L	-	-	-	-	-	-	-		
Dissolved Metals																							
Dissolved Aluminum	µg/L	-	-	-	-	-	-	-	-	-	-	-	Dissolved Aluminum	µg/L	-	94	82	20	36	42	46		
Dissolved Calcium	mg/L	-	-	-	-	-	-	-	-	-	-	-	Dissolved Calcium	mg/L	-	66.2	64.4	115	104	95	96.2		
Dissolved Iron	µg/L	-	-	-	-	-	-	-	-	-	-	-	Dissolved Iron	µg/L	-	261	144	1,060	116	106	76		
Dissolved Magnesium	mg/L	-	-	-	-	-	-	-	-	-	-	-	Dissolved Magnesium	mg/L	-	185	257	214	250	265	286		
Dissolved Manganese	µg/L	-	-	-	-	-	-	-	-	-	-	-	Dissolved Manganese	µg/L	-	283	299	841	423	377	395		
Dissolved Potassium	mg/L	-	-	-	-	-	-	-	-	-	-	-	Dissolved Potassium	mg/L	-	-	-	-	-	166	169		
Dissolved Sodium	mg/L	-	-	-	-	-	-	-	-	-	-	-	Dissolved Sodium	mg/L	-	1,770	2,260	686	1,140	1,370	1,520		
Antimony	µg/L	-	-	-	-	-	-	-	-	-	-	-	Antimony	µg/L	-	3.8	11.8	< 0.50	3.3	7.69	8		
Arsenic	µg/L	-	-	-	-	-	-	-	-	-	-	-	Arsenic	µg/L	-	16.5	33.9	1.7	9.6	14.1	16		
Barium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Barium	µg/L	-	100	148	201	238	247	256		
Beryllium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Beryllium	µg/L	-	< 10	< 15	< 5.0	< 10	< 10	< 10		
Boron	µg/L	-	-	-	-	-	-	-	-	-	-	-	Boron	µg/L	-	1,590	1,640	890	1,390	1,490	1,520		
Cadmium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Cadmium	µg/L	-	< 0.50	< 0.50	< 0.25	< 0.050	< 0.050	< 0.050		
Chromium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Chromium	µg/L	-	16.1	22.3	5.2	11.1	13.4	15		
Cobalt	µg/L	-	-	-	-	-	-	-	-	-	-	-	Cobalt	µg/L	-	6.6	6.1	3.27	7.03	6.92	7.7		
Copper	µg/L	-	-	-	-	-	-	-	-	-	-	-	Copper	µg/L	-	< 5.0	< 5.0	< 2.5	< 1.0	< 1.0	< 2.0		
Lead	µg/L	-	-	-	-	-	-	-	-	-	-	-	Lead	µg/L	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Lithium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Lithium	µg/L	-	< 50	59	< 50	< 50	< 50	< 50		
Mercury	µg/L	-	-	-	-	-	-	-	-	-	-	-	Mercury	µg/L	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20		
Molybdenum	µg/L	-	-	-	-	-	-	-	-	-	-	-	Molybdenum	µg/L	-	3	4.6	< 1.0	1.4	2.2	1.3		
Nickel	µg/L	-	-	-	-	-	-	-	-	-	-	-	Nickel	µg/L	-	25.8	26	8.5	14.1	16.1	17.6		
Selenium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Selenium	µg/L	-	< 10	< 10	< 5.0	< 1.0	1.7	< 1.0		
Silver	µg/L	-	-	-	-	-	-	-	-	-	-	-	Silver	µg/L	-	< 0.10	< 0.10	< 0.050	< 0.050	< 0.050	< 0.10		
Thallium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Thallium	µg/L	-	< 1.0	< 1.0	< 0.50	< 0.050	< 0.20	< 0.10		
Titanium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Titanium	µg/L	-	59	73	< 50	< 50	55	55		
Tungsten	µg/L	-	-	-	-	-	-	-	-	-	-	-	Tungsten	µg/L	-	-	-	-	-	-	-		
Uranium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Uranium	µg/L	-	22.5	16.2	3.61	5.43	5.09	4.55		
Vanadium	µg/L	-	-	-	-	-	-	-	-	-	-	-	Vanadium	µg/L	-	< 60	< 90	< 30	< 60	< 60	< 60		
Zinc	µg/L	-	-	-	-	-	-	-	-	-	-	-	Zinc	µg/L	-	< 10	< 15	< 5.0	< 10	< 10	< 10		
Bismuth	µg/L	-	-	-	-	-	-	-	-	-	-	-	Bismuth	µg/L	-	-	-	-	-	< 400	< 400		
Phosphorous	µg/L	-	-	-	-	-	-	-	-	-	-	-	Phosphorous	µg/L	-	-	-	-	-	2,640	3,180		
Silicon	µg/L	-	-	-	-	-	-	-	-	-	-	-	Silicon	µg/L	-	-	-	-	-	15,700	15,400		
Strontium	µg/L	-	-	-	-	-	-																

Table 5: Historical Summary of Analytical Results For Leachte

					Sample Location		N Pumphouse MH												Sample Location					
N PUMPHOUSE MH-20160315	N PUMPHOUSE MH-20160623	N PUMPHOUSE MH-20160915	N PUMPHOUSE MH-20161117	N PUMPHOUSE MH-20170914	Sample ID		N PUMPHOUSE MH-20171204	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH-20180524	N Pumphouse MH	N Pumphouse MH-20181108	N Pumphouse MH	N Pumphouse MH-20190315	N Pumphouse MH	N Pumphouse MH-20190603	N Pumphouse MH	N Pumphouse MH-20190903	Sample ID	N Pumphouse MH	N Pumphouse MH-20191031	N Pumphouse MH	N Pumphouse MH	
2016 03 15	2016 06 23	2016 09 15	2016 11 17	2017 09 14		Sample Date (yyyy mm dd)	2017 12 04	2018 03 15	2018 05 24	2018 05 24	2018 11 08	2018 11 08	2019 03 15	2019 03 15	2019 06 03	2019 06 03	2019 09 03	2019 09 03		2019 10 31	2019 10 31	2020 03 05	2020 06 03	
					Parameter	Units	Analytical Results												Parameter	Units				
					Dissolved Inorganics														Dissolved Inorganics					
76,800	11,400	99,000	140,000	87,000	Ammonia, Total (as N)	µg/L	65,600	171	52,900	52,900	50,200	50,200	14,600	14,600	39,500	39,500	33,800	33,800	Ammonia, Total (as N)	µg/L	52,300	52,300	55,100	35,000
< 250	5,710	< 250	< 250	< 250	Nitrate (as N)	µg/L	< 250	7,230	< 100	< 100	< 250	< 250	3,530	3,530	< 100	< 100	< 10	< 10	Nitrate (as N)	µg/L	< 100	< 100	< 10	< 100
-	-	-	-	-	Nitrite (as N)	µg/L	-	< 100	< 100	-	< 250	-	390	-	< 100	-	< 10	< 10	Nitrite (as N)	µg/L	< 100	-	< 10	< 100
420	217	502	671	503	Chloride	mg/L	554	131	437	437	936	936	501	501	410	410	89.9	89.9	Chloride	mg/L	401	401	337	530
< 1,000	1,280	< 1,000	< 1,000	1,100	Fluoride	µg/L	< 1,000	< 1,000	< 1,000	< 1,000	< 2,500	< 2,500	< 1,000	< 1,000	1,100	1,100	110	110	Fluoride	µg/L	< 1,000	< 1,000	810	< 1,000
573	347	893	996	954	Sulfate	mg/L	1,160	236	1,010	1,010	2,660	2,660	1,340	1,340	1,120	1,120	240	240	Sulfate	mg/L	1,160	1,160	859	1,350
3,190	934	3,920	4,680	3,760	Total Alkalinity	mg/L	5,390	575	2,740	2,740	6,350	6,350	2,890	2,890	3,310	3,310	6,780	6,780	Total Alkalinity	mg/L	3,440	3,440	2,900	3,310
3,190	-	-	-	-	Alkalinity, Bicarbonate	mg/L	-	575	2,740	2,740	6,350	6,350	2,790	2,790	3,310	3,310	6,780	6,780	Alkalinity, Bicarbonate	mg/L	3,440	3,440	2,900	3,310
< 1.0	-	-	-	-	Alkalinity, Carbonate	mg/L	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	102	102	< 1.0	< 1.0	< 1.0	< 1.0	Alkalinity, Carbonate	mg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 1.0	-	-	-	-	Alkalinity, Hydroxide	mg/L	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Alkalinity, Hydroxide	mg/L	< 1.0	< 1.0	< 1.0	< 1.0
-	-	-	-	-	Alkalinity, Phenoxide	mg/L	-	< 1.0	< 1.0	-	< 1.0	-	50.8	-	< 1.0	-	< 1.0	-	Alkalinity, Phenoxide	mg/L	< 1.0	-	< 1.0	< 1.0
2.8	< 1.0	3.7	5.3	3.4	Bromide	mg/L	3.9	< 1.00	< 1.00	< 1.00	< 2.50	< 2.50	2.37	2.37	< 1.00	< 1.00	< 1.00	< 1.00	Bromide	mg/L	2.60	2.6	1.88	2.59
-	-	-	-	-	Sulfide	mg/L	-	< 0.020	31.7	-	102	-	26.7	-	46.1	-	129	-	Sulfide	mg/L	75.3	-	46.3	38.4
-	-	-	-	-	Biochemical Oxygen Demand	mg/L	-	< 5.5	63.7	-	301	-	111	-	58.3	-	275	-	Biochemical Oxygen Demand	mg/L	60.2	-	79.4	113
518	46	482	681	508	Chemical Oxygen Demand	mg/L	529	< 20	382	382	925	925	436	436	430	430	947	947	Chemical Oxygen Demand	mg/L	310	310	385	549
-	-	-	-	-	Phosphate	mg/L	-	0.0860	3.02	-	6.51	-	-	-	2.90	-	-	-	Phosphate	mg/L	-	-	-	-
2.29	0.222	3.01	0.392	3.33	Ortho-Phosphate	mg/L	4.5	-	-	3.02	-	6.51	3.27	3.27	-	2.9	0.865	0.865	Ortho-Phosphate	mg/L	1.00	1	2.01	3.42
-	-	-	-	-	Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	Total Organic Carbon	mg/L	-	-	-	-
-	-	-	-	-	Total Phosphorus	mg/L	-	0.143	4.00	-	8.06	-	4.30	-	3.99	-	10.1	-	Total Phosphorus	mg/L	2.90	-	2.80	5.01
					Dissolved Metals														Dissolved Metals					
59	< 10	49	58	70	Dissolved Aluminum	µg/L	156	< 5.0	78.3	78.3	180	180	81.6	81.6	72.4	72.4	168	168	Dissolved Aluminum	µg/L	40.7	40.7	32.7	105
84.6	58.7	113	89.6	96.8	Dissolved Calcium	mg/L	66.2	69.3	83.0	83	54.6	54.6	57.9	57.9	83.1	83.1	50.6	50.6	Dissolved Calcium	mg/L	95.4	95.4	104	7.35
89	130	122	84	< 90	Dissolved Iron	µg/L	53	11	97	97	68	68	48	48	52	52	62	62	Dissolved Iron	µg/L	76.2	76.2	182	56.3
236	149	291	262	270	Dissolved Magnesium	mg/L	305	136	205	205	257	257	204	204	232	232	215	215	Dissolved Magnesium	mg/L	272	272	293	157
494	90	493	355	411	Dissolved Manganese	µg/L	317	27.9	305	305	196	196	157	157	316	316	154	154	Dissolved Manganese	µg/L	369	369	580	250
182	31.6	177	243	177	Dissolved Potassium	mg/L	253	16.7	151	151	307	307	134	134	158	158	251	251	Dissolved Potassium	mg/L	146	146	138	168
1,580	308	1,760	2,020	1,700	Dissolved Sodium	mg/L	3,250	184	1,330	1,330	4,180	4,180	1,960	1,960	1,720	1,720	4,200	4,200	Dissolved Sodium	mg/L	1,690	1,690	1,410	1,750
7.85	0.73	12.3	9.3	8.5	Antimony	µg/L	4.66	< 0.20	9.61	9.61	25.1	25.1	8.90	8.9	6.92	6.92	11.2	11.2	Antimony	µg/L	9.63	9.63	7.65	10.8
21.8	2.3	24.8	23.5	17.2	Arsenic	µg/L	15.8	1.15	25.8	25.8	89.9	89.9	20.8	20.8	19.8	19.8	34.5	34.5	Arsenic	µg/L	35.4	35.4	21.3	46.1
151	97	303	234	233	Barium	µg/L	172	78.9	205	205	142	142	85.7	85.7	159	159	156	156	Barium	µg/L	232	232	228	98.6
< 10	< 5.0	< 10	< 10	< 15	Beryllium	µg/L	< 0.50	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	Beryllium	µg/L	0.024	0.024	0.017	< 0.010
1,650	230	1,680	2,060	1,520	Boron	µg/L	1,930	28.0	1,350	1,350	1,240	1,240	978	978	1,240	1,240	2,260	2,260	Boron	µg/L	1,160	1,160	1,290	135
< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	Cadmium	µg/L	< 0.025	0.015	0.011	0.011	0.012	0.012	0.013	0.013	< 0.010	< 0.010	0.014	0.014	Cadmium	µg/L	0.0053	0.0053	0.0036	0.0088
16.1	3.14	17	22.5	12.6	Chromium	µg/L	26.5	2.63	15.7	15.7	45.7	45.7	14.3	14.3	15.3	15.3	47.6	47.						

Table 5: Historical Summary of Analytical Results For Leachate

N Pumphouse MH						P1 Leachate MH										Sample Location		P1 Leachate MH							
N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	Landfill Leachate-20061109	Landfill Leachate-20061116	Landfill Leachate-20061122		P1 LEACHATE MH-20130911	P1 LEACHATE MH-20140408	P1 LEACHATE MH-20140610	P1 LEACHATE MH-20150122	P1 LEACHATE MH-20150615	Sample ID	P1 LEACHATE MH-20150915	P1 LEACHATE MH-20151203	P1 LEACHATE MH-20160315	P1 LEACHATE MH-20160623	P1 LEACHATE MH-20160915	P1 LEACHATE MH-20161117	P1 LEACHATE MH-20170914			
2020 09 30	2020 11 16	2021 03 18	2021 06 17	2021 09 16	2021 10 22	2006 11 09	2006 11 16	2006 11 22		2013 09 11	2014 04 08	2014 06 10	2015 01 22	2015 06 15	Sample Date (yyyy mm dd)	2015 09 15	2015 12 03	2016 03 15	2016 06 23	2016 09 15	2016 11 17	2017 09 14			
Analytical Results															Parameter	Units	Analytical Results								
Dissolved Inorganics																									
101,000	29,800	37,300	56,500	70,600	32,000	-	-	-		102,000	82,000	73,700	23,900	78,300	Ammonia, Total (a	µg/L	91,500	78,200	58,300	17,300	18,400	71,100	74,300		
< 100	1,240	1,950	< 100	< 100	< 100	-	-	-		< 250	< 250	< 250	< 100	< 250	Nitrate (as N)	µg/L	< 250	< 250	< 250	4,060	170	< 250	< 250		
< 100	< 100	5,110	< 100	< 100	< 100	-	-	-		-	-	-	-	-	Nitrite (as N)	µg/L	-	-	-	-	-	-	-		
605	369	548	518	704	362	-	-	-		445	391	319	304	355	Chloride	mg/L	389	306	435	219	246	392	408		
< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	-	-	-		1,000	1,400	1,530	1,000	1,600	Fluoride	µg/L	1,200	1,200	< 1,000	1,100	1,230	1,400	< 4,000		
1,200	813	1,430	1,360	1,620	834	-	-	-		448	878	784	374	959	Sulfate	mg/L	1,170	890	753	443	404	982	933		
4,280	3,350	4,080	4,540	5,950	2,530	-	-	-		-	4,020	4,850	1,510	4,270	Total Alkalinity	mg/L	4,410	3,910	3,030	1,070	1,300	3,990	3,700		
4,280	3,340	4,080	4,540	5,660	2,530	-	-	-		-	-	-	1,510	-	Alkalinity, Bicarbon	mg/L	4,410	3,910	3,030	-	-	-	-		
< 1.0	8.7	< 1.0	< 1.0	292	< 1.0	-	-	-		-	-	-	< 1.0	-	Alkalinity, Carbona	mg/L	< 1.0	< 1.0	< 1.0	-	-	-	-		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-		-	-	-	< 1.0	-	Alkalinity, Hydroxi	mg/L	< 1.0	< 1.0	< 1.0	-	-	-	-		
< 1.0	4.3	< 1.0	< 1.0	146	< 1.0	-	-	-		-	-	-	-	-	Alkalinity, Phenolp	mg/L	-	-	-	-	-	-	-		
< 10.0	2.56	< 10.0	1.16	< 10.0	< 10.0	-	-	-		2.8	3.4	3.1	< 1.0	2.8	Bromide	mg/L	3.9	< 2.5	2.6	< 1.0	1	3.3	3.1		
73.3	82.3	70.5	51.7	89.2	11.6	-	-	-		-	-	-	-	-	Sulfide	mg/L	-	-	-	-	-	-	-		
269	334	88.0	64.0	200	34.0	-	-	-		-	-	-	-	-	Biochemical Oxyg	mg/L	-	-	-	-	-	-	-		
789	460	472	562	653	188	-	-	-		413	433	353	117	336	Chemical Oxygen	mg/L	405	288	411	71	100	319	374		
-	-	-	-	-	-	-	-	-		-	-	-	-	-	Phosphate	mg/L	-	-	-	-	-	-	-		
2.96	2.67	2.04	0.647	4.00	0.923	-	-	-		2.34	3.27	3.94	0.43	3.32	Ortho-Phosphate	mg/L	3.26	3.32	0.503	0.27	0.502	0.319	3.09		
-	-	-	-	-	-	-	-	-		114	-	-	-	-	Total Organic Car	mg/L	-	-	-	-	-	-	-		
5.27	3.73	4.39	4.53	5.39	2.12	-	-	-		-	-	-	-	-	Total Phosphorou	mg/L	-	-	-	-	-	-	-		
Dissolved Metals																									
60.7	116	70.1	160	68.1	61.3	-	-	-		-	41	22	13	29	Dissolved Aluminu	µg/L	659	32	55	< 10	< 10	16	47		
103	43.6	77.4	125	92.6	103	-	-	-		-	89.4	107	99.9	100	Dissolved Calcium	mg/L	102	97.9	124	83.2	85	94.3	106		
30.8	< 200	69.1	< 200	118	51.8	-	-	-		-	695	65	1,830	< 90	Dissolved Iron	µg/L	100	156	224	92	276	80	93		
234	135	197	209	183	302	-	-	-		-	301	389	186	304	Dissolved Magnes	mg/L	369	364	203	156	172	336	310		
490	101	211	253	313	273	-	-	-		-	442	475	636	440	Dissolved Mangan	µg/L	419	505	860	215	650	473	560		
161	132	138	222	120	129	-	-	-		-	-	-	-	-	Dissolved Potassi	mg/L	160	113	125	43.9	51.4	125	147		
1,810	1,950	1,860	2,170	1,680	1,620	-	-	-		-	1,580	1,730	541	1,520	Dissolved Sodium	mg/L	1,880	1,500	1,090	419	409	1,670	1,590		
11.1	17.3	14.0	12.8	15.8	16.0	-	-	-		-	2.43	1.35	< 0.50	1.4	Antimony	µg/L	< 0.50	1.52	2.64	0.76	< 0.50	1.9	5.2		
31.2	41.6	53.6	33.8	43.8	43.4	-	-	-		-	10.1	6.7	1.4	7	Arsenic	µg/L	1.1	6.8	12.6	2.1	2.4	4.2	12.2		
204	79.5	111	127	134	176	-	-	-		-	316	401	130	261	Barium	µg/L	304	330	145	92	108	254	251		
0.024	< 1.00	0.024	< 1.00	0.022	0.024	-	-	-		-	< 10	< 10	< 5.0	< 15	Beryllium	µg/L	< 15	< 10	< 10	< 5.0	< 5.0	< 10	< 15		
1,510	1,140	1,300	1,990	1,230	1,290	-	-	-		-	1,460	1,400	540	1,360	Boron	µg/L	1,370	1,040	1,170	360	460	1,390	1,330		
0.0038	< 0.200	0.0056	< 0.200	0.0075	0.0068	-	-	-		-	< 0.25	< 0.25	< 0.10	< 0.050	Cadmium	µg/L	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050		
21.4	18.7	16.7	17.6	19.0	17.1	-	-	-		-	12.3	10.3	2.9	11.3	Chromium	µg/L	1.33	9.24	11.1	1.73	2.02	9.5	12.5		
6.72	2.56	2.82	4.39	3.35	5.49	-	-	-		-	6.52	6.66	1.54	6.2	Cobalt	µg/L	1.31	4.68	4.62	1.5	1.98	6.6	5.6		
0.60	< 10.0	0.49	< 10.0	0.27	0.39	-	-	-		-	< 2.5	< 2.5	< 1.0	< 2.0	Copper	µg/L	6	< 1.0	< 1.0	3.5	1.4	< 2.0	< 2.0		
< 0.050	< 5.00	< 0.050	< 5.00	< 0.050	< 0.050	-	-	-		-	< 1.0	< 1.0	< 1.0	< 1.0	Lead	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
57.6	35.5	54.3	69.5	52.9	76.5	-	-	-		-	< 50	< 50	< 50	< 50	Lithium	µg/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50		
< 0.010	< 0.010	< 0.060	< 0.010	< 0.040	< 0.020	-	-	-		-	< 0.20	< 0.20	< 0.20	< 0											

Table 5: Historical Summary of Analytical Results For Leachate

P1 LEACHATE MH-20171204	P1 Leachate MH	P1 Leachate MH	P1 Leachate MH- 20180524	P1 Leachate MH	Sample Location		P1 Leachate MH		P1 Leachate MH		P1 Leachate MH 2						S Leachate Wet Well							Sample Date	
					Sample ID	P1 Leachate MH- 20180816	P1 Leachate MH	P1 Leachate MH	P1 Leachate MH- 20190315							S LEACHATE WET WELL- 20131211	S LEACHATE WET WELL- 20140408	S LEACHATE WET WELL- 20140610	S LEACHATE WET WELL- 20150615	S LEACHATE WET WELL- 20150915	S LEACHATE WET WELL- 20151203	S LEACHATE WET WELL- 20160315			
						2018 08 16	2018 11 08	2019 03 15	2019 03 15	2020 09 29	2020 11 16	2021 03 18	2021 06 18	2021 09 16	2021 10 22	2013 12 11	2014 04 08	2014 06 10	2015 06 15	2015 09 15	2015 12 03	2016 03 15			
					Parameter	Units	Analytical Results																		Parameter
					Dissolved Inorganics																				Dissolved Inorga
88,900	59,400	67,700	67,700	61,600	Ammonia, Total (a	µg/L	61,600	60,700	43,000	43,000	462,000	110,000	433,000	175,000	892,000	935,000	128,000	65,400	46,500	189,000	255,000	224,000	99,200	Ammonia, Total (a	
< 250	< 250	< 1,000	< 1,000	< 100	Nitrate (as N)	µg/L	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 500	< 250	< 250	< 500	< 500	< 500	< 250	Nitrate (as N)	
-	< 250	< 1,000	-	< 100	Nitrite (as N)	µg/L	-	< 100	< 100	-	< 100	191	543	< 100	< 100	< 100	-	-	-	-	-	-	-	Nitrite (as N)	
428	294	270	270	329	Chloride	mg/L	329	244	238	238	976	849	831	430	1,950	2,010	909	524	352	803	924	886	598	Chloride	
1,100	< 2,500	1,140	1,140	1,600	Fluoride	µg/L	1,600	1,770	1,590	1,590	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	2,200	< 1,000	668	< 2,000	< 2,000	< 2,000	< 1,000	Fluoride	
1,090	808	662	662	868	Sulfate	mg/L	868	795	661	661	326	261	< 10.0	686	< 10.0	< 10.0	1,860	1,190	533	2,370	2,310	1,620	857	Sulfate	
4,130	2,370	3,390	3,390	3,710	Total Alkalinity	mg/L	3,710	3,360	2,500	2,500	5,110	4,600	6,580	2,920	10,100	10,600	-	3,250	2,990	7,730	8,640	6,960	4,450	Total Alkalinity	
-	2,370	3,390	3,390	3,710	Alkalinity, Bicarb	mg/L	3,710	3,360	2,500	2,500	5,110	4,600	6,580	2,920	10,100	10,600	-	-	-	-	8,640	6,960	4,450	Alkalinity, Bicarb	
-	< 1.0	< 1.0	< 1.0	< 1.0	Alkalinity, Carbon	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	< 1.0	< 1.0	< 1.0	Alkalinity, Carbon	
-	< 1.0	< 1.0	< 1.0	< 1.0	Alkalinity, Hydroxi	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	< 1.0	< 1.0	< 1.0	Alkalinity, Hydroxi	
-	< 1.0	< 1.0	-	< 1.0	Alkalinity, Phenol	mg/L	-	< 1.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	Alkalinity, Phenol	
3.1	< 0.10	< 10.0	< 10.0	< 10.0	Bromide	mg/L	< 10.0	< 10.0	1.39	1.39	< 1.00	32.2	23.0	1.85	< 10.0	< 10.0	9.1	4.6	3	7.1	8.3	6.9	4.7	Bromide	
-	28.9	29.5	-	36.5	Sulfide	mg/L	-	26.2	18.9	-	< 2.00	3.38	5.13	13.8	2.78	0.632	-	-	-	-	-	-	-	Sulfide	
-	49.8	40.8	-	42.5	Biochemical Oxyg	mg/L	-	36.1	38.7	-	8.120	2,770	1,550	< 354	2,130	1,280	-	-	-	-	-	-	-	Biochemical Oxyg	
444	294	212	212	243	Chemical Oxygen	mg/L	243	223	184	184	13,600	3,910	3,840	1,180	4,560	3,990	1,090	676	398	982	1,130	996	705	Chemical Oxygen	
-	2.05	1.48	-	2.22	Phosphate	mg/L	-	0.975	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Phosphate	
3.76	-	-	1.48	-	Ortho-Phosphate	mg/L	2.22	-	1.10	1.1	8.27	10.8	11.0	< 0.0500	3.95	2.91	7.66	3.37	3.05	6.68	8.29	7.03	3.71	Ortho-Phosphate	
-	-	-	-	-	Total Organic Car	mg/L	-	-	-	-	-	-	-	-	-	-	273	-	-	-	-	-	-	Total Organic Car	
-	2.53	2.44	-	3.38	Total Phosphoru	mg/L	-	2.36	2.15	-	29.1	20.6	17.3	3.36	15.2	18.9	-	-	-	-	-	-	-	Total Phosphoru	
					Dissolved Metals																				Dissolved Metals
49.7	40.3	31.9	31.9	24.7	Dissolved Aluminu	µg/L	24.7	22.9	14.6	14.6	67.4	101	169	24.1	191	149	-	96	103	82	77	66	62	Dissolved Aluminu	
95	109	122	122	106	Dissolved Calcium	mg/L	106	107	104	104	1,030	691	942	278	548	466	-	60.6	64.2	94.8	78.8	73.5	79.6	Dissolved Calcium	
53	74	90	90	105	Dissolved Iron	µg/L	105	69	87	87	14,400	1,210	7,460	1,690	37,300	20,400	-	198	< 120	< 150	< 300	< 150	70	Dissolved Iron	
344	200	378	378	326	Dissolved Magnes	mg/L	326	342	363	363	239	278	375	256	413	457	-	178	294	319	374	344	250	Dissolved Magnes	
455	562	705	705	717	Dissolved Mangan	µg/L	717	593	661	661	14,300	8,140	13,500	2,920	7,660	7,450	-	251	335	320	297	308	460	Dissolved Mangan	
175	157	117	117	105	Dissolved Potassi	mg/L	105	104	91.1	91.1	566	588	487	208	985	964	-	-	-	-	426	364	224	Dissolved Potassi	
1,960	1,440	1,230	1,230	1,270	Dissolved Sodium	mg/L	1,270	1,210	1,080	1,080	1,190	972	896	834	1,770	1,810	-	1,850	3,100	3,590	4,490	3,530	1,820	Dissolved Sodium	
2.53	4.88	2.25	2.25	2.57	Antimony	µg/L	2.57	2.08	0.53	0.53	17.2	10.9	13.1	4.30	20.3	23.1	-	3.9	15.5	19	27.4	16.1	7.8	Antimony	
8.25	15.2	7.41	7.41	11.4	Arsenic	µg/L	11.4	7.73	2.72	2.72	36.9	30.9	27.2	5.77	33.5	54.8	-	17.7	46.7	60.9	75.3	46.9	21.7	Arsenic	
258	128	382	382	344	Barium	µg/L	344	288	268	268	80.1	72.7	366	138	316	219	-	80	166	247	270	224	125	Barium	
< 0.50	< 0.10	< 0.10	< 0.10	< 0.10	Beryllium	µg/L	< 0.10	< 0.10	< 0.10	< 0.10	0.010	< 1.00	0.025	0.015	0.052	0.059	-	< 10	< 20	< 25	< 50	< 25	< 10	Beryllium	
1,610	1,270	1,090	1,090	1,090	Boron	µg/L	1,090	1,110	1,280	1,280	4,720	3,210	7,480	2,880	11,600	12,100	-	1,650	2,170	2,670	3,300	3,050	1,980	Boron	
< 0.025	< 0.010	< 0.010	< 0.010	< 0.010	Cadmium	µg/L	< 0.010	< 0.010	< 0.010	< 0.010	0.0254	< 0.200	0.0582	0.0119	0.0614	0.0318	-	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.050	Cadmium	
14.9	10.3	9.73	9.73	11.0	Chromium	µg/L	11	8.15	5.07	5.07	95.7	104	108	29.9											

Table 5: Historical Summary of Analytical Results For Leachate

Sample Location													Sample Location													
Sample ID	S Leachate Wet Well												Sample ID	S Leachate Wet Well												
	S LEACHATE WET WELL-20160623	S LEACHATE WET WELL-20160915	S LEACHATE WET WELL-20161117	S LEACHATE WET WELL-20170914	S LEACHATE WET WELL-20171204	S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well-20180524	S Leachate Wet Well	S Leachate Wet Well-20180816	S Leachate Wet Well	S Leachate Wet Well-20181108		S Leachate Wet Well	S Leachate Wet Well-20190315	S Leachate Wet Well	S Leachate Wet Well-20190603	S Leachate Wet Well	S Leachate Wet Well-20190903	S Leachate Wet Well	S Leachate Wet Well-20191031	S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well		
ite (yyyy mm dd)	2016 06 23	2016 09 15	2016 11 17	2017 09 14	2017 12 04	2018 03 15	2018 05 24	2018 05 24	2018 08 16	2018 08 16	2018 11 08	2018 11 08	Sample Date (yyyy mm dd)	2019 03 15	2019 03 15	2019 06 03	2019 06 03	2019 09 03	2019 09 03	2019 10 31	2019 10 31	2020 03 05	2020 06 03	2020 09 29		
Units	Analytical Results												Parameter	Units	Analytical Results											
nics	Dissolved Inorganics													Dissolved Inorganics												
	µg/L	119,000	192,000	142,000	90,800	71,800	71,600	54,500	54,500	56,200	56,200	48,800	48,800	Ammonia, Total (a	µg/L	17,800	17,800	28,600	28,600	25,900	25,900	59,500	59,500	25,000	28,600	103,000
	< 250	< 500	< 100	< 500	< 500	< 250	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Nitrate (as N)	µg/L	< 100	< 100	< 1,000	< 1,000	< 1,000	< 1,000	< 100	< 100	< 10	< 100	< 100
	-	-	-	-	-	< 250	< 100	-	< 100	-	< 100	-	< 100	Nitrite (as N)	µg/L	< 100	-	< 100	-	< 1,000	-	< 100	-	< 10	< 100	< 100
	mg/L	613	890	168	888	903	815	523	523	871	871	980	980	Chloride	mg/L	698	698	587	587	949	949	908	908	487	540	673
	µg/L	< 1,000	< 2,000	< 400	< 10,000	< 2,000	< 2,500	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	Fluoride	µg/L	< 1,000	< 1,000	< 1,000	< 1,000	< 10,000	< 10,000	< 1,000	< 1,000	490	< 1,000	< 1,000
	mg/L	1,380	2,920	252	1,950	2,040	2,080	1,440	1,440	2,240	2,240	2,990	2,990	Sulfate	mg/L	1,950	1,950	1,570	1,570	2,500	2,500	2,370	2,370	1,200	1,350	1,260
	mg/L	4,030	9,780	24,600	5,680	6,440	5,380	3,890	3,890	5,470	5,470	6,690	6,690	Total Alkalinity	mg/L	3,870	3,870	3,390	3,390	7,300	7,300	7,670	7,670	2,570	2,630	4,400
	mg/L	-	-	-	-	-	5,380	3,890	3,890	5,470	5,470	6,690	6,690	Alkalinity, Bicarbon	mg/L	3,650	3,650	3,260	3,260	7,300	7,300	7,190	7,190	2,550	2,610	4,400
	mg/L	-	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Alkalinity, Carbon	mg/L	222	222	123	123	< 1.0	< 1.0	484	484	17.4	22.7	< 1.0
	mg/L	-	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Alkalinity, Hydroxi	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	mg/L	-	-	-	-	-	< 1.0	< 1.0	-	< 1.0	-	< 1.0	-	Alkalinity, Phenol	mg/L	111	-	61.6	-	< 1.0	-	242	-	8.7	11.4	< 1.0
	mg/L	4.5	8.1	1.3	7.5	7	< 2.50	< 1.00	< 1.00	< 10.0	< 10.0	< 10.0	< 10.0	Bromide	mg/L	3.16	3.16	< 10.0	< 10.0	< 10.0	< 10.0	< 1.00	< 1.00	2.57	2.73	1.77
	mg/L	-	-	-	-	-	87.9	63.0	-	93.8	-	85.4	-	Sulfide	mg/L	46.5	-	60.9	-	139	-	178	-	63.9	49.1	95.7
	mg/L	-	-	-	-	-	201	174	-	227	-	329	-	Biochemical Oxyg	mg/L	195	-	114	-	323	-	354	-	111	174	-
mg/L	686	1,110	967	1,110	1,020	784	711	711	826	826	988	988	Chemical Oxygen	mg/L	646	646	617	617	935	935	865	865	512	585	890	
mg/L	-	-	-	-	-	6.91	6.35	-	6.24	-	6.58	-	Phosphate	mg/L	-	-	2.66	-	-	-	-	-	-	-	-	
mg/L	3.98	9.72	22	7.43	8.23	-	-	6.35	-	6.24	-	6.58	Ortho-Phosphate	mg/L	5.40	5.4	-	2.66	8.72	8.72	1.91	1.91	3.59	3.67	3.93	
mg/L	-	-	-	-	-	-	-	-	-	-	-	-	Total Organic Car	mg/L	-	-	-	-	-	-	-	-	-	-	-	
mg/L	-	-	-	-	-	7.35	7.43	-	9.07	-	8.24	-	Total Phosphorou	mg/L	6.08	-	5.94	-	9.99	-	9.99	-	3.84	5.24	6.36	
	Dissolved Metals													Dissolved Metals												
	µg/L	91	99	100	199	170	172	154	154	187	187	177	177	Dissolved Aluminu	µg/L	124	124	129	129	186	186	149	149	66.7	91.7	107
	mg/L	142	68.3	88.1	73.4	57.8	101	63.1	63.1	70.9	70.9	47.5	47.5	Dissolved Calcium	mg/L	54.5	54.5	59.0	59	43.2	43.2	61.4	61.4	38.6	< 0.04	79
	µg/L	< 90	< 300	< 120	< 150	< 100	89	59	59	69	69	56	56	Dissolved Iron	µg/L	46	46	64	64	70	70	87.4	87.4	32.4	38.2	40.9
	mg/L	276	413	313	302	312	344	187	187	228	228	248	248	Dissolved Magnes	mg/L	220	220	174	174	202	202	217	217	143	134	190
	µg/L	538	207	364	433	300	581	451	451	273	273	180	180	Dissolved Mangan	µg/L	215	215	228	228	133	133	192	192	174	211	344
	mg/L	270	370	402	307	285	280	223	223	276	276	313	313	Dissolved Potassi	mg/L	195	195	203	203	255	255	289	289	141	158	245
	mg/L	2,250	5,330	2,970	3,560	3,680	3,530	2,100	2,100	3,130	3,130	4,450	4,450	Dissolved Sodium	mg/L	2,770	2,770	2,300	2,300	4,380	4,380	4,120	4,120	1,700	1,820	2,770
	µg/L	10	34.7	12.4	18	8	25.9	14.8	14.8	26.8	26.8	26.5	26.5	Antimony	µg/L	11.6	11.6	6.14	6.14	13.7	13.7	33.9	33.9	6.82	8.65	15.1
	µg/L	29.7	83.9	35.9	45.2	32.7	73.5	42.1	42.1	87.4	87.4	91.3	91.3	Arsenic	µg/L	33.0	33	28.3	28.3	40.1	40.1	134	134	26.2	35.8	51.7
	µg/L	181	250	212	193	152	196	132	132	179	179	133	133	Barium	µg/L	85.6	85.6	89.2	89.2	145	145	177	177	56.7	77.7	157
	µg/L	< 15	< 50	< 20	< 25	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	Beryllium	µg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.057	0.057	0.020	< 0.010	0.035
	µg/L	2,210	2,900	3,120	2,490	2,250	2,790	1,610	1,610	2,090	2,090	1,860	1,860	Boron	µg/L	1,390	1,390	1,470	1,470	2,140	2,140	1,740	1,740	1,160	< 2.0	2,070
	µg/L	< 0.050	< 0.10	< 0.050	< 0.050	< 0.050	0.014	0.011	0																	

Table 5: Historical Summary of Analytical Results For Leachate

					Sample Location		P2 A2 Leachate MH			
S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well	Sample ID		P2 A2 Leachate MH	P2 A2 Leachate MH	P2 A2 Leachate MH	P2 A2 Leachate MH
2020 11 16	2021 03 18	2021 06 17	2021 09 15	2021 10 22	Sample Date (yyyy mm dd)		2021 03 19	2021 06 18	2021 09 16	2021 10 21
					Parameter	Units	Analytical Results			
					Dissolved Inorganics					
66,400	35,500	50,300	59,900	71,800	Ammonia, Total (as N)	µg/L	81,400	127,000	161,000	155,000
< 100	3,260	16,600	21,400	< 100	Nitrate (as N)	µg/L	< 100	221	< 100	388
< 100	961	7,970	20,000	10,300	Nitrite (as N)	µg/L	< 100	< 100	< 1,000	< 100
834	620	595	788	792	Chloride	mg/L	1,030	830	1,150	1,310
< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	Fluoride	µg/L	< 1,000	< 1,000	< 1,000	< 1,000
1,900	1,540	1,410	1,730	1,710	Sulfate	mg/L	345	305	115	145
5,940	4,230	4,680	6,670	7,290	Total Alkalinity	mg/L	2,940	3,390	4,450	4,470
5,680	3,910	4,380	5,770	6,070	Alkalinity, Bicarbonate	mg/L	2,940	3,390	4,450	4,470
263	321	306	893	1,220	Alkalinity, Carbonate	mg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Alkalinity, Hydroxide	mg/L	< 1.0	< 1.0	< 1.0	< 1.0
131	161	153	446	612	Alkalinity, Phenols	mg/L	< 1.0	< 1.0	< 1.0	< 1.0
5.60	< 10.0	1.31	< 1.00	< 10.0	Bromide	mg/L	13.6	73.4	70.5	< 10.0
250	114	71.1	85.5	219	Sulfide	mg/L	0.114	1.80	3.41	2.49
469	178	123	351	605	Biochemical Oxygen Demand	mg/L	1,270	3,260	3,160	< 34268.8
859	564	642	856	794	Chemical Oxygen Demand	mg/L	1,870	6,460	4,690	644
-	-	-	-	-	Phosphate	mg/L	-	-	-	-
6.14	2.19	1.25	5.13	5.19	Ortho-Phosphate	mg/L	< 0.0500	< 0.0500	< 0.0500	< 0.0500
-	-	-	-	-	Total Organic Carbon	mg/L	-	-	-	-
7.84	5.03	6.07	6.66	7.70	Total Phosphorus	mg/L	3.19	5.79	4.42	1.66
					Dissolved Metals					
196	114	160	298	125	Dissolved Aluminum	µg/L	42.8	56.8	34.6	153
60.3	56.6	141	120	129	Dissolved Calcium	mg/L	280	675	525	163
< 200	36.4	< 200	< 200	29.3	Dissolved Iron	µg/L	6,890	37,900	85,300	9,530
229	195	235	262	249	Dissolved Magnesium	mg/L	401	322	421	410
200	137	382	206	204	Dissolved Manganese	µg/L	4,990	20,800	21,900	671
271	208	222	283	221	Dissolved Potassium	mg/L	228	186	205	222
4,000	2,810	2,100	4,070	4,370	Dissolved Sodium	mg/L	1,270	922	1,070	1,380
37.3	14.2	13.4	39.2	32.9	Antimony	µg/L	4.20	9.73	4.10	< 5.00
81.4	79.4	32.7	95.5	95.0	Arsenic	µg/L	20.7	16.8	55.8	64.1
145	90.8	153	175	156	Barium	µg/L	380	924	1,240	1,830
< 1.00	0.031	1.72	< 1.00	0.053	Beryllium	µg/L	0.017	0.013	0.016	< 1.00
2,340	1,660	1,930	2,420	2,040	Boron	µg/L	5,170	7,330	6,100	4,710
< 0.200	0.0046	< 0.200	< 0.200	0.0082	Cadmium	µg/L	0.116	0.0198	0.0253	< 0.200
41.7	24.7	18.1	46.7	42.1	Chromium	µg/L	25.9	51.0	23.5	15.0
5.11	3.14	5.23	6.37	6.88	Cobalt	µg/L	61.9	157	31.8	15.8
< 10.0	0.42	27.1	< 10.0	0.66	Copper	µg/L	3.66	0.64	1.13	< 10.0
< 5.00	0.092	< 5.00	< 5.00	0.087	Lead	µg/L	0.370	< 0.050	0.130	< 5.00
65.9	64.6	68.1	74.6	92.8	Lithium	µg/L	39.9	65.0	37.7	29.3
< 0.010	< 0.040	< 0.010	< 0.040	< 0.020	Mercury	µg/L	< 0.040	< 0.010	< 0.040	< 0.020
5.62	4.27	3.78	5.92	4.09	Molybdenum	µg/L	60.7	4.43	6.49	8.25
31.0	17.6	23.0	25.3	27.1	Nickel	µg/L	305	356	149	183
12.2	1.07	< 10.0	< 10.0	1.12	Selenium	µg/L	3.97	2.32	2.12	< 10.0
< 1.00	< 0.010	< 1.00	< 1.00	< 0.010	Silver	µg/L	0.012	< 0.010	0.012	< 1.00
< 0.400	< 0.0040	< 0.400	< 0.400	< 0.0040	Thallium	µg/L	< 0.0040	< 0.0040	< 0.0040	< 0.400
99.8	52.3	38.0	75.2	67.3	Titanium	µg/L	19.1	5.49	22.8	30.3
< 20.0	2.54	< 20.0	< 20.0	4.65	Tungsten	µg/L	2.23	0.96	2.88	< 20.0
17.8	15.7	18.3	12.0	8.94	Uranium	µg/L	12.6	3.07	2.73	3.58
< 20.0	13.9	< 20.0	< 20.0	17.1	Vanadium	µg/L	19.3	7.39	36.0	39.7
< 100	1.1	< 100	< 100	1.2	Zinc	µg/L	15.7	15.1	13.2	< 100
< 1.00	0.013	< 1.00	< 1.00	< 0.010	Bismuth	µg/L	< 0.010	< 0.010	< 0.010	< 1.00
8,240	7,230	5,280	9,840	8,790	Phosphorous	µg/L	791	655	2,550	1,600
13,700	12,100	< 5,000	14,100	15,200	Silicon	µg/L	28,600	51,600	38,400	36,000
2,420	2,130	3,030	2,950	3,320	Strontium	µg/L	7,100	6,710	7,670	7,600
882,000	882,000	555,000	792,000	1,010,000	Sulphur	µg/L	140,000	121,000	49,600	58,000
< 5.00	< 0.050	13.7	< 5.00	0.169	Tellurium	µg/L	0.258	0.265	0.271	< 5.00
< 1.00	0.024	< 1.00	< 1.00	0.020	Thorium	µg/L	0.018	< 0.010	0.018	< 1.00
93.6	34.6	17.5	127	90.1	Tin	µg/L	1.99	1.41	2.00	< 5.00
30.9	20.3	17.6	37.4	43.9	Zirconium	µg/L	81.8	5.82	77.5	95.3
					Monocyclic Aromatic Hydrocarbons					
7.9	6.3	8.0	9.5	7.4	Benzene	µg/L	0.8	1.2	3.1	0.7
103	55.3	55.0	114	97.3	Ethylbenzene	µg/L	< 1.0	3.1	9.1	2.1
2.4	1.9	1.5	2.1	1.1	Toluene	µg/L	17.4	64.6	61.5	6.3
77.8	51.4	44.0	80.2	66.7	Xylenes	µg/L	5.5	11.4	20.3	2.8
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Styrene	µg/L	2.3	3.5	2.3	< 1.0
					Polycyclic Aromatic Hydrocarbons					
5.43	3.06	2.47	6.43	3.57	Naphthalene	µg/L	< 0.200	0.525	< 2.09	< 1.97
0.808	0.549	0.596	1.19	< 1.09	Methylnaphthalene	µg/L	< 0.100	< 0.100	< 1.05	< 0.983
0.471	0.247	< 0.498	0.439	< 1.09	Methylnaphthalene	µg/L	< 0.100	0.109	< 1.05	< 0.983
< 0.200	< 0.200	< 0.995	< 0.200	< 2.18	Acenaphthylene	µg/L	< 0.200	< 0.200	< 2.09	< 1.97
0.354	0.229	0.265	0.503	< 0.545	Acenaphthene	µg/L	< 0.050	< 0.050	< 0.524	< 0.491
0.229	0.179	< 0.249	0.324	< 0.545	Fluorene	µg/L	< 0.050	< 0.050	< 0.524	< 0.491
0.340	0.266	< 0.498	0.422	< 1.09	Phenanthrene	µg/L	< 0.100	< 0.100	< 1.05	< 0.983
0.037	0.019	< 0.050	0.026	< 0.109	Anthracene	µg/L	< 0.010	< 0.038	< 0.105	< 0.098
< 0.050	< 0.050	< 0.249	< 0.050	< 0.545	Acridine	µg/L	< 0.050	0.539	< 0.524	< 0.491
0.110	0.077	< 0.149	0.111	< 0.327	Fluoranthene	µg/L	< 0.030	< 0.030	< 0.314	< 0.295
0.091	0.071	< 0.100	0.079	< 0.218	Pyrene	µg/L	< 0.020	0.045	< 0.209	< 0.197
0.021	< 0.010	< 0.050	< 0.010	< 0.109	Benz(a)anthracene	µg/L	< 0.010	< 0.039	< 0.105	< 0.098
< 0.050	< 0.050	< 0.249	< 0.050	< 0.545	Chrysene	µg/L	< 0.050	0.057	< 0.524	< 0.491
-	-	-	-	-	Benzo(b)fluoranthene	µg/L	-	-	-	-
0.057	< 0.050	< 0.249	< 0.050	< 0.545	Benzo(b+j)fluoranthene	µg/L	< 0.050	< 0.150	< 0.524	< 0.491
< 0.050	< 0.050	< 0.249	< 0.050	< 0.545	Benzo(k)fluoranthene	µg/L	< 0.050	0.076	< 0.524	< 0.491
< 0.010	< 0.010	< 0.050	< 0.010	< 0.109	Benzo(a)pyrene	µg/L	< 0.010	0.064	< 0.105	< 0.098
< 0.050	< 0.050	< 0.249	< 0.050	< 0.545	Indeno(1,2,3-cd)pyrene	µg/L	< 0.050	0.102	< 0.524	< 0.491
< 0.010	< 0.010	< 0.050	< 0.010	< 0.109	Dibenz(a,h)anthracene	µg/L	< 0.010	0.095	< 0.105	< 0.098
< 0.050	< 0.050	< 0.249	< 0.050	< 0.545	Benzo(g,h,i)perylene	µg/L	< 0.050	0.116	< 0.524	< 0.491
< 0.100	< 0.100	< 0.498	< 0.100	< 1.09	Chloronaphthalene	µg/L	< 0.100	< 0.100	< 1.05	< 0.983
< 0.050	< 0.050	< 0.249	< 0.050	< 0.545	Quinoline	µg/L	< 0.264	< 0.778	1.19	< 0.491
					Volatile Organic Compounds					
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Bromodichloromethane	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Bromoform	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	Carbon Tetrachloride	µg/L	< 0.5	< 0.5	< 0.5	< 0.5
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Chlorobenzene	µg/L	< 1.0	< 1.0	< 1.0	< 1.0

Table 5: Historical Summary of Analytical Results For Leachate

Sample Location		N Pumphouse MH												Sample Location		N Pumphouse MH						
Sample ID	LEACHATE-PUMPHOUSE MANHOLE-20130312	N Pumphouse MH-20080205	N Pumphouse MH-20080219	N Pumphouse MH-20080304	N Pumphouse MH-20080325	N Pumphouse MH-20080408	N Pumphouse MH-20080424	N Pumphouse MH-20080507	N Pumphouse MH-20080521	N Pumphouse MH-20080617	N Pumphouse MH-20080626	N Pumphouse MH-20080708	Sample ID	N Pumphouse MH-20131211	N Pumphouse MH-20140408	N Pumphouse MH-20140610	N Pumphouse MH-20150122	N Pumphouse MH-20150615	N Pumphouse MH-20150915	N Pumphouse MH-20151203		
Sample Date (yyyy mm dd)	2013 03 12	2008 02 05	2008 02 19	2008 03 04	2008 03 25	2008 04 08	2008 04 24	2008 05 07	2008 05 21	2008 06 17	2008 06 26	2008 07 08	Sample Date (yyyy mm dd)	2013 12 11	2014 04 08	2014 06 10	2015 01 22	2015 06 15	2015 09 15	2015 12 03		
Parameter	Units	Analytical Results												Parameter	Units	Analytical Results						
Volatile Organic Compounds Cont.														Volatile Organic Compounds								
Chloroethane	µg/L	9.7	20	10	30	20	10	< 10	20	20	20	10	Chloroethane	µg/L	6.3	1.3	-	-	6	6	4.3	
Chloroform	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Chloroform	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Chloromethane	µg/L	< 5.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	Chloromethane	µg/L	< 5.0	< 5.0	-	-	< 5.0	< 5.0	< 5.0	
Dibromochloromethane [DBCM]	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dibromochloromethane [DBCM]	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Dibromoethane, 1,2-	µg/L	-	-	-	-	-	-	-	-	-	-	-	Dibromoethane, 1,2-	µg/L	-	-	-	-	-	-	-	
Dibromomethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	Dibromomethane	µg/L	-	-	-	-	-	-	-	
Dichlorobenzene, 1,2-	µg/L	< 0.70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dichlorobenzene, 1,2-	µg/L	< 0.70	< 0.70	-	-	< 0.70	< 0.70	< 0.70	
	µg/L	< 1.0	1	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1	< 1	Dichlorobenzene, 1,3-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Dichlorobenzene, 1,4-	µg/L	1.1	< 1	1	1	1	1	1	< 1	1	1	1	Dichlorobenzene, 1,4-	µg/L	1.5	< 1.0	-	-	1.1	1.2	1.1	
Dichloroethane, 1,1-	µg/L	17.6	13	12	13	12	11	11	15	15	19	21	Dichloroethane, 1,1-	µg/L	16.2	1.5	-	-	12.4	9.4	6.4	
Dichloroethane, 1,2-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dichloroethane, 1,2-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Dichloroethylene, 1,1-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dichloroethylene, 1,1-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Dichloroethylene, 1,2-cis-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dichloroethylene, 1,2-cis-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Dichloroethylene, 1,2-trans-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dichloroethylene, 1,2-trans-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Dichloromethane	µg/L	< 5.0	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	Dichloromethane	µg/L	< 5.0	< 5.0	-	-	< 5.0	< 5.0	< 5.0	
Dichloropropane, 1,2-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dichloropropane, 1,2-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Dichloropropene, 1,3- (cis+trans)	µg/L	< 1.4	-	-	-	-	-	-	-	-	-	-	Dichloropropene, 1,3- (cis+trans)	µg/L	< 1.4	< 1.4	-	-	< 1.4	< 1.4	< 1.4	
Dichloropropene, 1,3-cis-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dichloropropene, 1,3-cis-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Dichloropropene, 1,3-trans-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Dichloropropene, 1,3-trans-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Tetrachloroethane, 1,1,1,2-	µg/L	< 1.0	-	-	-	-	-	-	-	-	-	-	Tetrachloroethane, 1,1,1,2-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Tetrachloroethane, 1,1,2,2-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Tetrachloroethane, 1,1,2,2-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Tetrachloroethylene	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Tetrachloroethylene	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Trichloroethane, 1,1,1-	µg/L	< 1.0	8	5	5	6	5	5	6	3	9	3	Trichloroethane, 1,1,1-	µg/L	1.6	< 1.0	-	-	1.6	1.1	< 1.0	
Trichloroethane, 1,1,2-	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Trichloroethane, 1,1,2-	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Trichloroethylene	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Trichloroethylene	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Trichlorofluoromethane	µg/L	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	Trichlorofluoromethane	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Vinyl Chloride	µg/L	< 1.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	Vinyl Chloride	µg/L	< 1.0	< 1.0	-	-	< 1.0	< 1.0	< 1.0	
Gross Parameters														Gross Parameters								
VH (C6-C10)	µg/L	-	-	-	-	-	-	-	-	-	-	-	VH (C6-C10)	µg/L	-	< 100	< 100	-	< 100	< 100	< 100	
VPH (C6-C10)	µg/L	-	-	-	-	-	-	-	-	-	-	-	VPH (C6-C10)	µg/L	-	< 100	< 100	-	< 100	< 100	< 100	
EPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-	-	-	-	EPH (C10-C19)	µg/L	-	1,110	1,180	650	< 250	260	310	
LEPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-	-	-	-	LEPH (C10-C19)	µg/L	-	1,110	1,170	650	< 250	250	310	
EPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-	-	-	-	EPH (C19-C32)	µg/L	-	640	850	720	< 250	< 250	< 250	
HEPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-	-	-	-	HEPH (C19-C32)	µg/L	-	640	850	720	< 250	< 250	< 250	
MTBE														MTBE								
Methyl Tert-butyl Ether [MTBE]	µg/L	-	-	-	-	-	-	-	-	-	-	-	Methyl Tert-butyl Ether [MTBE]	µg/L	-	-	-	-	-	-	-	
Resin and Fatty Acids														Resin and Fatty Acids								
Acetic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Acetic Acid	mg/L	-	-	-	-	-	-	-	
Butyric Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Butyric Acid	mg/L	-	-	-	-	-	-	-	
Caporic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Caporic Acid	mg/L	-	-	-	-	-	-	-	
Heptanoic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Heptanoic Acid	mg/L	-	-	-	-	-	-	-	
Isobutyric Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Isobutyric Acid	mg/L	-	-	-	-	-	-	-	
Isocaproic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Isocaproic Acid	mg/L	-	-	-	-	-	-	-	
Isovaleric Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Isovaleric Acid	mg/L	-	-	-	-	-	-	-	
Propionic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Propionic Acid	mg/L	-	-	-	-	-	-	-	
Valeric Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	Valeric Acid	mg/L	-	-	-	-	-	-	-	

Associated CARO file(s): 8031228, 8052345, 8081555, 8110837, 9031248, 9060275, 9090105, mg/l, N000833, ug/L.

Associated Exova file(s): 506479, 507801, 509233, 600276, 602695, 605393, 608922, 611891, 614770, 617175, 619914, 625680, 627511, 629501.

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

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

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

RDL Denotes reported detection limit.

Table 5: Historical Summary of Analytical Results For Leachate

					Sample Location		N Pumphouse MH													Sample Location					
N PUMPHOUSE MH-20160315	N PUMPHOUSE MH-20160623	N PUMPHOUSE MH-20160915	N PUMPHOUSE MH-20161117	N PUMPHOUSE MH-20170914	Sample ID	N PUMPHOUSE MH-20171204	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH-20180524	N Pumphouse MH	N Pumphouse MH-20181108	N Pumphouse MH	N Pumphouse MH-20190315	N Pumphouse MH	N Pumphouse MH-20190603	N Pumphouse MH	N Pumphouse MH-20190903	Sample ID	N Pumphous e MH	N Pumphous e MH- 20191031	N Pumphous e MH	N Pumphouse MH			
2016 03 15	2016 06 23	2016 09 15	2016 11 17	2017 09 14		2017 12 04	2018 03 15	2018 05 24	2018 05 24	2018 11 08	2018 11 08	2019 03 15	2019 03 15	2019 06 03	2019 06 03	2019 09 03	2019 09 03		2019 10 31	2019 10 31	2020 03 05	2020 06 03			
					Parameter	Units	Analytical Results													Parameter	Units				
					Volatile Organic Compounds															Volatile Organic Compounds					
5.2	-	-	3.7	9	Chloroethane	µg/L	< 3.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.0	2	< 2.0	< 2.0	Chloroethane	µg/L	< 2.2	< 2.2	< 2.0	< 2.0		
< 1.0	-	-	< 1.0	< 1.0	Chloroform	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Chloroform	µg/L	< 1.0	< 1.0	< 1.0	< 1.0		
< 5.0	-	-	< 5.0	< 5.0	Chloromethane	µg/L	< 5.0	-	-	-	-	-	-	-	-	-	-	Chloromethane	µg/L	-	-	-	-		
< 1.0	-	-	< 1.0	< 1.0	Dibromochlorome	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dibromochlorome	µg/L	< 1.0	< 1.0	< 1.0	< 1.0		
-	-	-	-	-	Dibromoethane, 1	µg/L	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	-	< 0.3	-	< 0.3	Dibromoethane, 1	µg/L	< 0.3	-	< 0.3	< 0.3		
-	-	-	-	-	Dibromomethane	µg/L	-	< 1.0	< 1.0	-	< 1.0	-	< 1.0	-	< 1.0	-	< 1.0	Dibromomethane	µg/L	< 1.0	-	< 1.0	< 1.0		
< 0.70	-	-	< 0.70	< 0.50	Dichlorobenzene,	µg/L	< 0.50	< 0.5	< 0.5	< 0.5	0.6	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	Dichlorobenzene,	µg/L	< 0.5	< 0.5	< 0.5	< 0.5		
< 1.0	-	-	< 1.0	< 1.0	Dichlorobenzene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.1	2.1	< 1.0	< 1.0	Dichlorobenzene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	
< 1.0	-	-	1.1	1.3	Dichlorobenzene,	µg/L	1.6	< 1.0	< 2.3	< 2.3	3.0	3	< 1.0	< 1.0	2.1	2.1	3.0	3	Dichlorobenzene,	µg/L	1.6	1.6	< 1.0	2.0	
12.6	-	-	13.3	10.1	Dichloroethane, 1	µg/L	3.2	< 1.0	1.8	1.8	10.8	10.8	2.6	2.6	3.6	3.6	9.0	9	Dichloroethane, 1	µg/L	5.8	5.8	4.3	2.9	
< 1.0	-	-	< 1.0	< 1.0	Dichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0		
< 1.0	-	-	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0		
< 1.0	-	-	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0		
< 1.0	-	-	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0		
< 5.0	-	-	< 5.0	< 5.0	Dichloromethane	µg/L	< 5.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	Dichloromethane	µg/L	< 3.0	< 3.0	< 3.0	< 3.0		
< 1.0	-	-	< 1.0	< 1.0	Dichloropropane,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloropropane,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0		
< 1.4	-	-	< 1.4	< 1.0	Dichloropropene,	µg/L	< 1.0	< 1.0	< 1.0	-	< 1.0	-	< 1.0	-	< 1.0	-	< 1.0	-	Dichloropropene,	µg/L	< 1.0	-	< 1.0	< 1.0	
< 1.0	-	-	< 1.0	< 0.50	Dichloropropene,	µg/L	< 0.50	-	-	-	-	-	-	-	-	-	-	-	Dichloropropene,	µg/L	-	-	-	-	
< 1.0	-	-	< 1.0	< 0.50	Dichloropropene,	µg/L	< 0.50	-	-	-	-	-	-	-	-	-	-	-	Dichloropropene,	µg/L	-	-	-	-	
< 1.0	-	-	< 1.0	< 1.0	Tetrachloroethane	µg/L	< 1.0	-	-	-	-	-	-	-	-	-	-	-	Tetrachloroethane	µg/L	-	-	-	-	
< 1.0	-	-	< 1.0	< 0.20	Tetrachloroethane	µg/L	< 0.20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	Tetrachloroethane	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	
< 1.0	-	-	< 1.0	< 1.0	Tetrachloroethylet	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Tetrachloroethylet	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	
< 1.0	-	-	< 1.0	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	
< 1.0	-	-	< 1.0	< 0.50	Trichloroethane, 1	µg/L	< 0.50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	
< 1.0	-	-	< 1.0	< 1.0	Trichloroethylene	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethylene	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	
< 1.0	-	-	< 1.0	< 1.0	Trichlorofluoromet	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichlorofluoromet	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	
< 1.0	-	-	< 1.0	< 0.40	Vinyl Chloride	µg/L	< 0.40	< 1.0	< 1.0	< 1.0	1.0	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Vinyl Chloride	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	
					Gross Parameters															Gross Parameters					
< 100	-	-	< 100	-	VH (C6-C10)	µg/L	-	< 100	147	147	181	181	< 100	< 100	< 100	< 100	224	224	VH (C6-C10)	µg/L	< 100	< 100	104	< 100	
< 100	-	-	< 100	-	VPH (C6-C10)	µg/L	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	VPH (C6-C10)	µg/L	< 100	< 100	< 100	< 100	
260	< 250	< 250	400	< 250	EPH (C10-C19)	µg/L	250	< 250	766	766	346	346	681	681	724	724	953	953	EPH (C10-C19)	µg/L	330	330	< 250	< 250	
260	< 250	< 250	400	< 250	LEPH (C10-C19)	µg/L	250	< 250	763	763	342	342	675	675	719	719	945	945	LEPH (C10-C19)	µg/L	325	-	< 250	< 250	
< 250	< 250	< 250	< 250	< 250	EPH (C19-C32)	µg/L	< 250	< 250	660	660	< 250	< 250	429	429	474	474	858	858	EPH (C19-C32)	µg/L	< 250	< 250	< 250	426	
< 250	< 250	< 250	< 250	< 250	HEPH (C19-C32)	µg/L	< 250	< 250	660	660	< 250	< 250	429	429	474	474	858	858	HEPH (C19-C32)	µg/L	< 250	-	< 250	426	
					MTBE															MTBE					
-	-	-	-	-	Methyl Tert-butyl f	µg/L	-	< 1.0	< 1.0	-	< 1.0	-	< 1.0	-	< 1.0	-	< 1.0	-	Methyl Tert-butyl f	µg/L	< 1.0	-	< 1.0	< 1.0	
					Resin and Fatty Acids															Resin and Fatty Acids					
-	-	-	-	-	Acetic Acid	mg/L	-	-	-	-	-	< 3.0	-	< 3.0	-	3.0	-	Acetic Acid	mg/L	< 3.0	-	23.4	< 3.0		
-	-	-	-	-	Butyric Acid	mg/L	-	-	-	-	-	< 2.0	-	< 2.0	-	< 2.0	-	Butyric Acid	mg/L	< 2.0	-	7.2	< 2.0		
-	-	-	-	-	Caporic Acid	mg/L	-	-	-	-	-	< 2.0	-	2.4	-	< 2.0	-	Caporic Acid	mg/L	< 2.0	-	3.5	< 2.0		
-	-	-	-	-	Heptanoic Acid	mg/L	-	-	-	-	-	< 2.0	-	< 2.0	-	< 2.0	-	Heptanoic Acid	mg/L	< 2.0	-	< 2.0	< 2.0		
-	-	-	-	-	Isobutyric Acid	mg/L	-	-	-	-	-	< 2.0	-	< 2.0	-	< 2.0	-	Isobutyric Acid	mg/L	< 2.0	-	< 2.0	< 2.0		
-	-	-	-	-	Isocaproic Acid	mg/L	-	-	-	-	-	< 2.0	-	< 2.0	-	< 2.0	-	Isocaproic Acid	mg/L	< 2.0	-	< 2.0	< 2.0		
-	-	-	-	-	Isovaleric Acid	mg/L	-	-	-	-	-	< 2.0	-	< 2.0	-	< 2.0	-	Isovaleric Acid	mg/L	< 2.0	-	< 2.0	< 2.0		
-	-	-	-	-	Propionic Acid	mg/L	-	-	-	-	-	< 2.0	-	< 2.0	-	< 2.0	-	Propionic Acid	mg/L	< 2.0	-	3.8	< 2.0		
-	-	-	-	-	Valeric Acid	mg/L	-	-	-	-	-	< 2.0	-	< 2.0	-	< 2.0	-	Valeric Acid	mg/L	< 2.0	-	2.0	< 2.0		

Associated CARO file(s): 8031228, 8052345, 8081555, 8110837, 9031248, 9060275, 9090105, mg/l, N000833, ug/L.

Associated Exova file(s): 506479, 507801, 509233, 600276, 602695, 605393, 608922, 611891, 614770, 617175, 619914, 625680, 627511, 629501.

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

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

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

RDL Denotes reported detection limit.

Table 5: Historical Summary of Analytical Results For Leachate

N Pumphouse MH						P1 Leachate MH										Sample Location		P1 Leachate MH							
N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	N Pumphouse MH	Landfill Leachate-20061109	Landfill Leachate-20061116	Landfill Leachate-20061122		P1 LEACHATE MH-20130911	P1 LEACHATE MH-20140408	P1 LEACHATE MH-20140610	P1 LEACHATE MH-20150122	P1 LEACHATE MH-20150615	Sample ID	P1 LEACHATE MH-20150915	P1 LEACHATE MH-20151203	P1 LEACHATE MH-20160315	P1 LEACHATE MH-20160623	P1 LEACHATE MH-20160915	P1 LEACHATE MH-20161117	P1 LEACHATE MH-20170914			
2020 09 30	2020 11 16	2021 03 18	2021 06 17	2021 09 16	2021 10 22	2006 11 09	2006 11 16	2006 11 22		2013 09 11	2014 04 08	2014 06 10	2015 01 22	2015 06 15	Sample Date (yyyy mm dd)	2015 09 15	2015 12 03	2016 03 15	2016 06 23	2016 09 15	2016 11 17	2017 09 14			
Analytical Results															Parameter	Units	Analytical Results								
															Volatile Organic Compounds										
< 3.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 10	< 10	< 10		8.1	< 1.0	-	-	< 1.0	Chloroethane	µg/L	1.2	< 1.0	4	-	-	< 1.0	6		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Chloroform	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
-	-	-	-	-	-	< 10	< 10	< 10		< 5.0	< 5.0	-	-	< 5.0	Chloromethane	µg/L	< 5.0	< 5.0	< 5.0	-	-	< 5.0	< 5.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dibromochlorome	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	-	-	-		-	-	-	-	-	Dibromoethane, 1	µg/L	-	-	-	-	-	-	-		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-		-	-	-	-	-	Dibromomethane	µg/L	-	-	-	-	-	-	-		
< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 1	< 1	< 1		< 0.70	< 0.70	-	-	< 0.70	Dichlorobenzene,	µg/L	< 0.70	< 0.70	< 0.70	-	-	< 0.70	< 0.50		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dichlorobenzene,	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
1.8	1.7	2.6	2.5	2.8	< 1.0	< 1	< 1	< 1		1.2	1.1	-	-	< 1.0	Dichlorobenzene,	µg/L	1.1	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
4.5	2.9	3.4	4.7	5.3	2.0	1	1	1		20.3	1.8	-	-	4.5	Dichloroethane, 1	µg/L	2.7	1.3	16.6	-	-	3.5	6.4		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 5	< 5	< 5		< 5.0	< 5.0	-	-	< 5.0	Dichloromethane	µg/L	< 5.0	< 5.0	< 5.0	-	-	< 5.0	< 5.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dichloropropane,	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-		< 1.4	< 1.4	-	-	< 1.4	Dichloropropene,	µg/L	< 1.4	< 1.4	< 1.4	-	-	< 1.4	< 1.0		
-	-	-	-	-	-	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dichloropropene,	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 0.50		
-	-	-	-	-	-	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Dichloropropene,	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 0.50		
-	-	-	-	-	-	-	-	-		< 1.0	< 1.0	-	-	< 1.0	Tetrachloroethane	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Tetrachloroethane	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 0.20		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Tetrachloroethyle	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 0.50		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Trichloroethylene	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1		< 1.0	< 1.0	-	-	< 1.0	Trichlorofluoromet	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0		
< 1.0	< 1.0	< 1.0	1.0	< 1.2	< 1.0	< 2	< 2	< 2		< 1.0	< 1.0	-	-	< 1.0	Vinyl Chloride	µg/L	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 0.40		
															Gross Parameters										
< 100	< 100	173	168	199	< 100	-	-	-		-	< 100	< 100	-	< 100	VH (C6-C10)	µg/L	< 100	< 100	< 100	-	-	< 100	-		
< 100	< 100	< 100	< 100	< 100	< 100	-	-	-		-	< 100	< 100	-	< 100	VPH (C6-C10)	µg/L	< 100	< 100	< 100	-	-	< 100	-		
442	< 250	355	792	< 2,500	321	-	-	-		-	920	920	400	< 250	EPH (C10-C19)	µg/L	280	< 250	< 250	< 250	< 250	270	< 250		
437	< 250	352	789	< 2,500	319	-	-	-		-	920	920	400	< 250	LEPH (C10-C19)	µg/L	280	< 250	< 250	< 250	< 250	270	< 250		
292	< 250	1,180	2,400	< 2,500	< 250	-	-	-		-	450	590	430	< 250	EPH (C19-C32)	µg/L	< 250	< 250	< 250	< 250	< 250	< 250	< 250		
292	< 250	1,180	2,400	< 2,500	< 250	-	-	-		-	450	590	430	< 250	HEPH (C19-C32)	µg/L	< 250	< 250	< 250	< 250	< 250	< 250	< 250		
															MTBE										
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-		-	-	-	-	-	Methyl Tert-butyl f	µg/L	-	-	-	-	-	-	-		
															Resin and Fatty Acids										
25.7	5.9					-	-	-		-	-	-	-	-	Acetic Acid	mg/L	-	-	-	-	-	-	-		
13.7	< 2.0					-	-	-		-	-	-	-	-	Butyric Acid	mg/L	-	-	-	-	-	-	-		
5.6	< 2.0					-	-	-		-	-	-	-	-	Caporic Acid	mg/L	-	-	-	-	-	-	-		
< 2.0	< 2.0					-	-	-		-	-	-	-	-	Heptanoic Acid	mg/L	-	-	-	-	-	-	-		
7.0	< 2.0					-	-	-		-	-	-	-	-	Isobutyric Acid	mg/L	-	-	-	-	-	-	-		
2.7	< 2.0					-	-	-		-	-	-	-	-	Isocaproic Acid	mg/L	-	-	-	-	-	-	-		
< 2.0	< 2.0					-	-	-		-	-	-	-	-	Isovaleric Acid	mg/L	-	-	-	-	-	-	-		
3.3	< 2.0					-	-	-		-	-	-	-	-	Propionic Acid	mg/L	-	-	-	-	-	-	-		
5.0	< 2.0					-	-	-		-	-	-	-	-	Valeric Acid	mg/L	-	-	-	-	-	-	-		

Associated CARO file(s): 8031228, 8052345, 8081555, 8110837, 9031248, 9060275, 9090105, mg/l, N000833, ug/L.

Associated Exova file(s): 506479, 507801, 509233, 600276, 602695, 605393, 608922, 611891, 614770, 617175, 619914, 625680, 627511, 629501.

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

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

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

RDL Denotes reported detection limit.

Table 5: Historical Summary of Analytical Results For Leachate

					Sample Location		P1 Leachate MH		P1 Leachate MH		P1 Leachate MH 2						S Leachate Wet Well							Sample Date		
P1 LEACHATE MH-20171204	P1 Leachate MH	P1 Leachate MH	P1 Leachate MH-20180524	P1 Leachate MH	Sample ID	P1 Leachate MH-20180816	P1 Leachate MH	P1 Leachate MH	P1 Leachate MH-20190315							S LEACHATE WET WELL-20131211	S LEACHATE WET WELL-20140408	S LEACHATE WET WELL-20140610	S LEACHATE WET WELL-20150615	S LEACHATE WET WELL-20150915	S LEACHATE WET WELL-20151203	S LEACHATE WET WELL-20160315				
2017 12 04	2018 03 15	2018 05 24	2018 05 24	2018 08 16		Sample Date (yyyy mm dd)	2018 08 16	2018 11 08	2019 03 15	2019 03 15	2020 09 29	2020 11 16	2021 03 18	2021 06 18	2021 09 16	2021 10 22	2013 12 11	2014 04 08	2014 06 10	2015 06 15	2015 09 15	2015 12 03	2016 03 15			
					Parameter	Units	Analytical Results																		Parameter	
					Volatile Organic Compounds																				Volatile Organic	
6.9	8.9	< 2.0	< 2.0	< 2.0	Chloroethane	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 8.0	9.9	17.4	4.7	< 6.8	< 3.0	< 2.0	< 1.0	-	1.4	1.1	< 1.0	< 1.0	Chloroethane		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Chloroform	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Chloroform		
< 5.0	-	-	-	-	Chloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	< 10	< 5.0	-	< 5.0	< 5.0	< 5.0	< 5.0	Chloromethane		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dibromochlorome	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Dibromochlorome		
-	< 0.3	< 0.3	-	< 0.3	Dibromoethane, 1	µg/L	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	-	-	-	-	-	-	-	Dibromoethane, 1		
-	< 1.0	< 1.0	-	< 1.0	Dibromomethane	µg/L	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	Dibromomethane		
< 0.50	< 0.5	< 0.5	< 0.5	< 0.5	Dichlorobenzene,	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.4	< 0.70	-	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	Dichlorobenzene,		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichlorobenzene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Dichlorobenzene,		
1.1	< 1.0	< 1.0	< 1.0	< 1.0	Dichlorobenzene,	µg/L	< 1.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.9	< 1.0	-	2	2.2	1.3	1.1	Dichlorobenzene,		
3.2	2.3	< 1.0	< 1.0	1.0	Dichloroethane, 1	µg/L	1	< 1.0	< 1.0	< 1.0	< 1.0	6.8	5.0	5.4	1.2	3.7	1.5	5.2	< 1.0	-	< 1.0	< 1.0	< 1.0	1.1	Dichloroethane, 1	
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	60.9	65.2	53.6	19.5	69.4	21.8	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethane, 1	
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	5.0	8.3	12.8	1.4	9.0	3.3	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	15.2	19.0	14.6	4.0	11.1	14.3	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	
< 5.0	< 3.0	< 3.0	< 3.0	< 3.0	Dichloromethane	µg/L	< 3.0	< 3.0	< 3.0	< 3.0	264	234	174	54.1	12.4	< 3.0	< 1.0	< 5.0	-	< 5.0	< 5.0	< 5.0	< 5.0	Dichloromethane		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloropropane,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 2.5	1.8	< 1.6	< 1.0	1.7	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Dichloropropane,		
< 1.0	< 1.0	< 1.0	-	< 1.0	Dichloropropene,	µg/L	-	< 1.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.8	< 1.4	-	< 1.4	< 1.4	< 1.4	< 1.4	Dichloropropene,		
< 0.50	-	-	-	-	Dichloropropene,	µg/L	-	-	-	-	-	-	-	-	-	-	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Dichloropropene,		
< 0.50	-	-	-	-	Dichloropropene,	µg/L	-	-	-	-	-	-	-	-	-	-	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Dichloropropene,		
< 1.0	-	-	-	-	Tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Tetrachloroethane		
< 0.20	< 0.5	< 0.5	< 0.5	< 0.5	Tetrachloroethane	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Tetrachloroethane		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Tetrachloroethylene	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 3.3	1.8	1.0	1.1	< 1.0	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Tetrachloroethylene		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethane, 1		
< 0.50	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethane, 1		
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethylene	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 2.4	2.7	7.0	< 1.0	3.9	1.8	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethylene	
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichlorofluoromet	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.1	< 1.0	< 1.0	1.4	< 1.0	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Trichlorofluoromet		
< 0.40	< 1.0	< 1.0	< 1.0	< 1.0	Vinyl Chloride	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 4.1	< 1.0	< 10.0	6.8	< 2.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	Vinyl Chloride		
					Gross Parameters																				Gross Parameter	
-	< 100	< 100	< 100	< 100	VH (C6-C10)	µg/L	< 100	< 100	< 100	< 100	1,430	889	1,570	287	1,240	481	-	< 100	120	130	140	< 100	< 100	< 100	VH (C6-C10)	
-	< 100	< 100	< 100	< 100	VPH (C6-C10)	µg/L	< 100	< 100	< 100	< 100	1,050	425	1,100	194	918	270	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	VPH (C6-C10)	
< 250	714	616	616	< 250	EPH (C10-C19)	µg/L	< 250	< 250	< 250	< 250	615	1,250	1,600	384	7,600	3,930	-	1,230	1,960	770	260	640	380	380	EPH (C10-C19)	
< 250	712	615	615	< 250	LEPH (C10-C19)	µg/L	< 250	< 250	< 250	< 250	614	1,250	1,600	384	7,600	3,930	-	1,230	1,950	750	250	620	370	370	LEPH (C10-C19)	
< 250	609	480	480	< 250	EPH (C19-C32)	µg/L	< 250	< 250	< 250	< 250	405	352	430	< 250	13,800	259	-	710	1,340	< 250	< 250	< 250	< 250	< 250	EPH (C19-C32)	
< 250	609	480	480	< 250	HEPH (C19-C32)	µg/L	< 250	< 250	< 250	< 250	405	352	430	< 250	13,800	259	-	710	1,340	< 250	< 250	< 250	< 250	< 250	HEPH (C19-C32)	
					MTBE																				MTBE	
-	< 1.0	< 1.0	-	< 1.0	Methyl Tert-butyl E	µg/L	-	< 1.0	< 1.0	-	< 1.3	7.2	9.6	1.9	< 8.6	< 4.2	-	-	-	-	-	-	-	-	Methyl Tert-butyl E	
					Resin and Fatty Acids																				Resin and Fatty	
-	-	-	-	-	Acetic Acid	mg/L	-	-	< 3.0	-	3,610	848					-	-	-	-	-	-	-	-	Acetic Acid	
-	-	-	-	-	Butyric Acid	mg/L	-	-	< 2.0	-	1,730	169					-	-	-	-	-	-	-	-	Butyric Acid	
-	-	-	-	-	Caporic Acid	mg/L	-	-	< 2.0	-	771	86.7					-	-	-	-	-	-	-	-	Caporic Acid	
-	-	-	-	-	Heptanoic Acid	mg/L	-	-	< 2.0	-	124	11.6					-	-	-	-	-	-	-	-	Heptanoic Acid	
-	-	-	-	-	Isobutyric Acid	mg/L	-	-	< 2.0	-	2,540	102					-	-	-	-	-	-	-	-	Isobutyric Acid	
-	-	-	-	-	Isocaproic Acid	mg/L	-	-	< 2.0	-	19.0	6.6					-	-	-	-	-	-	-	-	Isocaproic Acid	
-	-	-	-	-	Isovaleric Acid	mg/L	-	-	< 2.0	-	359	53.6					-	-	-	-	-	-	-	-	Isovaleric Acid	
-	-	-	-	-	Propionic Acid	mg/L	-	-	< 2.0	-	445	466					-	-	-	-	-	-	-	-	Propionic Acid	
-	-	-	-	-	Valeric Acid	mg/L	-	-	< 2.0	-	870	89.9					-	-	-	-	-	-	-	-	Valeric Acid	

Associated CARO file(s): 8031228, 8052345, 8081555, 8110837, 9031248, 9060275, 9090105, mg/l, N000833, ug/L.

Associated Exova file(s): 506479, 507801, 509233, 600276, 602695, 605393, 608922, 611891, 614770, 617175, 619914, 625680, 627511, 629501.

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

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

<

Table 5: Historical Summary of Analytical Results For Leachate

					Sample Location Sample ID	P2 A2 Leachate MH				
S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well	S Leachate Wet Well		P2 A2 Leachate MH	P2 A2 Leachate MH	P2 A2 Leachate MH	P2 A2 Leachate MH	
2020 11 16	2021 03 18	2021 06 17	2021 09 15	2021 10 22						
					Sample Date (yyyy mm dd)	2021 03 19	2021 06 18	2021 09 16	2021 10 21	
					Parameter	Units	Analytical Results			
					Volatile Organic Compounds					
< 2.0	< 2.0	< 2.0	2.0	< 2.0	Chloroethane	µg/L	< 2.0	< 2.0	< 5.2	< 2.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Chloroform	µg/L	< 1.0	1.2	< 1.0	< 1.0
-	-	-	-	-	Chloromethane	µg/L	-	-	-	-
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dibromochlorome	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	Dibromoethane, 1	µg/L	< 0.3	< 0.3	< 0.3	< 0.3
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dibromomethane	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
0.5	< 0.5	< 0.5	< 0.5	< 0.5	Dichlorobenzene,	µg/L	< 0.5	< 0.5	< 0.5	< 0.5
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichlorobenzene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
3.6	3.4	3.1	2.8	2.7	Dichlorobenzene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
5.8	3.6	5.6	6.0	4.3	Dichloroethane, 1	µg/L	< 1.0	< 1.0	2.2	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethane, 1	µg/L	2.0	7.6	10.6	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	< 1.0	2.0	6.7	5.7
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloroethylene,	µg/L	1.8	2.0	2.8	< 1.0
< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	Dichloromethane	µg/L	38.3	58.1	32.4	< 3.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloropropane,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Dichloropropene,	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
-	-	-	-	-	Dichloropropene,	µg/L	-	-	-	-
-	-	-	-	-	Dichloropropene,	µg/L	-	-	-	-
-	-	-	-	-	Tetrachloroethane	µg/L	-	-	-	-
< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	Tetrachloroethane	µg/L	< 0.5	< 0.5	< 0.5	< 0.5
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Tetrachloroethyle	µg/L	2.3	2.2	1.7	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethane, 1	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichloroethylene	µg/L	< 1.0	< 1.0	1.6	< 1.0
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Trichlorofluoromet	µg/L	< 1.0	< 1.0	< 1.0	< 1.0
< 1.3	< 1.0	< 1.0	3.2	< 1.0	Vinyl Chloride	µg/L	< 1.0	< 1.0	< 2.8	1.9
					Gross Parameters					
215	235	179	114	< 100	VH (C6-C10)	µg/L	284	496	439	< 100
< 100	120	< 100	< 100	< 100	VPH (C6-C10)	µg/L	258	413	343	< 100
424	< 250	483	544	< 2,500	EPH (C10-C19)	µg/L	299	1,150	< 2,500	< 2,500
417	< 250	480	536	< 2,500	LEPH (C10-C19)	µg/L	299	1,140	< 2,500	< 2,500
322	< 250	685	313	< 2,500	EPH (C19-C32)	µg/L	< 250	859	< 2,500	< 2,500
322	< 250	685	313	< 2,500	HEPH (C19-C32)	µg/L	< 250	859	< 2,500	< 2,500
					MTBE					
< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	Methyl Tert-butyl f	µg/L	4.0	3.5	< 9.0	< 5.0
					Resin and Fatty Acids					
5.2	-	-	-	-	Acetic Acid	mg/L	-	-	-	-
< 2.0	-	-	-	-	Butyric Acid	mg/L	-	-	-	-
< 2.0	-	-	-	-	Caporic Acid	mg/L	-	-	-	-
< 2.0	-	-	-	-	Heptanoic Acid	mg/L	-	-	-	-
< 2.0	-	-	-	-	Isobutyric Acid	mg/L	-	-	-	-
< 2.0	-	-	-	-	Isocaproic Acid	mg/L	-	-	-	-
< 2.0	-	-	-	-	Isovaleric Acid	mg/L	-	-	-	-
< 2.0	-	-	-	-	Propionic Acid	mg/L	-	-	-	-
< 2.0	-	-	-	-	Valeric Acid	mg/L	-	-	-	-

Associated CARO file(s): 8031228, 8052345, 8081555, 8110837, 9031248, 9060275, 9090105, mg/l, N000833, ug/L.

Associated Exova file(s): 506479, 507801, 509233, 600276, 602695, 605393, 608922, 611891, 614770, 617175, 619914, 625680, 627511, 629501.

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

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

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

RDL Denotes reported detection limit.

APPENDIX C

MOE OPERATION CERTIFICATE 12218



MINISTRY OF
ENVIRONMENT

OPERATIONAL CERTIFICATE

12218

Under the Provisions of the Environmental Management Act

CITY OF KELOWNA

**City Hall
1435 Water Street
Kelowna BC V1Y 1J4**

is authorized to manage waste and recyclable material from the Regional District of Central Okanagan and environs including the Big White area, at the Glenmore Landfill located 9 kilometres north-east of the Kelowna city centre, British Columbia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution. This Operational Certificate is issued pursuant to the provisions of Section 28 of the *Environmental Management Act*. This Operational Certificate supersedes all previous versions of Operational Certificate 12218 issued under the authority of the *Waste Management Act* and the *Environmental Management Act*.

“Director” means the Director or a person delegated to act on behalf of the Director, as defined in the *Environmental Management Act*.

1. AUTHORIZED DISCHARGES

1.1 This section applies to the discharge of refuse from municipal, commercial and light industrial sources to a sanitary landfill known as the Glenmore Landfill. The site reference number for this discharge is E104956.

1.1.1 The maximum authorized rate of waste discharge is 170,000 tonnes annually. The maximum quantity of waste discharged must not exceed the design capacity of the landfill as specified in an approved Design and Operations Plan. The final footprint and profile of the discharged waste must be within that specified in the Design and Operations Plan and approximately as shown on the attached locations map.

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1.1.2 The characteristics of the waste discharged to the landfill are those of municipal solid waste as defined in the *Environmental Management Act* and other waste as may be authorized by the Director.

1.1.3 The following types of wastes must not be discharged:

- (1) Hazardous wastes, other than those specifically approved for disposal to authorized landfills, as defined in the Hazardous Waste Regulation under the *Environmental Management Act*.
- (2) Anatomical, pathological, and untreated biomedical wastes as defined in the *Guidelines for the Management of Biomedical Wastes in Canada* (Canadian Council of Ministers of the Environment, February 1992). With exception of the limited biomedical wastes described within the City of Kelowna Solid Waste Management Regulation Bylaw.
- (3) Bulk liquids and semi-solid wastes, which contain free liquids, as determined by US EPA Method 9095A Paint Filter Liquids Test, Test Methods for Evaluating Solid Wastes-Physical/Chemical Methods (EPA Publication No. Sw-846).
- (4) Hog fuel, log yard debris and chipped wood waste. The reuse of these materials for temporary roads, dust control or a component of alternative daily cover is permitted.
- (5) Recyclable materials, including automobiles, white goods, other large metallic objects and tires, as directed by the Director.
- (6) Dead animals and slaughter house, fish hatchery and farming wastes or cannery wastes and by-products with the exception of slaughter waste from small (less than 200 bird) independent backyard chicken farms. Limited biomedical and carcass wastes described within the City of Kelowna Solid Waste Management Regulation Bylaw will also be accepted.

Burial of these wastes in dedicated locations (i.e. avoiding co-disposal) at the landfill site may be authorized by the Director only if there is no other viable alternative such as treatment/disposal, recycling, reprocessing or composting.

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The viability of alternatives is to be determined by the Director based on submission of cost data by the holder of the Operational Certificate. For those cases in which the dedicated disposal of otherwise prohibited wastes is authorized, the specific on-site location of the disposal must be recorded to allow ready access to the waste should corrective or further action pertaining to the management of these wastes be required by the Ministry at some time in the future.

- 1.1.4** Notwithstanding the requirements of section 1.1.3(1) the disposal of waste asbestos in compliance with the requirements of Section 40 of the Hazardous Waste Regulation under the *Environmental Management Act* is hereby authorized.
- 1.1.5** Notwithstanding the requirements of section 1.1.3(1), the deposit of hydrocarbon contaminated soils below the Hazardous Waste Regulation criteria is authorized at this landfill subject to the following conditions:
- (1) Soil contaminated with hydrocarbons must be deposited in layers less than 0.3 meters; and
 - (2) Soil contaminated with hydrocarbons must be deposited a minimum of 1.2 meters above the seasonal high groundwater level and a minimum of 2.0 meters below the final grade of the landfill to prevent the impact on groundwater and any future vegetation on the site.
- 1.1.6** Composting of yard waste must be in accordance with the Organic Matter Recycling Regulation under the *Environmental Management Act*.
- 1.1.7** The discharged waste must originate from within the Regional District of Central Okanagan and Big White area, subject to the following:
- (a) Waste discharged to this landfill must satisfy the requirements of the Central Okanagan Regional District Solid Waste Management Plan.
 - (b) Waste discharged to this landfill must not contravene the Regional Solid Waste Management Plan of the Regional District from which the waste originated.
- 1.1.8** The works authorized are a sanitary landfill and related appurtenances as specified in the approved Design and Operations Plan. The landfill and

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any new works must be operated to meet or surpass the requirements for a sanitary landfill as described in the *BC Landfill Criteria for Municipal Solid Waste* unless otherwise approved by the Director.

1.1.9 Municipal solid waste that has value for the purposes of reuse or reprocessing must be considered recyclable material. Recyclable materials may be diverted from disposal and temporarily stored at the landfill facility prior to removal from the site. The nature of the recyclable material authorized for storage at the landfill facility must be to the satisfaction of the Director.

2. OPERATING REQUIREMENTS

2.1 Design, Operations and Closure Plans

- 2.1.1** The City must submit a Design, Operations and Closure Plan prepared by a suitably qualified professional for approval by the Director by June 30, 2016, and a Financial Security Plan by June 30, 2017. The Design, Operations and Closure Plan must address, but not be limited to, each of the subsections in the Landfill Criteria for Municipal Solid Waste unless otherwise approved by the Director, including performance, siting, design, operational, closure and post-closure criteria. The facilities must be developed, operated and closed in accordance with the Design, Operations and Closure Plan. Should there be any inconsistency between this Operation Certificate and the Design, Operations and Closure Plan, this Operational Certificate must take precedence.
- 2.1.2** The Design, Operations and Closure plans must be reviewed every 5 years throughout the operating life of the landfill and updated to encompass the next 10 years of landfill operation and/or post-closure activities. The updated landfill design, operating and closure plans must be prepared by a professional engineer or geoscientist licensed to practice in the province of British Columbia and knowledgeable in such matters. The updated plans must be submitted to the Director for approval and must include any information relevant to the design, operations, closure and post-closure care of the landfill.
- 2.1.3** The landfill facility must be constructed and maintained in accordance with the approved Design, Operations and Closure plans and subject to the conditions set therein. A knowledgeable professional engineer must carry out field reviews of the landfill construction and installation of

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works. As-constructed drawings of the landfill and all works, including elevations relative to a common datum, must be submitted (or retained on site) to the Director. The as-constructed drawings must be sealed by a professional engineer or geoscientist who is licensed to practice in the province of British Columbia and knowledgeable in the appropriate field of study.

- 2.1.4** Written authorization from the Director must be obtained prior to implementing any changes to the approved plans. Based on any information obtained in connection with this facility, the Director may require revision of, or addition to, the design, operations and closure plans.
- 2.1.5** The following design, operations and closure plans are approved:
- (1) Comprehensive Site Development Plan for Glenmore landfill, dated August 2001, prepared by CH2MHill.
 - (2) Comprehensive Site Development Plan for Glenmore landfill, dated June 2008, prepared by CH2MHill.
 - (3) Landfill Gas Management Facilities Design Plan (Final) Glenmore Landfill site, dated January 2012, prepared by CH2MHill
- 2.1.6** In accordance with Section 40 of the *Environmental Management Act* and Part 2 of the Contaminated Sites Regulation, the Operational Certificate holder must submit a site profile to the Director at least ten days prior to decommissioning the facilities authorized in Section 1.

2.2 Qualified Professionals

All information, including plans, drawings, assessments, investigations, surveys, programs and reports, must be certified by a qualified professional. As-built plans and drawings of the facilities and works must be certified by a qualified professional

2.2.1 "qualified professional" means a person who:

- (a) is registered in British Columbia with his or her appropriate professional association, acts under that professional association's code of ethics, and is subject to disciplinary action by that professional association; and

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- (b) through suitable education, experience, accreditation and knowledge may be reasonably relied on to provide advice within his or her area of expertise as it relates to this Operational Certificate

2.3 Maintenance of Works and Emergency Procedures

The authorized works must be inspected regularly and maintained in good working order. In the event of an emergency or condition beyond the control of the City of Kelowna including, but not limited to, unauthorized fires arising from spontaneous combustion or other causes, or detection of surfacing leachate on the property, the City of Kelowna must take appropriate remedial action and notify the Regional Ministry Office. The Director may reduce or suspend operations to protect the environment until the authorized works has been restored, and/or corrective steps taken to prevent unauthorized discharges.

2.4 Additional Information, Facilities or Works

The Director may, in writing, require investigations, surveys, the submission of additional information, and the construction of additional facilities or works. The Director may also, in writing, amend the information, including plans, drawings, assessments, investigations, surveys, programs and reports, required by this Operational Certificate. Any amendments to the information are without effect unless the Director has approved of such amendments in writing.

2.5 Landfill Site Development

- 2.5.1** In accordance with the approved Design, Operations and Closure Plan, surface water diversions and groundwater drainage works must be installed to prevent surface water run-off and groundwater seepage from entering the waste discharge area. The effect of sediment transport from areas upgradient and within the landfill site must be considered when designing, installing and maintaining the surface water diversion system. Diversion and drainage structures must be maintained by the Operational Certificate Holders on a regular basis to the satisfaction of the Director.
- 2.5.2** A berm of suitable material must be constructed to limit visibility of the active waste discharge area where practical for travellers using the Glenmore Road and John Hindle Drive.

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- 2.5.3** The buffer zone between any municipal solid waste discharged and the property boundary is to be at least 50 metres of which the 15 metres closest to the property boundary must be reserved for natural or landscaped screening (berms or vegetative screens). Depending on adjacent land use and environmental factors, buffer zones of less than 50 metres but not less than 15 metres may be authorized by the Director.

2.6 Waste Compaction and Coverage

- 2.6.1** The City must ensure that waste deposition and compaction meets or exceeds the requirements specified in the latest version of the Landfill Criteria for Municipal Solid Waste for daily, intermediate and final cover unless otherwise approved by the Director. Control must be exercised to ensure keeping freshly deposited refuse in a well defined and small/manageable working face.

Discharged wastes must be compacted and cover material applied as outlined in section 2.6. Wastes must be compacted and covered on a continuous basis. However, if operations are reduced to less than 24 hours per day, then provisions such as security, fencing, and/or other measures approved by the Director must be deployed to prevent wildlife access. All wastes must be covered within 24 hours of discharge to the landfill.

- 2.6.2** The area of the active landfill working face must be minimized as much as possible. Wastes must be spread in thin layers of 60 centimetres, or less, on the working face and compacted. A compacted layer of at least 15 centimetres of suitable soils, or a functionally equivalent depth of other cover material acceptable to the Director, must be placed on all exposed compacted waste.
- 2.6.3** An intermediate cover of at least 30 centimetres of compacted soils, or a functionally equivalent depth of other cover material acceptable to the Director, must be applied on any areas of the active landfill site to which waste will not be discharged for a period of 30 days or more.

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- 2.6.4** Final cover must be installed within 180 days of completion of the landfill to the final elevations as specified in the approved plans. Completed portions of the landfill must progressively receive final cover during the active life of the landfill. Final cover must consist of at least 1 metre of low permeability compacted mineral soil, overlain by at least 15 centimetres of topsoil capable of supporting indigenous vegetation. With the written approval of the Director, the topsoil used for this final covering may be mixed with conditioning agents such as sludge (biosolids), compost and the like to add organics and improve the moisture holding capacity and nutrient value of the soil. Final cover must be constructed and maintained with adequate drainage and erosion controls and seeded with suitable grasses.
- 2.6.5** The Director may vary the frequency of covering when freezing conditions adversely affect normal operation.

2.7 Landfill Management

- 2.7.1** The landfill must be supervised to the satisfaction of the Director. Landfill supervisors must be trained in landfill operations pertaining to the conditions of this Operational Certificate and the approved design, operating and closure plans. Personnel must be trained to industry standards and at least one employee of the City must be trained and certified as a Manager of Landfill Operations or a British Columbia Qualified Landfill Operator by the Solid Waste Association of North America or equivalent.
- 2.7.2** Access to the site must be controlled and supervised. All access points must have locking gates and must be locked during periods when supervision is not available.
- 2.7.3** Public scavenging and salvaging of waste at the landfill site is prohibited. Designated safe areas for reuse as identified by the City of Kelowna will be permitted.
- 2.7.4** Designated areas must be maintained for the storage of recyclable materials. These designated area(s) must be separate from the active landfill area and must be maintained free of litter. Storage of recyclable materials at the landfill site must be limited to a reasonable length of time subject to the approval of the Director.

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- 2.7.5** Litter and wind strewn waste must be controlled by limiting the area of the working face, installing a wind blown litter collection fence in a location which is in the anticipated prevailing downwind direction of the landfill working face, instituting a regular litter pickup, general good site maintenance practises or any other measures required by the Director.
- 2.7.6** The landfill must be operated in a manner acceptable to the Director to reduce the potential of public nuisance.
- 2.7.7** The landfill must be operated so as not to create a significant threat to public health or safety, with respect to landfill gas, odours, unauthorized access, roads, traffic, airport activity, noise, dust, litter, vectors, or wildlife attraction using methods and materials acceptable to the Director.
- 2.7.8** Open burning of waste is prohibited. It is recognized that open burning may be required at the landfill when volumes of wood waste stored at the landfill become large, or shipping wastes to offsite solutions become unfeasible. The City will apply to the Director for a burning permit as needed.
- 2.7.9** The landfill must be operated so as to minimize the attraction of nuisance wildlife and disease vectors such as birds and rodents by applying adequate cover to the waste and by maintaining the site free of litter. Additional control measures may be specified by the Director if wildlife and/or vector attraction to the site becomes a public safety hazard.
- 2.7.10** The landfill works must be inspected on a regular basis by the landfill supervisor. In the event of an emergency or any condition, which prevents continuing operation of the approved method of landfill operation and control, or results in non-compliance with the terms and conditions of this Operational Certificate, the Director must be notified immediately and appropriate remedial action taken.
- 2.7.11** The Director may require future upgrading of the landfill control works to protect the environment during the operating life of the landfill and for a minimum post-closure period of 25 years.

2.8 Ground and Surface Water Quality Impairment

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The quality of ground and surface water at the property boundary must not exceed the appropriate (e.g. freshwater aquatic life, drinking water, etc.) water quality criteria in the British Columbia Approved Water Quality Guidelines and A Compendium of Working Water Quality Guidelines for British Columbia, as amended from time to time, or their replacements approved by the Director in writing. Where natural background water quality exceeds the appropriate water quality criteria, the quality of ground and surface water at the property boundary must not exceed natural background water quality. Water quality criteria from other jurisdictions can only be used for contaminants which have not been dealt with in the British Columbia Guidelines. After considering existing and potential future uses of ground and surface water, a qualified professional may recommend the appropriate water quality criteria. The appropriate water quality criteria are subject to the approval of the Director in writing.

If excursions result to the specified water quality criteria, the Director may require that leachate management control measures or works be undertaken. Terms of reference for any leachate management study and/or design work is subject to the authorization of the Director.

2.9 Landfill Gas Management

The Landfill must not cause combustible gas concentrations to exceed the lower explosive limit in soils at the property boundary or 20% of the lower explosive limit at or in on-site or off-site structures.

The City must ensure that the facility is in compliance with the requirements of the Landfill Gas Management Regulation under the *Environmental Management Act*.

3. MONITORING

3.1 Environmental Protection Monitoring

The City must implement and maintain ground, surface water, leachate collection sump fluids and landfill gas monitoring programs prepared by a qualified professional in accordance with the monitoring programs approved in the Design, Operations and Closure plans approved by the Director. The monitoring programs must identify potential environmental impacts of the authorized facility and must address but not be limited to the Landfill Criteria for Municipal Solid Waste and Guidelines for Environmental Monitoring. It must take into

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consideration results from previous monitoring programs and any other investigations conducted at the site to ensure that early detection of potential impacts is possible.

The monitoring programs must be reviewed in the annual report required under section 4.2. Based on the information submitted in the annual report, or any other information obtained in connection with this site, the Director may vary the frequency, location and analyses of ground and surface water, leachate collection sump fluid and landfill gas sampling.

3.2 Management of Leachate Collection System Fluid

Leachate collection sump fluid levels must be monitored and fluid removed from the leachate collection system as specified in the approved design, operating and closure plans. A sample of fluid from each of the leachate collection sumps must be collected on a quarterly basis and laboratory analyses obtained for the leachate indicator parameters identified in the monitoring program. The Director may vary the location and frequency of sampling and analyses of leachate collection system fluid should conditions warrant. Fluid recovered from the leachate collection system may be used within the landfill footprint for irrigation, dust suppression and/or re-circulated within the buried waste as well as directed to the Kelowna Wastewater Treatment facility unless otherwise directed by the Director. Other methods of treatment and/or disposal of the leachate collection sump fluids must have the prior approval of the Director.

3.3 Groundwater Contamination by Leachate

Should it be determined that leachate is being generated and carried in the groundwater or surface water and, in the opinion of the Director, requires interception and treatment, appropriate remedial measures as approved by the Director must be implemented.

4. REPORTING

4.1 Interim Reporting and Record Keeping

The leachate collection sump fluid level readings, groundwater elevation and combustible gas monitoring data, and the sump fluid, groundwater and gas sampling analyses results must be available for inspection at the Glenmore Landfill office. Data from monitoring and sample analysis must be submitted to the Director with the annual report in accordance with section 7.2. Between

Date issued: December 8, 2000
Date amended: June 29, 2015
(most recent)



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Southern Interior Region - Okanagan

annual reporting events, the Director must be promptly informed of any significant changes from long term trends observed in the parameters that are monitored.

4.2 Annual Report

An annual report must be electronically submitted by March 31 of each year for the previous calendar year of landfill operation or post-closure activities. The report should contain the Annual Environmental Monitoring Report and the Annual Operation Report.

The Annual Environmental Monitoring Report must include:

- Results of the environmental monitoring program.
- Data tabulation, comparison to performance criteria, interpretation, trend analysis, graphs, etc.
- Identification of any current or predicted future non-compliance with performance criteria.
- Conclusions, recommendation and proposed changes to the environmental monitoring program.

The Annual Operation Report should include at a minimum:

- Total volume, tonnage, and types of waste discharged into the landfill for the year.
- Types and tonnages of waste that were not directly disposed of into the landfill such as recycled, composted, etc.
- Leachate quantities collected, treated and discharged.
- Landfill gas quantities collected, flared and utilized. If applicable, an annual report should be done in the format required by the Landfill Gas Management Regulation and submitted either separately or as a part of the Annual Report.
- Operational plan for the next 12 months.
- Remaining site life and capacity.
- Closure works completed.
- Any changes from approved reports, plans and specifications.
- Any complaints received and the action taken as a result of a complaint.
- Financial Security Plan update.
- Identification of any non-compliance with the Solid Waste Management Plan, operational certificate and a proposed action plan

Date issued:
Date amended:
(most recent)

December 8, 2000
June 29, 2015



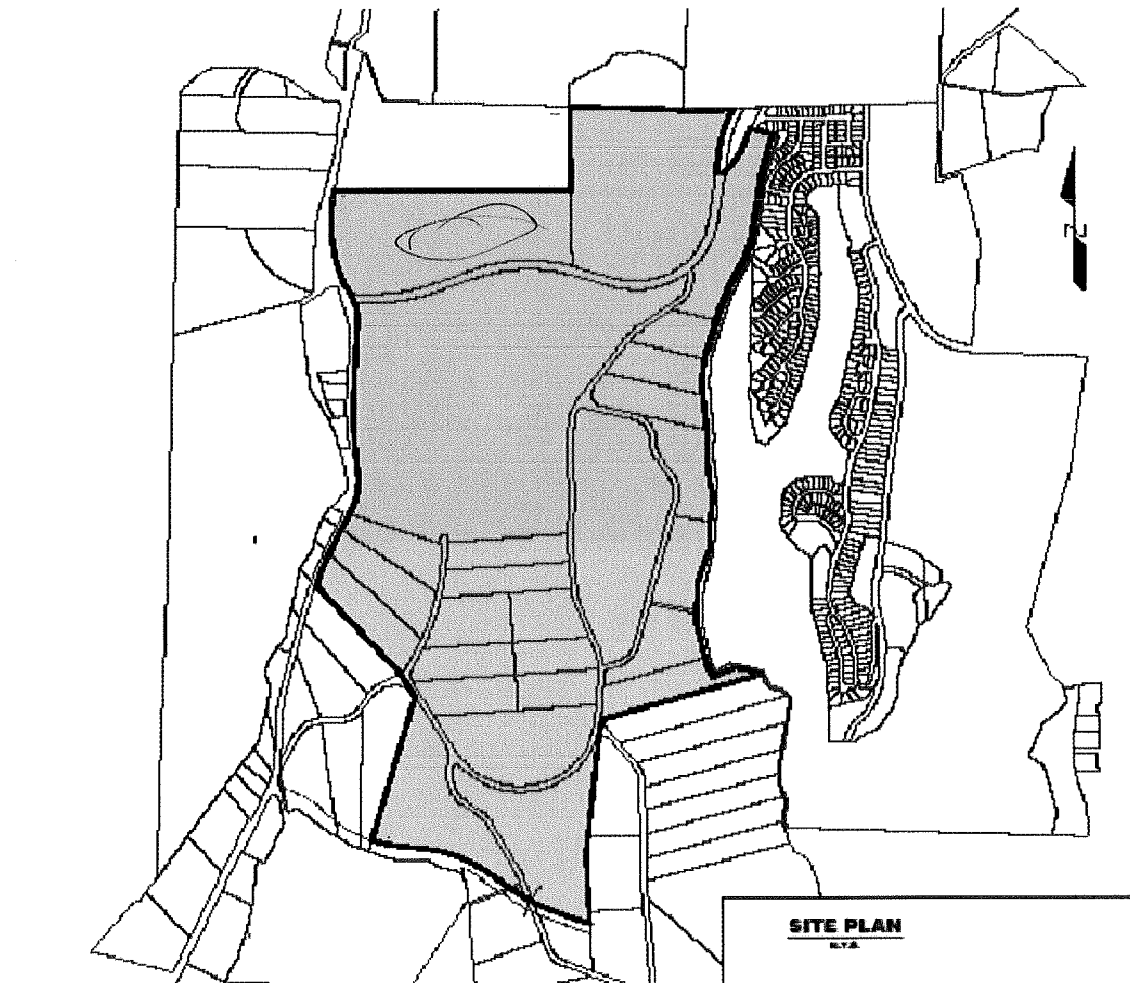
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and schedule to measure the performance of the proposed measures in achieving compliance.

- If possible: compaction, waste to cover ratio and airspace utilization factor.

Copies of the annual report must be provided to the public library in Kelowna and posted on the Operational Certificate holder's web sites.

SITE PLAN



Date issued: December 8, 2000
Date amended: June 29, 2015
(most recent)

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LOCATION MAP



Date issued: December 8, 2000
Date amended: June 29, 2015
(most recent)

A handwritten signature in black ink, appearing to read 'Carol Danyluk'.

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for Director, *Environmental Management Act*
Southern Interior Region - Okanagan

APPENDIX D
2022 COK FIELD RECORDS

*Intermittent only -
spill monitor*

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun / clouds
Temperature: 20°

Date: 26-Sept-22
Tech: RP

Well No: GL-1
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 14:31
Depth of Water (A): 2.344 m
Bottom of Well (B): -
Well Condition: good

One Well Volume: -
Diameter of Well: -
(B-A)*2 - Litres for 51mm ϕ well
(B-A)*8 - Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 - pH 7 - pH10 -
1413 μ S/cm - 5000 μ S/cm - DO -

Pump Details: -

WELL DEVELOPMENT

Purge Volume: Well Vol. X - = - Sample Intake Depth: Bottom - 0.5m
Average Flow Rate: -

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
14:37	0.9	11.3	7.68	1854	-73.3	2.86	2.456	clear. 250 mL/min.
14:40	1.5	10.8	7.61	1846	-71.1	2.09	2.471	
14:43	2.2	10.7	7.54	1851	-66.8	1.37	~~2.472~~ 2.472	
14:46	2.9	10.7	7.47	1856	-66.0	0.95	~~2.476~~ 2.476	
14:49	3.6	10.7	7.43	1856	-64.2	0.79	2.475	
14:52	4.2	10.8	7.42	1851	-62.6	0.72	2.475	
		- Sample -						

Odour: ☐ Yes ☒ No If Yes, describe -

Sheen: ☐ Yes ☒ No If Yes, describe -

Turbidity: Clear (1) ||||| Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	~~X~~					☐ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun/cloud
Temperature: 24°C

Date: 26-Sept-22
Tech: RSB

Well No: GL1-2
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 15:08
Depth of Water (A): 2.441
Bottom of Well (B): -
Well Condition: good

One Well Volume: -
Diameter of Well: -
(B-A)*2 - Litres for 51mm ϕ well
(B-A)*8 - Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 - pH 7 - pH10 -
1413 μ S/cm - 5000 μ S/cm - DO -

Pump Details: 1/4" hose

WELL DEVELOPMENT

Purge Volume: Well Vol. X - = - Sample Intake Depth: bottom - 0.5m
Average Flow Rate: -

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
15:12	0.8	12.3	7.48	1838	-60.2	2.64	2.452	Clear - 230ml/min
15:15	1.4	11.4	7.40	1832	-59.0	0.57	2.451	
15:18	2.1	11.7	7.37	1821	-58.7	0.38	2.453	
15:21	2.9	11.7	7.35	1822	-58.8	0.27	2.454	
15:24	3.8	11.7	7.35	1826	-59.2	0.24	2.453	
			- sample -					

Odour: ☐ Yes ☒ No If Yes, describe -

Sheen: ☐ Yes ☒ No If Yes, describe -

Turbidity: Clear (1) Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	X					☐ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Well No: 9226 GLZ-1
Field Dup: -

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 ✓_____ pH10 ✓_____

1413 $\mu\text{S}/\text{cm}$ 5000 $\mu\text{S}/\text{cm}$ ✓_____ DO ✓_____

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: Bottom - 1m
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☒ 1 ☒ 2 ☒ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

Crystals sheer on water column surface in well. None visible on sample water. Tubing showed red.

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: SUN
Temperature: 20°C

Date: 27-Sept-2022
Tech: RB

Well No: GL2-2
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 11:34 am
Depth of Water (A): 0.630
Bottom of Well (B):
Well Condition:

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
 - ☐ Hydrolift
 - ☐ Bailer
 - ☒ Peristaltic
 - ☐ Bladder
- Pump Details

Multi-meter Model: YSI Pro

- ☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH10

1413 μ s/cm 5000 μ s/cm f DO 4

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: Bottom - 1m

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheep: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Well No: GL4-1
Field Dup: 001

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 ✓ _____ pH10 ✓ _____
 1413µS/cm 5000µS/cm ✓ DO ✓ _____

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: bottom - 0.6
Average Flow Rate: _____

[illegible]

Turbidity: Clear (1) | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☐ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun
Temperature: 15°C

Date: 27-sept-22
Tech: RS

Well No: GL4-2
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 09:46
Depth of Water (A): 2.261
Bottom of Well (B): _____
Well Condition: good.

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: 1/4" hose.

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ✓ pH10 ✓
1413 μ S/cm _____ 5000 μ S/cm ✓ DO ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: bottom - 0.5m

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
09:50	0.9	13.6	7.44	2116	-62.2	1.09	2.604	clear. ~150ml/min
09:52	1.3	13.9	7.40	2119	-62.4	0.60	2.751	~120ml/min
10:00	1.7	14.3	7.39	2118	-62.8	0.45	2.881	~100ml/min
10:03	1.8	14.5	7.38	2121	-62.8	0.38	2.976	
10:06	2.2	14.6	7.39	2120	-62.9	0.37	3.037	
10:09	2.5	14.8	7.38	2123	-62.9	0.33	3.110	
			- sample -					

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☐ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun Date: 5-06-20 Well No: GL12-1
 Temperature: 24.2 Tech: BS Field Dup: ✓

MONITORING WELL INFORMATION

Time of Measurement: 05:00 PM 11:21 One Well Volume: _____
 Depth of Water (A): 2.269 Diameter of Well: _____
 Bottom of Well (B): _____ (B-A)*2 _____ Litres for 51mm ϕ well
 Well Condition: _____ (B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

☐ Waterra Multi-meter Model: YSI Pro
☐ Hydrolift ☐ Field Bump ☒ Field Calibration
☐ Bailer pH 4 _____ pH 7 _____ pH10 _____
☒ Peristaltic 1413 μ S/cm _____ 5000 μ S/cm _____ DO _____
☐ Bladder
 Pump Details: _____

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: bottom - 1m
 Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
1430	0.6	22.0	6.85	7867	-22.0	1.82	2.511	yellow tint
1433	1.7	21.6	6.70	7773	-22.7	0.42	2.919	
1436	2.5	21.6	6.67	7767	-22.4	0.30	3.186	
1439	3.2	21.5	6.66	7772	-22.2	0.21	3.412	zone for
1442	4.6	21.8	6.65	7783	-22.1	0.26	3.506	
1445	5.1	21.8	6.64	7800	-22.1	0.26	3.578	
1448	5.6	21.8	6.64	7801	-22.4	0.17	3.664	

Odour: ☒ Yes ☐ No If Yes, describe musty
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear 11 Very Silty yellow tint. pee-like

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun
Temperature: 12.0°C

Date: 5-01-11
Tech: BS + AG

Well No: GLIS-1
Field Dup:

MONITORING WELL INFORMATION

Time of Measurement: 10:36
Depth of Water (A): 4.066
Bottom of Well (B):
Well Condition:

One Well Volume:
Diameter of Well:
(B-A)*2 Litres for 51mm ϕ well
(B-A)*8 Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details:

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 pH 7 ✓ pH10 ✓
1413 μ S/cm 5000 μ S/cm ✓ DO ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X = Sample Intake Depth:
Average Flow Rate:

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
10:44	0.6	12.4	7.75	1401	908.8	2.23	4.351	clear ~25ml/min
10:47	1.4	12.0	7.55	1319	-68.5	1.19	4.780	
10:51	1.9	12.6	7.52	1288	-67.2	1.06	4.889	
10:54	2.3	12.9	7.52	1290	-68.1	0.95	5.000	120 ml/min
10:57	2.6	13.0	7.52	1292	-68.1	0.97	5.140	88ml/min
11:00	2.9	13.9	7.52	1276	-68.9	0.89	5.232	
11:03	3.1	13.6	7.54	1292	-68.8	0.91	5.312	
								- sample

Odour: ☐ Yes ☒ No If Yes, describe
Sheen: ☐ Yes ☒ No If Yes, describe
Turbidity: Clear ☒ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☐ Yes ☒ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: SM
Temperature: 20.0

Date: 21-Sept-22
Tech: BS

Well No: EG-15-2
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 15:13
Depth of Water (A): 1.989
Bottom of Well (B): 6.4
Well Condition: _____

One Well Volume: 4.4 x 2 = 8.8L
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☒ Waterra
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☐ Bladder
Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☐ Field Calibration
pH 4 _____ pH 7 _____ pH10 _____
1413 μ S/cm _____ 5000 μ S/cm _____ DO _____

*Re-development of well due to some debris in going down
well pipe (cow hair + dust)*

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
1526	18							the some brown silt
1533	36							some brown silt
1538	50							"
								75 well volumes removed.

Odour: ☐ Yes ☐ No If Yes, describe _____
Sheen: ☐ Yes ☐ No If Yes, describe _____
Turbidity: Clear ☐ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☐ No	
Metals	X Plastic ☐ Glass		1				☐ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☐ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☐ No	
Organic C	☐ Plastic X Glass	2					☐ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun
Temperature: 20.2

Date: 5-OCT-2022
Tech: BCB

Well No: GLIS-2
Field Dup: DUP2

MONITORING WELL INFORMATION

Time of Measurement: 11:28
Depth of Water (A): 3.341
Bottom of Well (B):
Well Condition:

One Well Volume:
Diameter of Well:
(B-A)*2 Litres for 51mm ϕ well
(B-A)*8 Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 pH 7 pH10
1413 μ S/cm 5000 μ S/cm DO

Pump Details: single use LDPE tubing.

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	200 Comments
11:43	0.5	14.4	7.17	7359	-40.1	6.07	3.381	clear.
11:46	1.2	13.8	7.05	7311	-40.4	5.12	3.392	"
11:49	1.8	13.7	7.02	7216	-41.6	5.12	3.401	"
11:52	2.5	13.7	7.00	7316	-38.4	5.19	3.405	"
			- sample -					

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear DI ||||| Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud
Temperature: 15°C

Date: 28-Sept-22
Tech: RS

Well No: GLB-1
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 0950 One Well Volume: _____
Depth of Water (A): 0.010 Diameter of Well: _____
Bottom of Well (B): _____ (B-A)*2 _____ Litres for 51mm ϕ well
Well Condition: no evidence of past leakage (B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

☐ Waterra Multi-meter Model: YSI Pro
☐ Hydrolift ☐ Field Bump ☒ Field Calibration
☐ Bailer pH 4 _____ pH 7 _____ pH10 _____
☒ Peristaltic 1413 μ S/cm _____ 5000 μ S/cm _____ DO _____
☐ Bladder
Pump Details: installed new 1/4" HDPE to bottom.

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: bottom - 1m
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
10:05	0.9	14.9	7.29	2481	-58.2	1.25	0.275	~25mL/min
10:08	1.3	15.1	7.25	2483	-57.9	0.53	0.321	clear w/ black flecks
10:11	1.6	15.2	7.25	2483	-57.5	0.41	0.432	
10:14	2.0	15.2	7.25	2489	-57.0	0.33	0.511	
		- sample -						

Odour: ☒ Yes ☐ No If Yes, describe slight sulfur like smell
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Well No: GL20-1
Field Dup: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

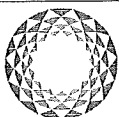
Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 ✓ pH10 ✓
 1413 μ S/cm 5000 μ S/cm ✓ DO ✓

[illegible]

Odour: ☒ Yes ☐ No If Yes, describe sewage like
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50 ☐ 51 ☐ 52 ☐ 53 ☐ 54 ☐ 55 ☐ 56 ☐ 57 ☐ 58 ☐ 59 ☐ 60 ☐ 61 ☐ 62 ☐ 63 ☐ 64 ☐ 65 ☐ 66 ☐ 67 ☐ 68 ☐ 69 ☐ 70 ☐ 71 ☐ 72 ☐ 73 ☐ 74 ☐ 75 ☐ 76 ☐ 77 ☐ 78 ☐ 79 ☐ 80 ☐ 81 ☐ 82 ☐ 83 ☐ 84 ☐ 85 ☐ 86 ☐ 87 ☐ 88 ☐ 89 ☐ 90 ☐ 91 ☐ 92 ☐ 93 ☐ 94 ☐ 95 ☐ 96 ☐ 97 ☐ 98 ☐ 99 ☐ 100 ☐ 101 ☐ 102 ☐ 103 ☐ 104 ☐ 105 ☐ 106 ☐ 107 ☐ 108 ☐ 109 ☐ 110 ☐ 111 ☐ 112 ☐ 113 ☐ 114 ☐ 115 ☐ 116 ☐ 117 ☐ 118 ☐ 119 ☐ 120 ☐ 121 ☐ 122 ☐ 123 ☐ 124 ☐ 125 ☐ 126 ☐ 127 ☐ 128 ☐ 129 ☐ 130 ☐ 131 ☐ 132 ☐ 133 ☐ 134 ☐ 135 ☐ 136 ☐ 137 ☐ 138 ☐ 139 ☐ 140 ☐ 141 ☐ 142 ☐ 143 ☐ 144 ☐ 145 ☐ 146 ☐ 147 ☐ 148 ☐ 149 ☐ 150 ☐ 151 ☐ 152 ☐ 153 ☐ 154 ☐ 155 ☐ 156 ☐ 157 ☐ 158 ☐ 159 ☐ 160 ☐ 161 ☐ 162 ☐ 163 ☐ 164 ☐ 165 ☐ 166 ☐ 167 ☐ 168 ☐ 169 ☐ 170 ☐ 171 ☐ 172 ☐ 173 ☐ 174 ☐ 175 ☐ 176 ☐ 177 ☐ 178 ☐ 179 ☐ 180 ☐ 181 ☐ 182 ☐ 183 ☐ 184 ☐ 185 ☐ 186 ☐ 187 ☐ 188 ☐ 189 ☐ 190 ☐ 191 ☐ 192 ☐ 193 ☐ 194 ☐ 195 ☐ 196 ☐ 197 ☐ 198 ☐ 199 ☐ 200 ☐ 201 ☐ 202 ☐ 203 ☐ 204 ☐ 205 ☐ 206 ☐ 207 ☐ 208 ☐ 209 ☐ 210 ☐ 211 ☐ 212 ☐ 213 ☐ 214 ☐ 215 ☐ 216 ☐ 217 ☐ 218 ☐ 219 ☐ 220 ☐ 221 ☐ 222 ☐ 223 ☐ 224 ☐ 225 ☐ 226 ☐ 227 ☐ 228 ☐ 229 ☐ 230 ☐ 231 ☐ 232 ☐ 233 ☐ 234 ☐ 235 ☐ 236 ☐ 237 ☐ 238 ☐ 239 ☐ 240 ☐ 241 ☐ 242 ☐ 243 ☐ 244 ☐ 245 ☐ 246 ☐ 247 ☐ 248 ☐ 249 ☐ 250 ☐ 251 ☐ 252 ☐ 253 ☐ 254 ☐ 255 ☐ 256 ☐ 257 ☐ 258 ☐ 259 ☐ 260 ☐ 261 ☐ 262 ☐ 263 ☐ 264 ☐ 265 ☐ 266 ☐ 267 ☐ 268 ☐ 269 ☐ 270 ☐ 271 ☐ 272 ☐ 273 ☐ 274 ☐ 275 ☐ 276 ☐ 277 ☐ 278 ☐ 279 ☐ 280 ☐ 281 ☐ 282 ☐ 283 ☐ 284 ☐ 285 ☐ 286 ☐ 287 ☐ 288 ☐ 289 ☐ 290 ☐ 291 ☐ 292 ☐ 293 ☐ 294 ☐ 295 ☐ 296 ☐ 297 ☐ 298 ☐ 299 ☐ 300 ☐ 301 ☐ 302 ☐ 303 ☐ 304 ☐ 305 ☐ 306 ☐ 307 ☐ 308 ☐ 309 ☐ 310 ☐ 311 ☐ 312 ☐ 313 ☐ 314 ☐ 315 ☐ 316 ☐ 317 ☐ 318 ☐ 319 ☐ 320 ☐ 321 ☐ 322 ☐ 323 ☐ 324 ☐ 325 ☐ 326 ☐ 327 ☐ 328 ☐ 329 ☐ 330 ☐ 331 ☐ 332 ☐ 333 ☐ 334 ☐ 335 ☐ 336 ☐ 337 ☐ 338 ☐ 339 ☐ 340 ☐ 341 ☐ 342 ☐ 343 ☐ 344 ☐ 345 ☐ 346 ☐ 347 ☐ 348 ☐ 349 ☐ 350 ☐ 351 ☐ 352 ☐ 353 ☐ 354 ☐ 355 ☐ 356 ☐ 357 ☐ 358 ☐ 359 ☐ 360 ☐ 361 ☐ 362 ☐ 363 ☐ 364 ☐ 365 ☐ 366 ☐ 367 ☐ 368 ☐ 369 ☐ 370 ☐ 371 ☐ 372 ☐ 373 ☐ 374 ☐ 375 ☐ 376 ☐ 377 ☐ 378 ☐ 379 ☐ 380 ☐ 381 ☐ 382 ☐ 383 ☐ 384 ☐ 385 ☐ 386 ☐ 387 ☐ 388 ☐ 389 ☐ 390 ☐ 391 ☐ 392 ☐ 393 ☐ 394 ☐ 395 ☐ 396 ☐ 397 ☐ 398 ☐ 399 ☐ 400 ☐ 401 ☐ 402 ☐ 403 ☐ 404 ☐ 405 ☐ 406 ☐ 407 ☐ 408 ☐ 409 ☐ 410 ☐ 411 ☐ 412 ☐ 41

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

yellow-brown, very silky.



City of
Kelowna

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

*Leachate spill monitoring.
interim only*

Weather: sun/clouds
Temperature: 22°C

Date: 26-sept-22
Tech: PSF

Well No: G223-1
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 13:40
Depth of Water (A): 2.161
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ~ pH10 ~
1413 μ S/cm _____ 5000 μ S/cm ~ DO ~

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: bottom - 0.75m

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
13:47	0.9	12.7	7.03	2387	-39.1	6.92	2.521	clear
13:50	1.6	12.2	7.03	2374	-42.9	1.40	2.721	$\rightarrow \sim 190 \text{ mL/min}$
13:53	2.2	12.4	7.01	2376	-41.6	0.95	2.919	$\rightarrow \sim 140 \text{ mL/min}$
13:56	2.6	13.2	6.99	2363	-40.6	0.82	3.014	
13:59	~~2.6~~ 3.0	13.2	6.99	2378	-40.2	0.82	3.062	
14:02	3.5	13.3	6.98	2380	-39.7	0.64	3.121	
			- sample -					

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	~~X~~					☐ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

internal only



City of
Kelowna

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud
Temperature: 10°C

Date: 31-OCT-2022
Tech: RSB

Well No: G224-1
Field Dup: G224-1

MONITORING WELL INFORMATION

Time of Measurement: 13:29
Depth of Water (A): 2.66m
Bottom of Well (B): 6.0
Well Condition: _____

One Well Volume: 3.34 x 2 = 6.6
Diameter of Well: 2"
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☒ Waterra
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro

☐ Field Bump ☐ Field Calibration

pH 4 _____ pH 7 _____ pH10 _____

1413 μ S/cm _____ 5000 μ S/cm _____ DO _____

Pump Details: _____ well required in Oct - re-developing prior to sampling

WELL DEVELOPMENT

Purge Volume: Well Vol. X 5 = 33L
Average Flow Rate: _____

Sample Intake Depth: bottom

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
1:40	8						Sum	dirty w/ pine needles, lots of sand/silt/dirt
								dry - recharging
1:49	13L						Sum	clearing but still dirty
1:58								
2:00							2.75	start
2:01	17						dry	less dirty.
2:07	20						2.67	recharged.
2:23								
2:29	21							dry - allow to recharge
2:34							3.000	
2:36	25						Sum	clearer nearly clear

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☐ Very Silty

sufficiently developed.

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☐ No
Metals	X Plastic	☐ Glass		1				☐ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☐ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

Development only - n/s



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Well No: GL24-1
Field Dup: -

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 ✓ pH10 ✓
 1413us/cm 5000us/cm ✓ DO ✓

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear (1) I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☐ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun
Temperature: 24°C

Date: 27-SEP-22
Tech: BS

Well No: G427-1
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 12:21 (4:23)
Depth of Water (A): 1.361
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: _____ YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ✓ pH10 ✓
1413 μ S/cm _____ 5000 μ S/cm ✓ DO ✓

Pump Details: dedicated 1/4" hose to bather

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
14:28	1.0	19.9	7.37	2578	-63.0	1.14	1.616	clear.
14:31	1.3	20.3	7.36	2567	-64.4	0.84	1.701	
14:34	1.5	19.9	7.35	2529	-62.3	0.40	1.800	~110 ml/min
14:37	1.8	20.6	7.35	2570	-62.9	0.30	1.878	~100 ml/min
14:40	2.3	20.8	7.36	2574	-63.3	0.28	1.920	
14:43	2.5	21.0	7.36	2583	-65.1	0.26	1.974	
								- stable, sample ✓

Odour: ☐ Yes ☐ No If Yes, describe _____

Sheen: ☐ Yes ☐ No If Yes, describe _____

Turbidity: Clear ☐ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun/shadow
Temperature: 20°C

Date: 6-OCT-22
Tech: BJS

Well No: GL28-1
Field Dup: AP3

MONITORING WELL INFORMATION

Time of Measurement: 11:43
 Depth of Water (A): 5.237
 Bottom of Well (B): _____
 Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details:

Multi-meter Model: YSI Pro

- ☐ Field Bump ☒ Field Calibration

pH 4 pH 7 ✓ pH10 —

1413us/cm 5000us/cm ✓ DO ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: bottom - 1.5

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear (I) I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun
Temperature: 22°C

Date: 6.06.07
Tech: BSJ

Well No: GL28-2
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 12:36
Depth of Water (A): 4.758
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ✓ pH10 ✓
1413 μ S/cm _____ 5000 μ S/cm ✓ DO ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
12:43	0.8	14.1	7.29	5075	-57.7	6.82		dev.
12:46	1.1	14.3	7.00	5820	-41.3	3.25	4.796	
12:49	1.6	13.7	6.92	5744	-37.6	1.51	4.824	~220mL/min
12:52	2.2	13.4	6.88	5742	-36.6	0.78	4.829	
12:55	2.9	13.0	6.87	5772	-35.5	0.48	4.833	
12:58	3.4	13.0	6.86	5784	-35.9	0.32	4.835	
13:01	3.9	13.2	6.85	5773	-35.5	0.28	4.835	
— sample, stable —								

Odour: ☐ Yes ☒ No If Yes, describe _____
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear 5 ||||| Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun Date: 6-Oct Well No: GL28-3
 Temperature: 29.0 C Tech: RSB Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 1:28 One Well Volume: _____
 Depth of Water (A): 4.712 Diameter of Well: _____
 Bottom of Well (B): _____ (B-A)*2 _____ Litres for 51mm ϕ well
 Well Condition: _____ (B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

☐ Waterra Multi-meter Model: YSI Pro
☐ Hydrolift ☐ Field Bump ☒ Field Calibration
☐ Bailer pH 4 _____ pH 7 ✓ pH10 ✓
☒ Peristaltic 1413 μ S/cm _____ 5000 μ S/cm ✓ DO ✓
☐ Bladder
 Pump Details: _____

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: bottom - 1m
 Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
13:31	0.6	15.0	6.94	8250	-37.8	0.85		-125mL/well
13:34	0.1	14.6	6.90	8210	-34.9	0.45	4.982	clear.
13:37	1.4	14.4	6.88	8232	-36.6	0.31	5.057	
13:40	1.8	14.2	6.86	8222	-35.8	0.23	5.126	
13:43	2.2	14.1	6.85	8180	-36.0	0.21	5.175	
								- sample -

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear 0 ||||| Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun
Temperature: 18°C

Date: 6-07-22
Tech: RSB

Well No: GL29-1
Field Dup: —

MONITORING WELL INFORMATION

Time of Measurement: 10:18
Depth of Water (A): 4.318
Bottom of Well (B): —
Well Condition: —

One Well Volume: —
Diameter of Well: —
(B-A)*2 — Litres for 51mm ϕ well
(B-A)*8 — Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 — pH 7 — pH10 —
1413 μ S/cm — 5000 μ S/cm — DO —

Pump Details: SUB-pump stuck inoperable @ 45m. 1/2" waterra to bottom - vol of waterra ~ 6L.

WELL DEVELOPMENT

Purge Volume: Well Vol. X — = — Sample Intake Depth: —
Average Flow Rate: —

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
10:29	1.2						5.033	yellow tint. sulfur smell.
10:32	2.0						5.485	"
10:35	3.0						5.905	" less smell.
10:38	3.8						6.330	
10:41	4.9						6.82	
10:45	5.7						7.171	
10:46	6.1						7.295	

Odour: ☐ Yes ☒ No If Yes, describe —
Sheen: ☐ Yes ☒ No If Yes, describe —
Turbidity: Clear ||||| Very Silty

Vol of waterra tube ~ 6L

purge only, return to sample

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Pg 2/2

Weather: Sun
Temperature: 24°C

Date: 6-OCT-22
Tech: 180

Well No: GL29-1
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 15:04
Depth of Water (A): 9.616
Bottom of Well (B):
Well Condition:

One Well Volume:
Diameter of Well:
(B-A)*2 Litres for 51mm ϕ well
(B-A)*8 Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details:

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 pH 7 pH10
1413 μ S/cm 5000 μ S/cm DO

return to low flow sampler

WELL DEVELOPMENT

Purge Volume: Well Vol. X = Sample Intake Depth: ~40-45m
Average Flow Rate:

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
15:08	0.5	18.6	7.67	1934	-70.4	1.39	4.829	~130ml/min yellow tint.
15:11	1.0	17.7	7.46	1804	-66.6	0.43	5.045	
15:14	1.4	17.5	7.43	1762	-67.3	0.34	5.209	→ 100ml/min
15:17	1.7	17.8	7.42	1735	-66.8	0.25	5.335	
15:20	2.0	17.9	7.39	1736	-63.6	0.21	5.485	
15:22	2.3	17.7	7.33	1738	-58.6	0.20	5.622	
15:25	2.7	17.7	7.24	1743	-57.6	0.18	5.749	
15:28	2.9	17.6	7.24	1746	-56.1	0.17	5.855	~90ml/min
15:31	3.2	17.7	7.19	1745	-55.7	0.16	5.979	
15:34	3.4	17.6	7.19	1749	-54.4	0.14	6.102	
			-sample-					

Odour: ☐ Yes ☒ No If Yes, describe
Sheen: ☐ Yes ☒ No If Yes, describe
Turbidity: Clear ☒ I ☐ II ☐ III ☐ IV ☐ V ☐ VI ☐ VII ☐ VIII ☐ IX ☐ X ☐ XI ☐ XII ☐ XIII ☐ XIV ☐ XV ☐ XVI ☐ XVII ☐ XVIII ☐ XIX ☐ XX ☐ XXI ☐ XXII ☐ XXIII ☐ XXIV ☐ XXV ☐ XXVI ☐ XXVII ☐ XXVIII ☐ XXIX ☐ XXX ☐ XXXI ☐ XXXII ☐ XXXIII ☐ XXXIV ☐ XXXV ☐ XXXVI ☐ XXXVII ☐ XXXVIII ☐ XXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun
Temperature: 25°C

Date: 5-OCT-22
Tech: BB

Well No: GL29-2
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 15:19
Depth of Water (A): 3.544
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 / pH10 /
1413 μ S/cm _____ 5000 μ S/cm / DO /

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
15:22	0.5	18.5	7.41	8044	-51.0	0.38	3.764	light yellow tint.
15:25	1.2	17.3	7.26	7811	-51.5	0.29	4.035	
15:28	1.8	17.2	7.22	7793	-50.3	0.24	4.297	~130 mL/min
15:31	2.2	18.2	7.19	7707	-50.8	0.23	4.458	~100 mL/min
15:34	2.5	18.7	7.18	7743	-49.6	0.27	4.560	
15:37	2.8	18.9	7.17	7784	-49.8	0.26	4.727	100 mL/min (dial point)
15:40	3.1	19.1	7.17	7806	-50.0	0.27	4.838	
15:43	3.3	19.1	7.17	7817	-49.4	0.20	4.951	
- sample - groundwater will not stabilize. Chem is stable. Stable.								

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50 ☐ 51 ☐ 52 ☐ 53 ☐ 54 ☐ 55 ☐ 56 ☐ 57 ☐ 58 ☐ 59 ☐ 60 ☐ 61 ☐ 62 ☐ 63 ☐ 64 ☐ 65 ☐ 66 ☐ 67 ☐ 68 ☐ 69 ☐ 70 ☐ 71 ☐ 72 ☐ 73 ☐ 74 ☐ 75 ☐ 76 ☐ 77 ☐ 78 ☐ 79 ☐ 80 ☐ 81 ☐ 82 ☐ 83 ☐ 84 ☐ 85 ☐ 86 ☐ 87 ☐ 88 ☐ 89 ☐ 90 ☐ 91 ☐ 92 ☐ 93 ☐ 94 ☐ 95 ☐ 96 ☐ 97 ☐ 98 ☐ 99 ☐ 100 ☐ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud Date: 23-Sep-23 Well No: 6239-1
 Temperature: 18°C Tech: STB Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 8:12 14:48 One Well Volume: _____
 Depth of Water (A): 3.171 Diameter of Well: _____
 Bottom of Well (B): _____ (B-A)*2 _____ Litres for 51mm ϕ well
 Well Condition: _____ (B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

☐ Waterra Multi-meter Model: YSI Pro
☐ Hydrolift ☐ Field Bump ☒ Field Calibration
☐ Bailer pH 4 _____ pH 7 ✓ pH10 ✓
☒ Peristaltic 1413 μ S/cm _____ 5000 μ S/cm ✓ DO ✓
☐ Bladder
 Pump Details: _____

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
 Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
14:50	0.6	13.5	7.19	4954	-46.8	5.00	3.231	clear.
14:53	1.6	12.5	7.05	4929	-40.9	2.33	3.239	
14:56	2.2	12.5	7.00	4959	-39.7	1.84	3.241	275mL/min
15:00	3.1	12.5	6.99	4966	-40.8	1.38	3.236	3.236
15:03	3.8	12.4	6.97	4975	-39.7	1.21	3.238	3.238
15:06	4.4	12.4	6.97	4983	-40.1	1.08	3.237	
		- sample -						

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear 0 ||||| Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloudy
Temperature: 10°C

Date: 23-Sept-27
Tech: BS

Well No: GL39-2
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 15:21
 Depth of Water (A): 3.161
 Bottom of Well (B): _____
 Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details:

Multi-meter Model: YSI Pro

- ☐
- Field Bump
- ☒
- Field Calibration

pH 4 _____ pH 7 ✓ pH10 ✓
1413 μ s/cm 5000 μ s/cm ✓ DO ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: Bottom - 1.0m

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe

Turbidity: Clear Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloudy, wind
Temperature: 20°C

Date: 23-sept-77
Tech: RS

Well No: GL41-1
Field Dup: —

MONITORING WELL INFORMATION

Time of Measurement: 12:41
Depth of Water (A): 2.480
Bottom of Well (B): —
Well Condition: —

One Well Volume: —
Diameter of Well: —
(B-A)*2 — Litres for 51mm ϕ well
(B-A)*8 — Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☒ Bladder
Pump Details: —

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 — pH 7 — pH10 —
1413 μ S/cm — 5000 μ S/cm — DO —

5 Strive/10 vent @ 18psi

WELL DEVELOPMENT

Purge Volume: Well Vol. X — = — Sample Intake Depth: —
Average Flow Rate: —

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
12:53	0.6	16.0	7.54	2205	-69.0	2.02	2.695	clear, 68mL/min
12:56	0.99	15.3	7.51	2165	-68.9	1.63	2.726	
12:59	1.15	14.9	7.48	2150	-67.7	1.48	2.858	
13:02	1.3	14.9	7.47	2145	-67.2	1.44	2.939	
		<u>— stable — sample 2</u>						

Odour: ☐ Yes ☒ No If Yes, describe —
Sheen: ☐ Yes ☒ No If Yes, describe —
Turbidity: Clear (1) ||||| Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	



Weather: cloudy
Temperature: ~19°C

Date: 2-2-22
Tech: (30)

Well No: GL 41-2
Field Dup:

Time of Measurement: 13:04
Depth of Water (A): 2.516
Bottom of Well (B):
Well Condition: good

One Well Volume: _____

Diameter of Well: _____

(B-A)*2 Litres for 51mm ϕ well

(B-A)*8 _____ Litres for 102mm ϕ well

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☒ Bladder

Pump Details

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 pH 7 ☒ pH 10 ☒

1413 μ s/cm 5000 μ s/cm ✓ DO ✓

10/10 @ 20 psi

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ I ☐ II ☐ III ☐ IV ☐ V ☐ VI ☐ VII ☐ VIII ☐ IX ☐ X ☐ XI ☐ XII ☐ XIII ☐ XIV ☐ XV ☐ XVI ☐ XVII ☐ XVIII ☐ XIX ☐ XX Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud
Temperature: 18°C

Date: 23-Sept 22
Tech: RJS

Well No: GL41-3
Field Dup: 7

MONITORING WELL INFORMATION

Time of Measurement: 13:39
Depth of Water (A): 2.481
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☒ Bladder

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 ☒ pH10 ☒

1413 μ S/cm _____ 5000 μ S/cm ☒ DO ☒

Pump Details: LIPOE hose

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: bottom - 0.5m

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	1230mL/min Comments
13:45	1	13.1	7.42	2087	-63.5	4.24	2.523	clear
13:48	1.2	12.9	7.28	2141	-52.3	2.39	2.528	
13:51	2.4	12.9	7.25	2153	-52.0	2.20	2.521	
13:54	3.1	12.9	7.22	2153	-50.2	2.44	2.521	
13:57	3.8	12.9	7.22	2151	-52.0	2.94	2.522	
14:00	4.4	13.0	7.21	2155	-52.0	3.05	2.529	
14:03	5.0	13.0	7.20	2155	-52.0	2.85	2.531	
			- Sample -					

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloudy
Temperature: 15°C

Date: 30-May
Tech: 883/DS

Well No: G42-1
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 10:50 10:47
Depth of Water (A): 0.61m
Bottom of Well (B): _____
Well Condition: need 2 pain L. but more
same surface

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 _____ pH10 _____

1413 μ S/cm _____ 5000 μ S/cm _____ DO 1.2

Pump Details: _____

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
10:51	0.46	11.9	7.51	1557	93.0	1.77	0.390	orange flecks. slight
10:54	0.61	11.6	7.45	1555	48.7	0.52	0.496	slight brown h. h. h. h.
10:57	1.3	11.6	7.48	1529	25.5	0.48	0.556	
11:01	1.7	11.6	7.50	1495	6.6	0.64	0.619	SKC
11:04	2.0	11.6	7.52	1475	-1.7	0.64	0.732	
11:08	2.7	11.7	7.54	1458	0.1	0.94	0.765	
11:11	3.1	11.5	7.54	1452	-4.1	0.84	0.801	
11:14	3.5	11.5	7.55	1445	-8.0	0.84	0.832	
— sample — stable								

Odour: ☐ Yes ☒ No If Yes, describe rainbow chunky
Sheen: ☐ Yes ☒ No If Yes, describe sheen on water in well. Not on page water.
Turbidity: Clear ☐ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Cloudy
Temperature: 15°C

Date: May 30/2022
Tech: BB/OS

Well No: GL 2-2
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 0508 11:40
Depth of Water (A): 0.508
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ✓ pH10 ✓
1413 μ S/cm ✓ 5000 μ S/cm _____ DO 2%
1413

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
11:44	0.5	12.0	7.63	1253	85.0	0.40	0.842	slight brown/grey tint
11:47	1.0	11.4	7.50	1246	86.1	0.51	1.063	- small sed.
11:50	1.5	11.6	7.50	1244	82.8	0.37	1.264	
11:53	1.9	11.7	7.53	1239	79.4	0.34	1.437	
11:56	2.3	11.4	7.53	1238	76.3	0.33	1.586	
11:59	2.6	12.1	7.54	1237	73.7	0.32	1.734	
12:02	3.0	12.6	7.54	1236	71.8	0.33	1.836	cleared up a bit
12:05	3.2	12.7	7.54	1234	71.0	0.31	1.883	
12:08	3.4	12.8	7.54	1240	69.4	0.29	1.947	
								stabilized

Odour: ☐ Yes ☒ No If Yes, describe _____
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear ☒ I ☒ II ☒ III ☒ IV ☒ V ☒ VI ☒ VII ☒ VIII ☒ IX ☒ X ☒ XI ☒ XII ☒ XIII ☒ XIV ☒ XV ☒ XVI ☒ XVII ☒ XVIII ☒ XIX ☒ XX ☒ XXI ☒ XXII ☒ XXIII ☒ XXIV ☒ XXV ☒ XXVI ☒ XXVII ☒ XXVIII ☒ XXIX ☒ XXX ☒ XXXI ☒ XXXII ☒ XXXIII ☒ XXXIV ☒ XXXV ☒ XXXVI ☒ XXXVII ☒ XXXVIII ☒ XXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV ☒ LXXV ☒ LXXVI ☒ LXXVII ☒ LXXVIII ☒ LXXIX ☒ LXXX ☒ LXXXI ☒ LXXXII ☒ LXXXIII ☒ LXXXIV ☒ LXXXV ☒ LXXXVI ☒ LXXXVII ☒ LXXXVIII ☒ LXXXIX ☒ XL ☒ XLI ☒ XLII ☒ XLIII ☒ XLIV ☒ XLV ☒ XLVI ☒ XLVII ☒ XLVIII ☒ XLIX ☒ L ☒ LI ☒ LII ☒ LIII ☒ LIV ☒ LV ☒ LVI ☒ LVII ☒ LVIII ☒ LVIX ☒ LX ☒ LXI ☒ LXII ☒ LXIII ☒ LXIV ☒ LXV ☒ LXVI ☒ LXVII ☒ LXVIII ☒ LXIX ☒ LXX ☒ LXXI ☒ LXXII ☒ LXXIII ☒ LXXIV <

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Cloudy
Temperature: 15°C

Date: May 30, 2022
Tech: BIB/RS

Well No: GL 4-1
Field Dup: ✓

MONITORING WELL INFORMATION

Time of Measurement: 1:50 / 13:50
Depth of Water (A): 1.98
Bottom of Well (B): 1.98
Well Condition: good

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 _____ pH10 _____

1413 μ S/cm _____ 5000 μ S/cm _____ DO 9.5

Pump Details: _____

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	200ml/min Comments
13:57	0.7	11.6	7.68	1518	104.3	1.41	1.326	lightly grey coloured - fine sed.
14:00	1.3	11.4	7.58	1518	104.8	0.99	1.354	
14:03	1.7	11.3	7.58	1518	102.6	0.84	1.364	
14:06	2.3	11.4	7.59	1512	99.2	0.69	1.373	- cleared up slightly 200ml/min
			sample					

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ I ☒ II ☒ III ☒ IV ☒ V ☒ VI ☒ VII ☒ VIII ☒ IX ☒ X ☒ XI ☒ XII ☒ XIII ☒ XIV ☒ XV ☒ XVI ☒ XVII ☒ XVIII ☒ XIX ☒ XX ☒ XXI ☒ XXII ☒ XXIII ☒ XXIV ☒ XXV ☒ XXVI ☒ XXVII ☒ XXVIII ☒ XXIX ☒ XXX Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L	☐ Yes	☒ No
General	☒ Plastic ☐ Glass					1	☐ Yes	☒ No
Metals	☒ Plastic ☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic ☒ Glass	1					☒ Yes	☐ No
COD, nutrient	☒ Plastic ☒ Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic ☒ Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic ☒ Glass						☐ Yes	☒ No
Sulfide	☒ Plastic ☐ Glass						☐ Yes	☒ No
VOC/BTEX	☐ Plastic ☒ Glass						☐ Yes	☒ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Cloudy / Slight rain
Temperature: 15°C

Date: May 30 / 2022
Tech: KB / DS

Well No: 664-2
Field Dup:

MONITORING WELL INFORMATION

Time of Measurement: 14:33
Depth of Water (A): 1930
Bottom of Well (B):
Well Condition:

One Well Volume:
Diameter of Well:
(B-A)*2 Litres for 51mm ϕ well
(B-A)*8 Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details:

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH10

1413 μ S/cm 5000 μ S/cm DO 1/2

WELL DEVELOPMENT

Purge Volume: Well Vol. X = Sample Intake Depth:
Average Flow Rate:

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
14:37	0.5	12.1	7.61	1824	112.6	0.80	1.91	clear
14:40	0.9	10.9	7.42	1753	110.2	0.40	1.424	
14:49	1.9	11.0	7.44	1738	105.2	0.31	1.662	here 120ml/min
14:48	2.2	11.6	7.45	1728	101.6	0.31	1.744	120ml/min change
14:51	2.6	11.6	7.46	1740	99.3	0.32	1.803	
			Sample					

Odour: ☐ Yes ☒ No If Yes, describe

Sheen: ☐ Yes ☒ No If Yes, describe

Turbidity: Clear 1/1 Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L	☐ Yes	☒ No
General	X Plastic ☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic ☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic X Glass						☐ Yes	☒ No
Sulfide	X Plastic ☐ Glass						☒ Yes	☐ No
VOC/BTEX	☐ Plastic X Glass						☒ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sunny w/ clouds Date: June 2/2022 Well No: GL5-2
 Temperature: 18°C Tech: BB/DS Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 14:30 One Well Volume: _____
 Depth of Water (A): 1.542 Diameter of Well: _____
 Bottom of Well (B): _____ (B-A)*2 _____ Litres for 51mm ϕ well
 Well Condition: wasps, new tubing in (hope) (B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

☐ Waterra Multi-meter Model: YSI Pro
☐ Hydrolift ☐ Field Bump ☒ Field Calibration
☐ Bailer pH 4 _____ pH 7 / pH10 /
☒ Peristaltic 1413 μ S/cm _____ 5000 μ S/cm / DO 2.1
☐ Bladder
 Pump Details: _____

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: Bottom + 0.6m
 Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
14:36	0.5	12.9	7.53	1860	20.4	1.86	1.548	clear
14:39	1.2	12.1	7.40	1793	20.1	0.63	1.546	
14:42	1.7	12.1	7.35	1772	18.8	0.46	1.547	
14:45	2.4	12.2	7.33	1773	17.2	0.59	1.546	
			- Sample					

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☒ I ☐ II ☐ III ☐ IV ☐ V ☐ VI ☐ VII ☐ VIII ☐ IX ☐ X ☐ XI ☐ XII ☐ XIII ☐ XIV ☐ XV ☐ XVI ☐ XVII ☐ XVIII ☐ XIX ☐ XX ☐ XXI ☐ XXII ☐ XXIII ☐ XXIV ☐ XXV ☐ XXVI ☐ XXVII ☐ XXVIII ☐ XXIX ☐ XXX Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L	☐ Yes	☒ No
General	☒ Plastic ☐ Glass					1	☐ Yes	☒ No
Metals	☒ Plastic ☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic ☒ Glass	1					☒ Yes	☐ No
COD, nutrient	☒ Plastic ☒ Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic ☒ Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic ☒ Glass						☐ Yes	☐ No
Sulfide	☒ Plastic ☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic ☒ Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun
Temperature: 17°C

Date: 7-Me-22
Tech: PS/PS

Well No: GL12-1
Field Dup: _____

Time of Measurement: 10:24
 Depth of Water (A): 2.034
 Bottom of Well (B): _____
 Well Condition: _____

One Well Volume: _____

Diameter of Well: _____

(B-A)*2 _____ Litres for 51mm ϕ well

(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details: _____

Multi-meter Model: YSI Pro

- ☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH10

1413 μ s/cm 5000 μ s/cm DO

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____

Sample Intake Depth: 60 ft - 1 m

Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear

Very Silty yellow tint

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☒ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☒ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☒ No



GROUNDWATER SAMPLING FORM GLENMORE LANDFILL

Weather: cloud, light breeze
Temperature: 14°C

Date: 2-May-2022
Tech: BD/DS

Well No: G216-1
Field Dup:

Time of Measurement: 09:22
Depth of Water (A): 0.215
Bottom of Well (B):
Well Condition: inserted new tubing to bottom

One Well Volume: _____

Diameter of Well: _____

(B-A)*2 _____ Litres for 51mm ϕ well

(B-A)*8 Litres for 102mm ϕ well

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH 10

1413 μ s/cm 5000 μ s/cm DO 7

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: bottom - 0.75m

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear [] Yes [X] No [] Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud
Temperature: 18°C

Date: 31 Aug - 22
Tech: BJS

Well No: G617-1
Field Dup: —

MONITORING WELL INFORMATION

Time of Measurement: 15:15
Depth of Water (A): 0.010
Bottom of Well (B): —
Well Condition: —

One Well Volume: —
Diameter of Well: —
(B-A)*2 — Litres for 51mm ϕ well
(B-A)*8 — Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: —

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 — pH 7 — pH10 —
1413 μ S/cm — 5000 μ S/cm — DO 7

WELL DEVELOPMENT

Purge Volume: Well Vol. X — = —
Average Flow Rate: —

Sample Intake Depth: Bottom - 1m

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
1520	1	14.2	7.45	2445	17.8	0.48	0.349	clear w/ black flecks
1523	1.7	14.5	7.39	2412	-32.8	0.33	0.459	~160ml/min
1526	2.1	14.7	7.39	2423	-51.4	0.26	0.538	~145ml/min
1529	2.4	14.6	7.40	2412	-61.9	0.24	0.603	~130ml/min
1532	2.9	14.7	7.40	2403	-71.2	0.21	0.666	
1535	3.2	14.6	7.40	2405	-74.7	0.20	0.720	
1538	3.5	14.5	7.40	2403	-78.1	0.18	0.779	clear
			— sample —					

Odour: ☒ Yes ☒ No If Yes, describe musty
Sheen: ☐ Yes ☒ No If Yes, describe —
Turbidity: Clear ☒ Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM GLENMORE LANDFILL

Weather: sun/cloud
Temperature: 22°C

Date: 31-May-22
Tech: BB

Well No: 4141620-1
Field Dup:

Time of Measurement: 13:55
Depth of Water (A): 2969
Bottom of Well (B):
Well Condition:

One Well Volume: _____

Diameter of Well: _____

(B-A)*2 _____ Litres for 51mm ϕ well

(B-A)*8 _____ Litres for 102mm ϕ well

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details: _____

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 / pH 10 /

1413 $\mu\text{s}/\text{cm}$ 5000 $\mu\text{s}/\text{cm}$ DO 7.5

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: bottom - 1m

[illegible]

Odour: ☒ Yes ☐ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear | | | | | | | | | |

~~savage~~ / savage / white line

Very Silty Dark yellow font

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun, breeze
Temperature: 15.0

Date: 6 June 2022
Tech: BO/PS

Well No: G23-1 D2
Field Dup: DUP 2

MONITORING WELL INFORMATION

Time of Measurement: 8:47
Depth of Water (A): 1.456
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 / pH10 /
1413 μ S/cm _____ 5000 μ S/cm / DO % ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: bottom - 0.75

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
8:53	0.6	11.0	7.16	2407	137.7	1.66	1.678	- Clear
8:56	1.2	10.6	7.03	2341	137.8	1.21	1.884	- 175 ml/min
8:59	1.7	10.8	7.05	2299	134.7	1.15	2.002	
9:02	2.1	10.9	7.05	2279	132.7	1.04	2.122	- 145 ml/min change
9:05	2.5	10.9	7.07	2262	131.2	0.98	2.148	
9:08	2.9	10.9	7.07	2248	129.9	0.93	2.266	
			- Sample					

Odour: ☐ Yes ☒ No If Yes, describe _____
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear 5 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Cloudy, slight rain
Temperature: 16°C

Date: May 31 / 2022
Tech: BIB / DS

Well No: GL 27-1
Field Dup: N/A

MONITORING WELL INFORMATION

Time of Measurement: 10:06
Depth of Water (A): 1.356m
Bottom of Well (B): _____
Well Condition: good condition meets code

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 / pH10 /
1413 μ S/cm / 5000 μ S/cm _____ DO 1/6 ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
1028	0.9	12.7	7.52	2463	-166.7	0.32	1.691	initial 260ml/min @ 180/min
1031	1.6	13.4	7.52	2444	-199.8	0.19	1.856	black black
1034	2.1	13.2	7.53	2419	-210.0	0.17	1.987	
1037	2.7	13.1	7.51	2400	-220.1	0.16	2.091	~175 ml/min
1040	3.3	13.2	7.52	2385	-229.9	0.17	2.203	~140ml/min
1043	3.7	13.6	7.52	2368	-234.9	0.18	2.231	
1046	4.1	13.6	7.51	2357	-239.3	0.24	2.298	black black black
								- sample -

Odour: ☐ Yes ☒ No If Yes, describe _____
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear ☒ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L	☐ Yes	☒ No
General	X Plastic ☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic ☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic X Glass						☐ Yes	☐ No
Sulfide	X Plastic ☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic X Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

(cold showers)
1500

Date: 31-May-22
Tech: 183

Well No: 6L27-3
Field Dup: -

Time of Measurement: 0948
Depth of Water (A): 2.252
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
 Diameter of Well: _____
 (B-A)*2 _____ Litres for 51mm ϕ well
 (B-A)*8 _____ Litres for 102mm ϕ well

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details:

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 pH 7 ✓ pH 10 ✓

1413 $\mu\text{S}/\text{cm}$ ☒ 5000 $\mu\text{S}/\text{cm}$ ☐ DO ☒ ☒

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: Bottom - 0.5m

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Shoen: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear ☒ I ☐ II ☐ III ☐ IV ☐ V ☐ VI ☐ VII ☐ VIII ☐ IX ☐ X ☐ XI ☐ XII ☐ XIII ☐ XIV ☐ XV ☐ XVI ☐ XVII ☐ XVIII ☐ XIX ☐ XX ☐ XXI ☐ XXII ☐ XXIII ☐ XXIV ☐ XXV ☐ XXVI ☐ XXVII ☐ XXVIII ☐ XXIX ☐ XXX Very Silty

Turbidity:	Clear		Container Size					Filtered	
Analysis	Type		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun/cloud
Temperature: 18°C

Date: 2 June - 22
Tech: CS

Well No: G7L28-1
Field Dup:

MONITORING WELL INFORMATION

Time of Measurement: 11:45am
Depth of Water (A): 5.231
Bottom of Well (B):
Well Condition: good

One Well Volume:
Diameter of Well:
(B-A)*2 Litres for 51mm ϕ well
(B-A)*8 Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH10

1413 μ S/cm 5000 μ S/cm DO -3%

Pump Details:

WELL DEVELOPMENT

Purge Volume: Well Vol. X =
Average Flow Rate:

Sample Intake Depth: bottom - 0.75

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
11:48	0.7	12.6	7.04	3945	11.9	2.38	5.345	clear 300mL/min
11:51	1.35	12.5	7.02	3931	15.1	1.67	5.351	
11:54	1.9	12.4	7.02	3905	16.9	1.81	5.351	
11:57	2.6	12.5	7.04	3894	16.8	1.67	5.351	
	- Sample -							

Odour: ☐ Yes ☒ No If Yes, describe

Sheen: ☐ Yes ☒ No If Yes, describe

Turbidity: Clear ☒ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☐ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☒ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sunny
Temperature: 17°C

Date: June 2 / 2022
Tech: DS/RSB

Well No: GL 28-2
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 11:57
Depth of Water (A): 4.732m
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ✓ pH10 ✓
1413 μ S/cm _____ 5000 μ S/cm ✓ DO 2.1

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
12:00	0.5	13.7	7.41	5297	129.5	0.57	4.796	
12:03	1.0	12.6	6.93	5309	131.2	0.37	4.794	
12:06	1.6	12.6	6.94	5312	128.1	0.36	4.807	
12:09	2.1	12.4	6.91	5307	126.2	0.40	4.806	

Odour: ☐ Yes ☒ No If Yes, describe _____
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear ||||| Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☒ No	
Sulfide	X Plastic ☐ Glass						☒ Yes ☒ No	
VOC/BTEX	☐ Plastic X Glass						☒ Yes ☒ No	



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Temperature:

cloud, light breeze $\Rightarrow$ light rain
18°C Date: _____
Tech: _____

Tech:

2-June-2L

6628-3

Field Dup:

Time of Measurement: 12:17pm
 Depth of Water (A): 4.691
 Bottom of Well (B): _____
 Well Condition: _____

One Well Volume: _____

Diameter of Well: _____

(B-A)*2 Litres for 51mm ϕ well

(B-A)*8 Litres for 102mm ϕ well

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH10

1413 μ s/cm 5000 μ s/cm DO 7.5

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: *Bottom - 0.6 m*

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear | I I I I I I I I I I I I I I I I I I I I) Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

* recharge slows better @ 5.1 m than

GROUNDWATER SAMPLING FORM GLENMORE LANDFILL

Weather: Sunny
Temperature: 18°C

Date: June 6 / 2022
Tech: DS / BB

Well No: GL 29-1
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 10:20
Depth of Water (A): 4.186m
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 / pH10 /

1413 μ S/cm _____ 5000 μ S/cm / DO 8.1

Pump Details: _____

1/4" hose inside
1/2" Waterra to bottom. Sub pump stuck @ 4.5m. Volume of 1/2" Waterra is ~ 6L.

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

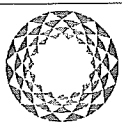
Sample Intake/Depth: _____
Pre-purge volume of Waterra $\rightarrow$ low flow.

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
10:27	1.0						4.758	purging out all of the
10:31	2.0						5.253	water $\rightarrow$ sample
10:35	3.0						5.826	after recharged
10:39	4.0						6.217	-yellow tint
10:43	5.0						6.683	
10:47	6.0						7.114	
10:51	7.0						~~7.518~~ 7.518	
10:55	8.0						7.913	-stopped

Odour: ☒ Yes ☐ No If Yes, describe rotten eggs

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ I ☐ II ☐ III ☐ IV ☐ V ☐ VI ☐ VII ☐ VIII ☐ IX ☐ X ☐ XI ☐ XII ☐ XIII ☐ XIV ☐ XV ☐ XVI ☐ XVII ☐ XVIII ☐ XIX ☐ XX ☐ XXI ☐ XXII ☐ XXIII ☐ XXIV ☐ XXV ☐ XXVI ☐ XXVII ☐ XXVIII ☐ XXIX ☐ XXX ☐ XXXI ☐ XXXII ☐ XXXIII ☐ XXXIV ☐ XXXV ☐ XXXVI ☐ XXXVII ☐ XXXVIII ☐ XXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ 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☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI



City of
Kelowna

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sunny
Temperature: 26°C

Date: June 6/2022
Tech: DB/DS

Well No: GL 29-1
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 12:29
Depth of Water (A): 5.779
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder
- Pump Details: _____

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ✓ pH10 ✓
1413 μ S/cm _____ 5000 μ S/cm ✓ DO % ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = low flow post recovery
Average Flow Rate: _____ Sample Intake Depth: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
12:35	0.5	16.9	7.47	1749	0.8	1.02	5.869	returned after recovery
12:38	0.9	16.2	7.47	1701	-63.3	0.31	5.969	
12:41	1.125	16.4	7.48	1689	-32.1	0.19	6.095	-100 ml/min
12:44	1.475	16.4	7.49	1684	-16.1	0.14	6.172	
12:47	1.7	16.8	7.50	1682	-11.8	0.14	6.232	
12:50	1.9	16.9	7.43	1684	-9.4	0.12	6.320	

Odour: ☒ Yes ☐ No If Yes, describe less strong egg smell
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear ☒ I ☐ II ☐ III ☐ IV ☐ V ☐ VI ☐ VII ☐ VIII ☐ IX ☐ X ☐ XI ☐ XII ☐ XIII ☐ XIV ☐ XV ☐ XVI ☐ XVII ☐ XVIII ☐ XIX ☐ XX ☐ XXI ☐ XXII ☐ XXIII ☐ XXIV ☐ XXV ☐ XXVI ☐ XXVII ☐ XXVIII ☐ XXIX ☐ XXX ☐ XXXI ☐ XXXII ☐ XXXIII ☐ XXXIV ☐ XXXV ☐ XXXVI ☐ XXXVII ☐ XXXVIII ☐ XXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ 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☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ XLIII ☐ XLIV ☐ XLV ☐ XLVI ☐ XLVII ☐ XLVIII ☐ XLIX ☐ L ☐ LI ☐ LII ☐ LIII ☐ LIV ☐ LV ☐ LVI ☐ LVII ☐ LVIII ☐ LIX ☐ LX ☐ LXI ☐ LXII ☐ LXIII ☐ LXIV ☐ LXV ☐ LXVI ☐ LXVII ☐ LXVIII ☐ LXIX ☐ LXX ☐ LXXI ☐ LXXII ☐ LXXIII ☐ LXXIV ☐ LXXV ☐ LXXVI ☐ LXXVII ☐ LXXVIII ☐ LXXIX ☐ LXXX ☐ LXXXI ☐ LXXXII ☐ LXXXIII ☐ LXXXIV ☐ LXXXV ☐ LXXXVI ☐ LXXXVII ☐ LXXXVIII ☐ LXXXIX ☐ XL ☐ XLI ☐ XLII ☐ 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GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun, windy
Temperature: ~18°C

Date: 6 June 2022
Tech: BSB

Well No: 6L29-2
Field Dup: -

MONITORING WELL INFORMATION

Time of Measurement: 10:32
Depth of Water (A): 7.315
Bottom of Well (B): -
Well Condition: OK

One Well Volume: -
Diameter of Well: -
(B-A)*2 - Litres for 51mm ϕ well
(B-A)*8 - Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder
Pump Details: -

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 - pH 7 - pH10 -
1413 μ S/cm - 5000 μ S/cm - DO 7.2

WELL DEVELOPMENT

Purge Volume: Well Vol. X - = -
Average Flow Rate: -

Sample Intake Depth: Bottom - 0.25

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
10:34	0.5	14.5	7.50	6224	134.6	2.00	3.406	140mL
10:37	1.0	13.9	7.25	6402	134.0	0.87	3.615	clear, NS/NO. ~18m
10:40	1.35	13.9	7.24	6473	131.5	0.72	3.766	~110mL
10:43	1.6	14.3	7.23	6530	129.3	0.67	3.918	~100mL
10:46	1.9	14.5	7.23	6584	127.0	0.61	4.075	~100mL
10:49	2.2	14.3	7.23	6626	125.7	0.59	4.166	
10:52	2.5	14.4	7.23	6628	124.1	0.58	4.291	
10:55	2.8	14.5	7.23	6655	122.5	0.55	4.472	
				sample -				

Odour: ☐ Yes ☒ No If Yes, describe -

Sheen: ☐ Yes ☒ No If Yes, describe -

Turbidity: Clear ☒ I ☐ II ☐ III ☐ IV ☐ V ☐ VI ☐ VII ☐ VIII ☐ IX ☐ X ☐ XI ☐ XII ☐ XIII ☐ XIV ☐ XV ☐ XVI ☐ XVII ☐ XVIII ☐ XIX ☐ XX ☐ XXI ☐ XXII ☐ XXIII ☐ XXIV ☐ XXV ☐ XXVI ☐ XXVII ☐ XXVIII ☐ XXIX ☐ XXX Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☐ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☐ No	

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: partly cloudy
Temperature: 17°C

Date: May 31 / 2022
Tech: DS

Well No: GL35-3
Field Dup: N/A

MONITORING WELL INFORMATION

Time of Measurement: 13:50
Depth of Water (A): 0.617 m
Bottom of Well (B):
Well Condition: good

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details:

Multi-meter Model: YSI Pro

- ☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 _____ pH10 _____
1413 μ s/cm _____ 5000 μ s/cm _____ DO _____

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☒ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☒ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☒ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloudy
Temperature: 60°

Date: 31-May-22
Tech: 183ADS

Well No: 6139
Field Dup: 4 Dup 1

MONITORING WELL INFORMATION

Time of Measurement: 11:39
 Depth of Water (A): 3.408
 Bottom of Well (B): _____
 Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details:

Multi-meter Model: YSI Pro

- ☐
- Field Bump
- ☒
- Field Calibration

pH 4 pH 7 pH10

1413 μ s/cm 5000 μ s/cm DO 7.2

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____
Average Flow Rate: _____

Sample Intake Depth: Dillon - 0.5

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear (1) | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☒ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Well No: GL 39-2
Field Dup: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
 pH 4 pH 7 pH10
 1413us/cm 5000us/cm DO

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Turbidity: Clear (1) | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: rain
Temperature: 15°C

Date: 17-June-2022
Tech: 1803

Well No: 6639-3
Field Dup: _____

Time of Measurement: 11:10
 Depth of Water (A): 3.324
 Bottom of Well (B): 3.820
 Well Condition: OK

One Well Volume: 76
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Bladder

Multi-meter Model: YSI Pro

☐ Field Bump ☐ Field Calibration

pH 4 pH 7 pH10

1413 μ s/cm 5000 μ s/cm DO

Pump Details: insufficient volume for sample. MS

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☐ No If Yes, describe

Sheen: ☐ Yes ☐ No If Yes, describe

Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☐ No
Metals	X Plastic	☐ Glass		1				☐ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☐ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

City of Kelowna

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather:
Temperature:

Jun 18c

Date:

Tech:

Date: 15-May-22
Tech: 00

Well No:

Field Dup:

Well No: GL41-1
Field Dup:

MONITORING WELL INFORMATION

Time of Measurement:

Depth of Water (A):

Bottom of Well (B):

Well Condition:

One Well Volume:

Diameter of Well:

(B-A)*2 Litres for 51mm ϕ well

(B-A)*8 Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer

Multi-meter Model: YSI Pro

- ☐
- Field Bump
- ☒
- Field Calibration

pH 4 pH 7 pH 10

1413 μ s/cm 5000 μ s/cm ✓ DO ✓

 Bladder

Pump Details:

WELL DEVELOPMENT

Purge Volume: Well Vol. X

Sample Intake Depth:

Average Flow Rate:

[illegible]

Odour:

- ☐ Yes ☒ No

If Yes, describe

Sheen:

- ☐ Yes ☒ No

If Yes, describe

Turbidity:

Clear

Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Date: 12/23/2009 Well No: Q41-2
Tech: RS Field Dup: ~~RS~~

Time of Measurement: 12:08 One Well Volume: _____
 Depth of Water (A): 2.79 Diameter of Well: _____
 Bottom of Well (B): _____ (B-A)*2 _____ Litres for 51mm ϕ well
 Well Condition: _____ (B-A)*8 _____ Litres for 102mm ϕ well

☐ Waterra
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☒ Bladder

Pump Details: dedicated PE

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
 pH 4 pH 7 pH10
 1413 μ s/cm 5000 μ s/cm DO

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No



GLENMORE LANDFILL

in/cloud 2.2a

Date: June 15
Tech: 1385

Well No: GL 41-3
Field Dup: (Dup 3) Dup 3

MONITORING WELL INFORMATION

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 ✓ pH10 ✓
 1413 μ s/cm _____ 5000 μ s/cm ✓ DO 7. ✓

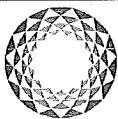
WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	☒ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

**GROUNDWATER SAMPLING FORM**
GLENMORE LANDFILLWeather: sun
Temperature: 22°CDate: 7 June-22
Tech: AKP/JSWell No: GL42-1
Field Dup: _____**MONITORING WELL INFORMATION**Time of Measurement: 12:50
Depth of Water (A): 10.550
Bottom of Well (B): _____
Well Condition: _____One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well**EQUIPMENT LIST**

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☒ Bladder
Pump Details: _____

Multi-meter Model: _____ YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 _____ pH10 _____

1413 μ S/cm _____ 5000 μ S/cm _____ DO 7.2**WELL DEVELOPMENT**Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
13:08	0.5	14.3	8.36	5050	84.8	9.02	10.633	200ml/min
13:11	1.3	12.5	7.36	4863	96.1	1.00	10.943	
13:14	1.85	12.7	7.21	4702	76.9	0.27	11.131	
13:17	2.5	12.5	7.18	4736	66.1	0.27	11.372	
13:20	3.0	12.5	7.17	4758	57.6	0.28	11.585	
13:23	3.5	12.5	7.17	4773	48.0	0.20	11.792	
13:26	4.2	14.3	7.17	4664	41.5	0.14	11.760	-60ml/min
13:29	4.5	15.0	7.17	4799	31.3	0.16	11.721	-150ml/min
13:32	4.6	13.5	7.18	4812	23.3	0.21	11.741	
13:35	4.9	13.4	7.18	4841	17.2	0.17	11.801	
13:38	5.3	13.4	7.18	4865	8.3	0.15	11.861	

Odour: ☐ Yes ☒ No If Yes, describe _____Sheen: ☐ Yes ☒ No If Yes, describe _____Turbidity: Clear 1 Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☒ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☒ Yes ☐ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☒ No	

Weather: Sunny
Temperature: 23°C

Date: June 7/2022
Tech: BB/DS

Well No: 642-1
Field Dup:

Time of Measurement: _____
 Depth of Water (A): _____
 Bottom of Well (B): _____
 Well Condition: _____

One Well Volume: _____

Diameter of Well: _____

(B-A)*2 _____ Litres for 51mm ϕ well

(B-A)*8 _____ Litres for 102mm ϕ well

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☐ Bladder

Pump Details:

Multi-meter Model: YSI Pro

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 _____ pH 10

1413 $\mu\text{s}/\text{cm}$ 5000 $\mu\text{s}/\text{cm}$ DO 2.3

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☒ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☒ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☒ Yes	☐ No



GLENMORE LANDFILL

Well No: GL42-2
Field Dup: —

One Well Volume: _____
 Diameter of Well: _____
 (B-A)*2 _____ Litres for 51mm ϕ well
 (B-A)*8 _____ Litres for 102mm ϕ well

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 ✓ pH10 ✓
 1413µs/cm _____ 5000µs/cm ✓ DO ✓

Odour: ☐ Yes ☒ No If Yes, describe _____
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: rain
Temperature: 15°C

Date: 17-May
Tech: B83

Well No: 642-3
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 11:00
Depth of Water (A): 0.945
Bottom of Well (B): 0.490
Well Condition: insufficient vol

One Well Volume: $0.55 \times 2 = 1.1 \text{ L}$
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
 - ☐ Hydrolift
 - ☐ Bailer
 - ☐ Peristaltic
 - ☐ Bladder
- Pump Details

Multi-meter Model: YSI Pro

- ☐
- Field Bump
- ☐
- Field Calibration

pH 4 pH 7 pH10

1413 μ s/cm 5000 μ s/cm DO .

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☐ No If Yes, describe _____

Sheen: ☐ Yes ☐ No If Yes, describe _____

Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☐ No
Metals	X Plastic	☐ Glass		1				☐ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☐ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No



GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun, wind
Temperature: 18°C

Date: 6-June-2022
Tech: BB/DS

Well No: 1661 091364 03
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 13:49
Depth of Water (A): ~~3.791~~ 3.791
Bottom of Well (B):
Well Condition:

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer
- ☒ Peristaltic
- ☒ Bladder
- Pump Details

Multi-meter Model: YSI Pro

- ☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 _____ pH10 _____
1413 μ s/cm 5000 μ s/cm DO γ ✓

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: _____
Average Flow Rate: _____

[illegible]

Odour: ☐ Yes ☒ No If Yes, describe _____

Shoen: ☐ Yes ☒ No If Yes, describe

Turbidity: Clear (I) I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, nutrient	X Plastic	X Glass		1				☐ Yes	☒ No
Organic C	☐ Plastic	X Glass	2					☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass						☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass						☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass						☐ Yes	☐ No

GROUNDWATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sunny
Temperature: 17°C

Date: June 2 / 2022
Tech: PS / BS

Well No: 09BH06-D
Field Dup: _____

MONITORING WELL INFORMATION

Time of Measurement: 11:00
Depth of Water (A): 0 - artesian
Bottom of Well (B): _____
Well Condition: _____

One Well Volume: _____
Diameter of Well: _____
(B-A)*2 _____ Litres for 51mm ϕ well
(B-A)*8 _____ Litres for 102mm ϕ well

EQUIPMENT LIST

- ☐ Waterra
☐ Hydrolift
☐ Bailer
☒ Peristaltic
☐ Bladder

Multi-meter Model: YSI Pro
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 / pH10 /
1413 μ S/cm _____ 5000 μ S/cm / DO 2.0

Pump Details: _____

WELL DEVELOPMENT

Purge Volume: Well Vol. X _____ = _____ Sample Intake Depth: bottom - 1m
Average Flow Rate: _____

Time	Vol. Removed (L)	Temp (°C)	pH (Units)	Conductivity (uS/cm)	Redox (mV)	Dissolved O ₂ (mg/L)	Water Level (m)	Comments
11:02	1.0	11.7	7.68	1167	85.7	0.42	0	artesian - flowing out
11:05	1.6	11.7	7.58	1157	86.2	0.30	0	clear water
11:08	2.4	11.5	7.58	1144	81.4	0.25	0	
			- Sample					

Odour: ☐ Yes ☒ No If Yes, describe _____
Sheen: ☐ Yes ☒ No If Yes, describe _____
Turbidity: Clear ☒ ☐ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass					1	☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, nutrient	X Plastic X Glass		1				☐ Yes ☒ No	
Organic C	☐ Plastic X Glass	2					☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass						☒ Yes ☐ No	
Sulfide	X Plastic ☐ Glass						☐ Yes ☒ No	
VOC/BTEX	☐ Plastic X Glass						☐ Yes ☒ No	

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud
Temperature: 10°C

Date: 22-Mar-22
Tech: BSJ

Pond: Slough

POND INFORMATION

Time of Measurement: 16:20
Pond Elevation: 0m

Location of Pond: _____
Location of Elevation: gauge

EQUIPMENT LIST

- ☒ Swing Sampler
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ✓ pH10 _____
1413µs/cm _____ 5000µs/cm ✓
Others DO?

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
15:47	9.2	8.68	2695	1755	88.6	22.49	strong brown colour to water. Gum rail H ₂ S AM

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear 10 Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☐ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☐ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

met-D

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Cloudy recent rain
Temperature: 10°C

Date: 22-Mar-22
Tech: RS

Pond: NE Pond

POND INFORMATION

Time of Measurement: _____

Location of Pond: _____

Pond Elevation: Top of 1st bench

Location of Elevation: _____

EQUIPMENT LIST

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 _____ pH10 ✓
 1413µs/cm _____ 5000µs/cm ✓ +00;
 Others _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
<u>13:10</u>	<u>8.0</u>	<u>8.49</u>	<u>2640</u>	<u>246.0</u>	<u>96.1</u>	<u>17.51</u>	

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	☒ Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	☒ Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	☒ Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	☒ Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	☒ Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	☒ Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	☒ Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	☒ Glass	2					☐ Yes	☒ No	Hydrochloric

clear. some small invertebrates. some algae + weeds in water.
 recent rain. Pond very full. Sky very slight overcast.



Weather: clear
Temperature: ~ 60°

Date: 03-Mar-22
Tech: 183

Pond: 2 Bubaia slough

Time of Measurement: 10:12
Pond Elevation: _____

Location of Pond: _____
Location of Elevation: Pellack

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 ✓ pH10 ✓
 1413µs/cm _____ 5000µs/cm -
 Others Do's

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
10:17	6.1	8.65	1422	929.5	95.7	17.73	clear, minor organic debris

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20

Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

+ March-D

recent rain 22-Mar Am



Weather: cloud
Temperature: 70c

Date: 23-Mar-2022
Tech: BB

Pond: Slough #2

Time of Measurement: 10:40
Pond Elevation: high

Location of Pond: _____

Location of Elevation: Path 101

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other

☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH 10 pH 12

1413 μ s/cm 5000 μ s/cm

Others **DD %**

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
10:42	6.5	8.77	3548	2307.5	80.4	18.88	small invertebrates in sample. clear

Odour: ☐ Yes ☒ No If Yes, describe _____

Shien: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☒ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

new $\sim$ *

நிதி

recent min 22-mar-22 Am

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun/cloud
Temperature: 10°C

Date: 23-March-22 Pond: ~~Shanley~~
Tech: BB Little Robot

POND INFORMATION

Time of Measurement: 12:30
Pond Elevation: - high

Location of Pond: Lake
Location of Elevation: E side

EQUIPMENT LIST

- ☒ Swing Sampler
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 _____ pH10 _____
1413µs/cm _____ 5000µs/cm _____
Others DO2

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
12:34	10.7	8.90	4227.0	2749	79.9	26.89	light green find.

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear IIII D IIII IIII IIII IIII IIII IIII IIII IIII IIII Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	☒ Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	☒ Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	☒ Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	☒ Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	☒ Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	☒ Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	☒ Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	☒ Glass	2					☐ Yes	☒ No	Hydrochloric

more-D

Nitric

rain-bum yesterday Am

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: 140C sun/cloud
Temperature: _____

Date: 23-Mar-22
Tech: RS

Pond: Robert Lake

POND INFORMATION

Time of Measurement: 14:30
Pond Elevation: 51cm

Location of Pond: _____
Location of Elevation: staff gauge e post

EQUIPMENT LIST

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ✓ pH10 ✓
1413µs/cm _____ 5000µs/cm ✓
Others DO?

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
14:33	12.1	9.21	8300	5395.0	64.8	22.59	strong green tank

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ||||| 1 ||||| Very Silty

Analysis	Type	Container Size					Filtered		Preservatives
		40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic ☐ Glass					1	☐ Yes ☒ No		Raw
Metals	X Plastic ☐ Glass		1				☐ Yes ☒ No		Nitric Acid
Mercury	☐ Plastic X Glass	1					☐ Yes ☒ No		Hydrochloric
Metals - D	X Plastic ☐ Glass		1				☒ Yes ☐ No		Nitric Acid
COD, etc	☐ Plastic X Glass			1			☐ Yes ☒ No		Sulfuric Acid
Coliforms	X Plastic ☐ Glass			1			☐ Yes ☒ No		
DOC	☐ Plastic X Glass	2					☒ Yes ☐ No		Hydrochloric
TOC	☐ Plastic X Glass	2					☐ Yes ☒ No		Hydrochloric

note -
obax of manure in area.

nihil



Weather: Sun
Temperature: 23°C

Date: 21-June-2022
Tech: 183

Pond: ~~Staghorn #2~~ Staghorn #2

Time of Measurement: 10:56
Pond Elevation: _____

Location of Pond: _____
Location of Elevation: _____

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 / pH10 /
 1413 μ s/cm _____ 5000 μ s/cm /
 Others Do ?

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
10:56	19.2	8.82	5057	3289.0	69.4	7.93	

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20

Very Silty slight green tint, small inverts.

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☒ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☒ Yes	☒ No	Hydrochloric

mer-D



SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun
Temperature: 20°C

Date: 21-Sne-2024
Tech: 15/13

Pond: Bredin Pond
Run 1

Time of Measurement: 01 0950
Pond Elevation: _____

Location of Pond: _____
Location of Elevation: _____

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 pH10
 1413 μ s/cm _____ 5000 μ s/cm
 Others 100%

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
0952	19.4	8.62	1888.0	1228.5	87.2	15.68	~~lot of suspended algae.~~

lots of suspended algae.

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☒ 1 ☒ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20

Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

pre- ∇



Weather: Sun
Temperature: 25°C

Date: 21-Jun-2022
Tech: 185/125

Pond: Robert Lake

Time of Measurement: _____
Pond Elevation: _____

Location of Pond: _____
Location of Elevation: _____

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☐ Field Calibration _____
 pH 4 _____ pH 7 _____ pH10 _____
 1413µs/cm _____ 5000µs/cm _____
 Others DO 72 _____

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
12:31	21.0	8.98	9824.0	~~6428~~ 6435	43.9	21.51	strong green frnt. lake is eutrophic lots of invertebrates.

[illegible]

Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☒ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

next - (7)

242



Weather: sun
Temperature: 22°C

Date: 21-Mar
Tech: RB/PS

Pond: Bobra Slough

Time of Measurement: _____
Pond Elevation: _____

Location of Pond: _____
Location of Elevation: _____

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☐ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 _____ pH10 _____
 1413 μ s/cm _____ 5000 μ s/cm _____
 Others DO 7 _____

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
10:15	20.0	8.53	3013	1963.0	90.0	12.67	Clear. Saw small invertebrates.

Odour: ☐ Yes ☐ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20

Turbidity: Clear Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☐ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

her-15

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: sun + light cloud
 Temperature: ~16°C

Date: 21-June-22
 Tech: (63/12)

Pond: NE Pond

POND INFORMATION

Time of Measurement: 8:54
 Pond Elevation: high

Location of Pond: _____
 Location of Elevation: _____

EQUIPMENT LIST

- ☒ Swing Sampler
☐ Hydrolift
☐ Bailer
☐ Peristaltic
☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 ☒ pH10 ☒
 1413µs/cm _____ 5000µs/cm ☒
 Others DO %

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
8:54	19.6	8.72	2833	1839.5	90.6	9.98	Clear. some small invertebrates (shrimp) slight green tint.

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ Very Silty

Analysis	Type	Container Size					Filtered		Preservatives
		40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic ☐ Glass					1	☐ Yes ☒ No		Raw
Metals	X Plastic ☐ Glass		1				☐ Yes ☒ No		Nitric Acid
Mercury	☐ Plastic X Glass	1					☐ Yes ☒ No		Hydrochloric
Metals - D	X Plastic ☐ Glass		1				☒ Yes ☐ No		Nitric Acid
COD, etc	☐ Plastic X Glass			1			☐ Yes ☒ No		Sulfuric Acid
Coliforms	X Plastic ☐ Glass			1			☐ Yes ☒ No		
DOC	☐ Plastic X Glass	2					☒ Yes ☐ No		Hydrochloric
TOC	☐ Plastic X Glass	2					☐ Yes ☒ No		Hydrochloric



SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: partly cloudy
Temperature: 20°C

Date: 21-Sep-22
Tech: RFID

Pond: Tuft Pond

Time of Measurement: 1:40
Pond Elevation: 23

Location of Pond: _____
Location of Elevation: shell gauge

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 _____ pH10 _____
 1413µs/cm _____ 5000µs/cm _____
 Others DO %

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
13:22	20.6	8.71	2597	1690.0	52.6	20.73	lots of algae. some invertebrate

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear I I I (7) I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☐ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

West-7

120



Weather: 20°C
Temperature: SUNNY

Date: June 21/2022
Tech: BB/PS

Pond: Little Round Lake

Time of Measurement: 11:55
Pond Elevation: _____

Location of Pond: _____
Location of Elevation: _____

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 / pH10 /
 1413µs/cm _____ 5000µs/cm /
 Others DO%

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
11:57	23.2	8.94	~~9800~~	2970.5	62.2	15.75	some algae, plants. slight green tan

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 Very Silty

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

med - 17



SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: cloudy / sun
Temperature: 24°C

Date: June 21 / 2022
Tech:

Pond: Slough

POND INFORMATION

Time of Measurement: 13:47

Location of Pond: _____

Pond Elevation: _____

Location of Elevation: _____

EQUIPMENT LIST

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Bailer
- ☐ Peristaltic
- ☐ Submersible

Multi-meter Model: ☒ YSI Pro ☐ Other _____

- ☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH 10

1413 $\mu\text{s}/\text{cm}$ 5000 $\mu\text{s}/\text{cm}$

Others 00% ✓

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (mS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
13:47	22.3	8.69	617.1	4010.5	63.6	11.39	brown, colour - pond is opaque -

Odour: ☒ Yes ☐ No If Yes, describe Slight Smell

Seen: ☐ Yes ☒ No If Yes, describe _____

[illegible]

Analysis	Type		Container Size					Filtered		Preservatives
			40 mL	125 mL	250 mL	500 mL	1 L			
General	X Plastic	☐ Glass					1	☐ Yes	☒ No	Raw
Metals	X Plastic	☐ Glass		1				☐ Yes	☒ No	Nitric Acid
Mercury	☐ Plastic	X Glass	1					☐ Yes	☒ No	Hydrochloric
Metals - D	X Plastic	☐ Glass		1				☒ Yes	☐ No	Nitric Acid
COD, etc	☐ Plastic	X Glass			1			☐ Yes	☒ No	Sulfuric Acid
Coliforms	X Plastic	☐ Glass			1			☐ Yes	☒ No	
DOC	☐ Plastic	X Glass	2					☒ Yes	☐ No	Hydrochloric
TOC	☐ Plastic	X Glass	2					☐ Yes	☒ No	Hydrochloric

merC-D

X

1

X



Clady / smoke
18²

Sept 12/2022
B3

Robert Wake

Time of Measurement: 13:30
Pond Elevation: 20cm on bridge

Location of Sample: west side of parking lot
Location of Elevation: shaft pipe

☒ Swing Sampler
☐ Hydrolift
☐ Submersible
☐ Peristaltic
 Others

Multi-meter Model: ☒ YSI Pro ☐ Other _____

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 _____ pH10 _____
1413 μ s/cm 5000 μ s/cm DO _____

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
13:30	17.5	9.18	12400	8060	79.1	8.73	green/brown tint. lake is

reced brown int. lake is
nearly opaque. Looks like algae

Odour: ☐ Yes ☒ No If Yes, describe

Seen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1		1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: _____



18°C Cloudy
18°C

Sept 12/2022
13.3

Sloozh #2

Time of Measurement: 13:00
Pond Elevation: _____

Location of Sample: East side Road pull out
Location of Elevation: _____

- ☒ Swing Sampler
- ☐ Hydrolift
- ☐ Submersible
- ☐ Peristaltic
- Others

Multi-meter Model: ☒ YSI Pro ☐ Other☐ Field Bump ☒ Field Calibration

pH 4 pH 7 pH 10

1413 μ s/cm 5000 μ s/cm DO

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
13:00	19.1	8.84	5089	3828.5	56.0	2.86	very small invertebrates.

Odour: ☐ Yes ☒ No If Yes, describe _____

Shoen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1		1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes:



Weather: drizzle, cloud
Temperature: 19°C

Date: 12-sept-72
Tech: _____

Pond: Bona Clough

Time of Measurement: 12:30 pm
Pond Elevation: _____

Location of Sample: w side
Location of Elevation: _____

☒ Swing Sampler
☐ Hydrolift :
☐ Submersible
☐ Peristaltic
 Others _____

Multi-meter Model: ☒ YSI Pro ☐ Other _____

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 _____ pH 10 _____

1413 μ s/cm 5000 μ s/cm DO

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
12:30 pm	18.1	8.55	3371.0	2190.5	108.9	6.73	small ver. (small) invertebrates.

Odour: ☐ Yes ☒ No If Yes, describe _____

Shoen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear 11 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			☒		1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: _____



cloudy / rain
18°C

Sept 12/2022
BB

NE Pearl

Time of Measurement: 9:50 am 11:45 am
Pond Elevation: _____

Location of Sample: NE Pond north shore
Location of Elevation: _____

☒ Swing Sampler
☐ Hydrolift
☐ Submersible
☐ Peristaltic
 Others

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 7.2 pH10 10.2
 1413 μ S/cm 5000 μ S/cm 5000 DO _____

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
~~11:00~~	16.9	9.53	2915	1891.5	69.4	17.65	

~~11:45am~~

[illegible]

Turbidity: Clear I I I (I) I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1		1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: very weedy/algae. lots of shrimp/invertebrates

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: drizzle, smoke, cloud
Temperature: 15°C

Date: 12-sept-22
Tech: BO/AG

Pond: Bredon Pond

POND INFORMATION

Time of Measurement: 0902
Pond Elevation: _____

Location of Sample: duck
Location of Elevation: duck sensor

EQUIPMENT LIST

☒ Swing Sampler

☐ Hydrolift

☐ Submersible

☐ Peristaltic

Others _____

Multi-meter Model: ☒ YSI Pro ☐ Other _____

☐ Field Bump ☐ Field Calibration

pH 4 _____ pH 7 / pH10 /

1413µs/cm _____ 5000µs/cm _____ DO /

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
9:00 AM	18.7	8.83	2044.0	1326.0	108.5	4.49	

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	☒ Plastic	☐ Glass			1		1	☐ Yes	☒ No
Metals-Tot	☒ Plastic	☐ Glass		1				☐ Yes	☒ No
Mercury-Tot	☐ Plastic	☒ Glass	1					☐ Yes	☒ No
Metals-Dis	☒ Plastic	☐ Glass		1				☒ Yes	☐ No
Organic C	☐ Plastic	☒ Glass	2					☐ Yes	☒ No
Coliforms	☒ Plastic	☐ Glass			1			☐ Yes	☒ No
COD/Nutrients	☒ Plastic	☐ Glass			1			☐ Yes	☒ No
DOC	☐ Plastic	☒ Glass	2					☒ Yes	☐ No
Mercury-Dis	☐ Plastic	☒ Glass	1					☒ Yes	☐ No

Notes: lots of small invertebrates / shrimp



Pond: Little Robert Lake

Location of Sample: East Shore
Location of Elevation: _____

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 _____ pH10 _____
 1413µs/cm _____ 5000µs/cm _____ DO _____

Notes: _____

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun Date: 9-Sep-2027 Pond: Slough
 Temperature: 23°C Tech: ROS

POND INFORMATION

Time of Measurement: Below gauge 14:30 Location of Sample: sluff gauge
 Pond Elevation: below gauge Location of Elevation: _____

EQUIPMENT LIST

☒ Swing Sampler Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Hydrolift ☐ Field Bump ☒ Field Calibration
☐ Submersible pH 4 _____ pH 7 _____ pH10 _____
☐ Peristaltic 1413µS/cm _____ 5000µS/cm _____ DO _____
 Others _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
14:15	20.3	9.31	10445	6772.5	98.6	8.91	brown/green colour.

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☐ Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1		1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: very very silty brown/green



1221

Location of Sample: Stall house / evulsion
Location of Elevation: 87' 11"

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 _____ pH10 _____
 1413us/cm _____ 5000us/cm _____ DO _____

Notes: green tint in pond.

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: SUN
Temperature: 10.12°C

Date: 19-OCT-22
Tech: RJS

Pond: Tut Pond
DUP 1

POND INFORMATION

Time of Measurement: 10:45
Pond Elevation: _____

Location of Sample: staff gauge
Location of Elevation: staff gauge

EQUIPMENT LIST

☒ Swing Sampler

☐ Hydrolift

☐ Submersible

☐ Peristaltic

Others _____

Multi-meter Model: ☒ YSI Pro ☐ Other _____

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 ☒ pH10 ☒

1413µs/cm _____ 5000µs/cm ☒ DO ☒

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox* (mV)	Dissolved O ₂ (mg/L)	Comments
10:45	13.1	8.48	3392.0	2203.5	-114.4	10.78	

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	☒ Plastic	☐ Glass					1	☐ Yes	☒ No
Metals-Tot	☒ Plastic	☐ Glass		1				☐ Yes	☒ No
Mercury-Tot	☐ Plastic	☒ Glass	1					☐ Yes	☒ No
Metals-Dis	☒ Plastic	☐ Glass		1				☒ Yes	☐ No
Organic C	☐ Plastic	☒ Glass	2					☐ Yes	☒ No
Coliforms	☒ Plastic	☐ Glass			1			☐ Yes	☒ No
COD/Nutrients	☒ Plastic	☐ Glass			1			☐ Yes	☒ No
DOC	☐ Plastic	☒ Glass	2					☒ Yes	☐ No
Mercury-Dis	☐ Plastic	☒ Glass	1					☒ Yes	☐ No

Notes: lots of small invertebrates. Not shrimp more like

* suspect problem with redox sensor



Pond: Slough

Location of Sample: staff gauge
Location of Elevation: "

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 ☒ pH10 ☒
 1413us/cm 5000us/cm ☒ DO ☒

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox* (mV)	Dissolved O ₂ (mg/L)	Comments
11:40	11.7	9.40	11216.0	7293.0	-162.9	15.86	heavy green tint/color. no invert colors

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear | | | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: *suspect problem with redox sensor



Pond: Bubna Slough

Location of Sample: Westside road
Location of Elevation: _____

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
 pH 4 _____ pH 7 pH10
 1413us/cm 5000us/cm DO

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox* (mV)	Dissolved O ₂ (mg/L)	Comments
13:01	12.3	8.87	3403.0	2210.0	-127.2	13.73	lots of small invertebrates,

Odour: ☐ Yes ☒ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: * Suspect problem with redox sensor.



Pond: Little Robert Lake

Location of Sample: _____
Location of Elevation: _____

Others _____

Turbidity: Clear I I (I) I I I I I I I I I I I I I I I I I I I Very Silty

Notes: * Suspect problem with redox sensor



Pond: Bredin Pond

Location of Sample: _____
Location of Elevation: sensor

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 ☒ pH10 ☒
1413 μ S/cm 5000 μ S/cm ☒ DO ☒

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox* (mV)	Dissolved O ₂ (mg/L)	Comments
0929	12.5°C	8.76	1984	1207	-135.6	8.36	green, leafy algae.

O odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear I I I I I I I I I I X I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: some small invertebrates, lots of algae. No fish or bottled samples.

* Suspect problem ~ Redox sensor

SURFACE WATER SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun
Temperature: 18°C

Date: 19-OCT-22
Tech: RS

Pond: Slough #2

POND INFORMATION

Time of Measurement: 13:30
Pond Elevation: low

Location of Sample: _____
Location of Elevation: _____

EQUIPMENT LIST

☒ Swing Sampler

☐ Hydrolift

☐ Submersible

☐ Peristaltic

Others _____

Multi-meter Model: ☐ YSI Pro ☐ Other _____

☐ Field Bump ☒ Field Calibration

pH 4 _____ pH 7 ✓ pH10 ✓

1413µs/cm _____ 5000µs/cm ✓ DO ✓ 1

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
13:31	13.9	8.88	5950	867.5	-133.3	3.88	lots of invertebrates swimming.

Odour: ☐ Yes ☒ No If Yes, describe _____

Sheen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear 0 ||||| Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	☒ Plastic	☐ Glass					1	☐ Yes	☒ No
Metals-Tot	☒ Plastic	☐ Glass		1				☐ Yes	☒ No
Mercury-Tot	☐ Plastic	☒ Glass	1					☐ Yes	☒ No
Metals-Dis	☒ Plastic	☐ Glass		1				☒ Yes	☐ No
Organic C	☐ Plastic	☒ Glass	2					☐ Yes	☒ No
Coliforms	☒ Plastic	☐ Glass			1			☐ Yes	☒ No
COD/Nutrients	☒ Plastic	☐ Glass			1			☐ Yes	☒ No
DOC	☐ Plastic	☒ Glass	2					☒ Yes	☐ No
Mercury-Dis	☐ Plastic	☒ Glass	1					☒ Yes	☐ No

Notes: * Suspect problem with Redox probe sensor.



Pond: NE Pond

Location of Sample: _____
Location of Elevation: _____

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 _____ pH10 _____
1413us/cm 5000us/cm DO _____

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
10:00	10.5	9.15	2900	1885.0	-150.5	7.40	lots of invertebrates, look more

like little fish than the shrimp

[illegible]

Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: Suspect issue in Relax sensor



Pond: Robert Lake

Location of Sample: Park
Location of Elevation: Stallhagen - park

Multi-meter Model: ☒ YSI Pro ☐ Other _____
☐ Field Bump ☒ Field Calibration
pH 4 _____ pH 7 _____ pH10 _____
1413us/cm _____ 5000us/cm _____ DO _____

Time	Temp (°C)	pH (Units)	Conductivity (µS/cm)	TDS (mg/L)	*Redox (mV)	Dissolved O ₂ (mg/L)	Comments
14:53	11.9	9.33	12671.0	8235.5	-156.8	10.12	brown-green colour. nearly opaque

[illegible]

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass					1	☐ Yes	X No
Metals-Tot	X Plastic	☐ Glass		1				☐ Yes	X No
Mercury-Tot	☐ Plastic	X Glass	1					☐ Yes	X No
Metals-Dis	X Plastic	☐ Glass		1				X Yes	☐ No
Organic C	☐ Plastic	X Glass	2					☐ Yes	X No
Coliforms	X Plastic	☐ Glass			1			☐ Yes	X No
COD/Nutrients	X Plastic	☐ Glass			1			☐ Yes	X No
DOC	☐ Plastic	X Glass	2					X Yes	☐ No
Mercury-Dis	☐ Plastic	X Glass	1					X Yes	☐ No

Notes: * Suspect issue w/ Reflow probe station

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun Temperature: ~0°C Date: 7-Feb-22
 Sample Location: P2A2 Leachate M14 Tech: BS/KS **+ DUF 1**

EQUIPMENT LIST

☐ Grab Sampler Multi-meter Model: ☒ YSI Pro Plus Other: _____
☒ Bailer ☐ Field Bump
☐ Peristaltic pH 4 _____ pH 7 / pH10 1413µs/cm (2880) ✓
☐ Other Field Filtered via Peri Pump ☐ Field Calibration _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments

Odour: ☒ Yes ☐ No If Yes, describe H₂S-like
 Sheen: ☒ Yes ☐ No If Yes, describe _____
 Turbidity: Clear ||||| Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1			☐ Yes	☐ No
Metals	X Plastic	☐ Glass		1				☐ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☐ Yes	☐ No
COD, etc	☐ Plastic	X Glass		1				☐ Yes	☐ No
DOC, etc	☐ Plastic	X Glass		1				☐ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass			2			☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass		1				☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass	2					☐ Yes	☐ No
BOD	X Plastic	☐ Glass				1		☐ Yes	☐ No
VFA	☐ Plastic	X Glass	2					☐ Yes	☐ No

Notes: clear @ top of bailer down and very silty @ bottom
w/ black silt - possible that the duplicate samples got different parts of the
column - especially the sulfide bottles. There is a noticeable difference in
turbidity between bottles. Aridic preservatives highly sensitive.

FOS analysis completed, reported separately.
See photos in FOS folder.

Rep L for BTEX/VOCs, sulfides, nutrients only

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud Temperature: -3 Date: 4-Feb-2022
 Sample Location: Leachate wet well Tech: KS/RB

EQUIPMENT LIST

☐ Grab Sampler Multi-meter Model: ☒ YSI Pro Plus Other: _____
☒ Bailer ☐ Field Bump
☐ Peristaltic pH 4 _____ pH 7 ☒ pH10 ☒ 1413µs/cm 12820µs/cm ✓
☐ Other _____ ☒ Field Calibration _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
09:31	10.8	7.87	12580	8177	-358.8	0.61	

Odour: ☒ Yes ☐ No If Yes, describe H₂S like
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear 11111111111111111111 Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	☒ Plastic	☐ Glass			1			☐ Yes	☒ No
Metals	☒ Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	☒ Glass	1					☒ Yes	☐ No
COD, etc	☐ Plastic	☒ Glass		1				☐ Yes	☒ No
DOC, etc	☐ Plastic	☒ Glass	2	1				☒ Yes	☒ No
LEPH/HEPH	☐ Plastic	☒ Glass			2			☐ Yes	☒ No
Sulfide	☒ Plastic	☐ Glass		1				☐ Yes	☐ No
VOC/BTEX	☐ Plastic	☒ Glass	2					☐ Yes	☒ No
BOD	☒ Plastic	☐ Glass				1		☐ Yes	☐ No
VFA	☐ Plastic	☒ Glass	2					☐ Yes	☒ No

+ FOG 1L + total Metals

Notes: Yellow tint. Relatively clear. Slight sheen on WW surface,
not noticed in bailer. Violently reactive w/ preservatives, in
especially nutrient bottle and metals bottle. Saw foam in bailer.
Pumps running + biocide being added @ time of sample.
FG analysis completed, reported separately.



LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud, breezy Temperature: -3°C Date: 4-Feb-22
Sample Location: open Pt Leachte MH-2 Tech: Bro/LJS

- Grab Sampler

☒ Bailer

- ☐ Peristaltic

☐ OtherMulti-meter Model: ☒ YSI Pro Plus Other:

☐ Field Bump

pH 4 _____ pH 7 _____ ☒ pH10 ☒ 1413us/cm

☒ Field Calibration #170

FIELD MONITORING

[illegible]

+ FOG + metals (tot)

Notes:

Notes: See photos - Silty w/ ~~large~~ floating debris. (leaning towards top of column - grey-yellow. Famine in bottle.

Feb, analysis of total refals completed, reported separately



LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud, breezy Temperature: -3°C Date: 4-Feb-22
Sample Location: 1) Pump house mt Tech: BB/ks

- Grab Sampler

Multi-meter Model: ☒ YSI Pro Plus Other:

☒ Bailer

☐ Field Bump

- ☐ Peristaltic

pH 4 pH 7 ✓ pH10 1443 $\mu\text{S}/\text{cm}$ 16880 ✓

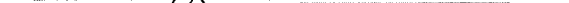
☐ Other

☒ Field Calibration +100%

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
11:12a	11.0	8.16	11406	7416.5	-317.2	2.51	

Odour: ☒ Yes ☐ No If Yes, describe

Shoen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear  Very Silty *See picture*

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1			☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, etc	☐ Plastic	X Glass		1				☐ Yes	☒ No
DOC, etc	☐ Plastic	X Glass	2	1				☐ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass			2			☐ Yes	☒ No
Sulfide	X Plastic	☐ Glass		1				☐ Yes	☒ No
VOC/BTEX	☐ Plastic	X Glass	2					☐ Yes	☒ No
BOD	X Plastic	☐ Glass				1		☐ Yes	☒ No
VFA	☐ Plastic	X Glass	2					☐ Yes	☒ No

FOG, metals (+)
Notes: See pictures. Yellow, silty near bottom. Large floaties.
Very reactive w/ rod + metals preservatives - lots of gas/foam produced.
Tox analysis completed, reported separately.

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun / clear Temperature: 20°C Date: 23-Sun-2022
 Sample Location: P1 Leachate M1-2 Tech: CB/AG

EQUIPMENT LIST

☐ Grab Sampler Multi-meter Model: ☒ YSI Pro Plus Other: _____
☒ Bailer ☐ Field Bump
☐ Peristaltic pH 4 _____ pH 7 ~ pH10 ✓ 12880 uS/cm ✓
☐ Other _____ ☒ Field Calibration _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
11:47	12.4	7.36	8677	5642	-271.8	2.23	Shallow on well surface.

Odour: ☒ Yes ☐ No If Yes, describe _____
 Sheen: ☐ Yes ☒ No If Yes, describe none in bottles
 Turbidity: Clear ||||| Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass			1			☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, etc	☐ Plastic X Glass		1				☐ Yes ☒ No	
DOC, etc	☐ Plastic X Glass		1				☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass			2			☐ Yes ☒ No	
Sulfide	X Plastic ☐ Glass		1				☐ Yes ☒ No	
VOC/BTEX	☐ Plastic X Glass	2					☐ Yes ☒ No	
BOD	X Plastic ☐ Glass				1		☐ Yes ☒ No	
VFA	☐ Plastic X Glass	2					☐ Yes ☐ No	

Notes: lots of black sediment in bottom of bottles - light brown
when variable amounts of sediment in bottles - more wet
in bottom of the amber column



LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: sun/cloud Temperature: ~20°C
Sample Location: P242 Leachate wet

Date: 23 June 2022

Tech: SD/AG

EQUIPMENT LIST

- ☐
- Other _____

 Field Bump

pH 4 pH 7 pH 10 1413 $\mu\text{S}/\text{cm}$

☒ Field Calibration

FIELD MONITORING

Odour: ☒ Yes ☒ No If Yes, describe _____
 Sheen: ☒ Yes ☐ No If Yes, describe Shiny/oily
 Turbidity: Clear | | | | | | | | | | | | | | | | | | | | Very Silty

Notes: Very limited sample quantities.



Weather: sun + cloud Temperature: ~16°C Date: 23-June-22
Sample Location: N Pumphouse inlet Tech: RJA/AG

Notes: Very reactive w/ mineral preservatives especially

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: in/cloud Temperature: ~22°C Date: 23-June-2012
Sample Location: 5 hours after wet well Tech: 187/AB

EQUIPMENT LIST

- ☐ Grab Sampler Multi-meter Model: ☒ YSI Pro Plus Other: _____
☒ Bailer ☐ Field Bump
☒ Peristaltic *→ filter* pH 4 _____ pH 7 *✓* pH10 *✓* 1413µs/cm *(2800) ✓*
☐ Other _____ ☒ Field Calibration _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
13:02	12.8	8.00	9707	6305.0	~~363.5~~ 363.5	1.34	light brown/yellow

Odour: ☒ Yes ☐ No If Yes, describe H₂S like
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1			☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, etc	☐ Plastic	X Glass		1				☐ Yes	☒ No
DOC, etc	☐ Plastic	X Glass		1				☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass			2			☐ Yes	☒ No
Sulfide	X Plastic	☐ Glass		1				☐ Yes	☒ No
VOC/BTEX	☐ Plastic	X Glass	2					☐ Yes	☒ No
BOD	X Plastic	☐ Glass				1		☐ Yes	☒ No
VFA	☐ Plastic	X Glass	2					☐ Yes	☒ No

Notes: aerator turned off ~ 2h before sampling to allow
gas to clear

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud, smoke Temperature: 16° Date: 14-Sept-22
 Sample Location: N Pump house Mt Tech: AB/AS

EQUIPMENT LIST

☐ Grab Sampler Multi-meter Model: ☒ YSI Pro Plus Other: _____
☐ Bailer ☐ Field Bump
☒ Peristaltic pH 4 _____ pH 7 ☒ pH10 ☒ 12820
☐ Other _____ ☒ Field Calibration _____ 5000µs/cm ☒

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
11:15	16.8	8.12	12530	8157	-403.9	0.72	brown tint, silty.

Odour: ☒ Yes ☐ No If Yes, describe HS like
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☐ Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1			☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☒ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, etc	☐ Plastic	X Glass		1				☐ Yes	☒ No
DOC, etc	☐ Plastic	X Glass		2				☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass			2			☐ Yes	☒ No
Sulfide	X Plastic	☐ Glass		1				☐ Yes	☒ No
VOC/BTEX	☐ Plastic	X Glass	2					☐ Yes	☒ No
BOD	X Plastic	☐ Glass				1		☐ Yes	☒ No
VFA	☐ Plastic	X Glass	2					☐ Yes	☒ No

Notes: Sludges / film on top of water in the Mt. Water
very reactive w/ the preservatives, particularly COD bottle.



LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud, smoke Temperature: 15.4°C / 60°C Date: 14-sept-2022
Sample Location: P2 A2 Leachate M.H. Tech: BB/AB

☐ Grab Sampler Multi-meter Model: ☒ YSI Pro Plus Other: _____
☐ Bailer ☐ Field Bump
☒ Peristaltic pH 4 _____ pH 7 ☒ pH10 ☒ 12880
☐ Other ☒ Field Calibration _____ 5000 $\mu\text{S}/\text{cm}$ ☒

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
10:30	15.4	7.04	10397	6747.0	28.1	0.79	

Odour: ☒ Yes ☐ No If Yes, describe Sweet - gerbany
 Sheen: ☒ Yes ☐ No If Yes, describe _____
 Turbidity: Clear | | | | | | | | | | () | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1			☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, etc	☐ Plastic	X Glass		1				☐ Yes	☒ No
DOC, etc	☐ Plastic	X Glass		1				☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass			2			☐ Yes	☒ No
Sulfide	X Plastic	☐ Glass		1				☐ Yes	☒ No
VOC/BTEX	☐ Plastic	X Glass	2					☐ Yes	☒ No
BOD	X Plastic	☐ Glass				1		☐ Yes	☒ No
VFA	☐ Plastic	X Glass	2					☐ Yes	☒ No

Notes: Water in wet well had thick chunky/jagged rainbow sheen. Not
visible in the bottles. Brown tint, silty. Reactive w/ preservatives, particularly
the red bottle.

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun, wind Temperature: 15°C Date: 20-Sept-2022
 Sample Location: Leachate wet well Tech: CB

EQUIPMENT LIST

☐ Grab Sampler Multi-meter Model: ☒ YSI Pro Plus Other: _____
☐ Bailer ☐ Field Bump
☒ Peristaltic pH 4 _____ pH 7 ☒ pH10 ☒ 5000µs/cm ☒
☐ Other _____ ☒ Field Calibration _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
12:04	16.4	7.69	13622	8853.5	-86.2	4.84	dark tea-like brown tint

Odour: ☒ Yes ☐ No If Yes, describe Sulfide
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ☐ Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass			1			☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☒ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, etc	☐ Plastic X Glass		1				☐ Yes ☒ No	
DOC, etc	☐ Plastic X Glass	2	1				☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass			2			☐ Yes ☒ No	
Sulfide	X Plastic ☐ Glass		1				☐ Yes ☒ No	
VOC/BTEX	☐ Plastic X Glass	2					☐ Yes ☒ No	
BOD	X Plastic ☐ Glass				X		☐ Yes ☐ No	
VFA	☐ Plastic X Glass	2					☒ Yes ☐ No	

Notes: Pumps running + bioxide addition occurring at time of sampling. Slight sheen visible on surface of ww, none in the bottles.

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: Sun, breeze Temperature: 16°C Date: 20-sept-22
 Sample Location: Pl leachate mlt-2 Tech: 1307

EQUIPMENT LIST

☐ Grab Sampler Multi-meter Model: ☒ YSI Pro Plus Other: _____
☐ Bailer ☐ Field Bump 17820
☒ Peristaltic pH 4 _____ pH 7 ✓ pH10 ✓ 5000µs/cm
☐ Other _____ ☐ Field Calibration _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
13:05	20.5	7.22	20353	132038	-511	16.71	gray-black slat, gassy.

Odour: ☒ Yes ☐ No If Yes, describe sulphur, gasburry
 Sheen: ☐ Yes ☒ No If Yes, describe _____
 Turbidity: Clear ||||| Very Silty

Analysis	Type	Container Size					Filtered	
		40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic ☐ Glass			1			☐ Yes ☒ No	
Metals	X Plastic ☐ Glass		1				☐ Yes ☐ No	
Mercury	☐ Plastic X Glass	1					☒ Yes ☐ No	
COD, etc	☐ Plastic X Glass		1				☐ Yes ☒ No	
DOC, etc	☐ Plastic X Glass	2	1				☒ Yes ☐ No	
LEPH/HEPH	☐ Plastic X Glass			2			☐ Yes ☒ No	
Sulfide	X Plastic ☐ Glass		1				☐ Yes ☒ No	
VOC/BTEX	☐ Plastic X Glass	2					☐ Yes ☒ No	
BOD	X Plastic ☐ Glass				1		☐ Yes ☒ No	
VFA	☐ Plastic X Glass	2					☐ Yes ☒ No	

Notes: lots of gas coming out of solution in sample tube. Gray brown
LG present in leachate pipe.
Rebate 2 Hi-cap. watera filters.



LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud/sprinkling Temperature: 10°C Date: 20-OCT-22
Sample Location: PI location M4-2 Tech: 1803

- Grab Sampler

☐ Bailer

☒ Peristaltic

☐ Other

Multi-meter Model: ☒ YSI Pro Plus Other: _____

☐ Field Bump

pH 4 pH 7 pH10 5000 $\mu\text{s}/\text{cm}$ ✓

☐ Field Calibration

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
12:16	14.8	7.38	17862	11609	-59.9	1.56	lots of LFG/methane in hole.

Odour: ☒ Yes ☐ No If Yes, describe white

Sheen: ☐ Yes ☒ No If Yes, describe

[illegible]

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1			☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, etc	☐ Plastic	X Glass		1				☐ Yes	☐ No
DOC, etc	☐ Plastic	X Glass		1				☐ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass			2			☐ Yes	☐ No
Sulfide	X Plastic	☐ Glass		1				☐ Yes	☐ No
VOC/BTEX	☐ Plastic	X Glass	2					☐ Yes	☐ No
BOD	X Plastic	☐ Glass				1		☐ Yes	☐ No
VFA	☐ Plastic	X Glass	2					☐ Yes	☐ No

Notes: Nearly black in ~~water~~ lots of gas & volatility in sample
Some in tables in the tube, not a tubing issue.

Dear Alice



LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: Windy cloud Temperature: 80°C Date: 20-OCT-22
Sample Location: Streamside wet well Tech: BS

☒ Field Calibration

FIELD MONITORING

Odour: ☒ Yes ☐ No If Yes, describe Sulphide
 Sheen: ☐ Yes ☒ No If Yes, describe Sheen on wet well surface
 Turbidity: Clear ☐ Very Silty

Notes: slight cloudy sheen on W/W surface. none on sample water.
Dark brown tea like color.

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: Cloud Temperature: 100C Date: 20-01-22
Sample Location: River N Punahale mtd Tech: RSB

EQUIPMENT LIST

- ☐ Grab Sampler
☐ Bailer
☒ Peristaltic
☐ Other

Multi-meter Model: ☒ YSI Pro Plus Other: _____

- ☐ Field Bump

pH 4 pH 7 ☒ pH 10

- Field Calibration

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
13:12	15.2	7.95	12942	8599	-92.8	2.94	direct drop-in measurement u/45I

Odour: ☒ Yes ☐ No If Yes, describe light & clean

Shoen: ☐ Yes ☒ No If Yes, describe _____

Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1			☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, etc	☐ Plastic	X Glass		1				☐ Yes	☒ No
DOC, etc	☐ Plastic	X Glass		1				☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass			2			☐ Yes	☒ No
Sulfide	X Plastic	☐ Glass		1				☐ Yes	☒ No
VOC/BTEX	☐ Plastic	X Glass	2					☐ Yes	☒ No
BOD	X Plastic	☐ Glass				1		☐ Yes	☒ No
VFA	☐ Plastic	X Glass	2					☐ Yes	☒ No

Notes: brwn-grey-black in colour. No bubbles or lumps.

LEACHATE SAMPLING FORM

GLENMORE LANDFILL

Weather: cloud Temperature: 10°C Date: 20-0CT-22
 Sample Location: P247 Leachate m/A Tech: BS

EQUIPMENT LIST

☐ Grab Sampler Multi-meter Model: ☐ YSI Pro Plus Other: _____
☐ Bailer ☐ Field Bump
☒ Peristaltic pH 4 _____ pH 7 _____ pH10 12880 ✓ DO% ✓
☐ Other _____ ☒ Field Calibration _____

FIELD MONITORING

Time	Temp (°C)	pH (Units)	Conductivity (uS/cm)	TDS (mg/L)	Redox (mV)	Dissolved O ₂ (mg/L)	Comments
14:01	13.6	7.26	10160	6004	-49.7	3.14	direct drop-in measurement

Odour: ☒ Yes ☐ No If Yes, describe rubbery??
 Sheen: ☐ Yes ☒ No If Yes, describe sheen on well surface but not sample water.
 Turbidity: Clear IIIIIIIIII IIIIIIIIII Very Silty

Analysis	Type		Container Size					Filtered	
			40 mL	125 mL	250 mL	500 mL	1 L		
General	X Plastic	☐ Glass			1			☐ Yes	☒ No
Metals	X Plastic	☐ Glass		1				☒ Yes	☐ No
Mercury	☐ Plastic	X Glass	1					☒ Yes	☐ No
COD, etc	☐ Plastic	X Glass		1				☐ Yes	☒ No
DOC, etc	☐ Plastic	X Glass		1				☒ Yes	☐ No
LEPH/HEPH	☐ Plastic	X Glass			2			☐ Yes	☒ No
Sulfide	X Plastic	☐ Glass		1				☐ Yes	☒ No
VOC/BTEX	☐ Plastic	X Glass	2					☐ Yes	☒ No
BOD	X Plastic	☐ Glass				1		☐ Yes	☒ No
VFA	☐ Plastic	X Glass	2					☐ Yes	☒ No

Notes: Brown tint

APPENDIX E
FIELD METHODOLOGY

APPENDIX E – FIELD METHODOLOGY

2022 FIELD METHODS

In 2022, water monitoring and sampling events at the Site were completed by City of Kelowna (CoK) staff. Field activities were conducted according to BC ENV regulatory requirements including the *BC Field Sampling Manual, Part E Water and Wastewater Sampling, Groundwater Pollution Monitoring*, available online at: https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/monitoring/emre/bc_field_sampling_manual_part_e.pdf

During the sampling events, equipment and tools used to collect the samples were washed with laboratory grade detergent and rinsed with distilled water. Dedicated new nitrile gloves were worn at each sample point for handling sampling equipment and samples and were changed between sample locations.

The field 2022 methods were consistent with those of previous years and are summarized below.

GROUNDWATER MONITORING AND SAMPLING

CoK staff conducted groundwater monitoring and sampling semi-annually in spring (May/June) and fall (September/October). Monitoring of select wells for depth to water and depth to bottom of the well was completed using a water level probe lowered into the well and measured against the top of the well casing.

Prior to sample collection, purging of groundwater from the well was completed which consisted of removing water from each well using a dedicated bailer and string. Field water quality parameters of temperature, pH, conductivity, redox and dissolved oxygen using a YSI Pro Multiparameter Meter (YSI) were measured at regular intervals purging of the well continued until three well volumes were removed, and the field parameters had stabilized.

Sample coolers, bottles, preservatives, and filters were obtained by CoK staff. Groundwater samples were collected from select monitoring wells using a dedicated bailer, and/or a peristaltic pump with dedicated tubing at each well.

Representative groundwater samples were collected in clean, pre-charged laboratory-supplied sample bottles provided by CARO Analytical Services (CARO). Samples collected for dissolved metals were field filtered using a 0.45-micron filter. Samples were stored in an ice-chilled cooler in the field, and refrigerated as needed, then submitted to CARO for analysis of select parameters. Standard chain of custody procedures were followed and duplicate samples were not identified to the laboratory. Samples were received and analyzed by the laboratory within the recommended holding time.

Duplicate samples were collected at a rate of one for up to every ten samples collected.

Groundwater purging and sampling records are provided in Appendix D.

Purged groundwater generated during well development and sampling was stored in a secure drum on-Site, pending characterization.

SURFACE WATER SAMPLING

Surface water sampling was conducted by CoK staff quarterly in March, June, September and October 2022.

Sample coolers, bottles, preservatives, and filters were obtained from CARO by CoK staff. Leachate samples were collected using a swing sampler. Representative water samples were collected in clean, pre-charged laboratory-supplied sample bottles provided by CARO. Samples collected for dissolved metals were field filtered using a 0.45-micron filter. Samples were stored in an ice-chilled cooler in the field, and

refrigerated as needed, then submitted to CARO for analysis of select parameters. Standard chain of custody procedures were followed and duplicate samples were not identified to the laboratory. Samples were received and analyzed by the laboratory within the recommended holding time.

Duplicate samples were collected at a rate of one for up to every ten samples collected.

LEACHATE SAMPLING

Leachate sampling was conducted by CoK staff quarterly, in March, June, September and November 2022. Sample coolers, bottles, preservatives, and filters were obtained from CARO by CoK staff. Leachate samples were collected using a dedicated bailer and string and/or a peristaltic pump with dedicated tubing. Representative leachate samples were collected in clean, pre-charged laboratory-supplied sample bottles provided by CARO. Samples collected for dissolved metals were field filtered using a 0.45-micron filter. Samples were stored in an ice-chilled cooler in the field, and refrigerated as needed, then submitted to CARO for analysis of select parameters. Standard chain of custody procedures were followed and duplicate samples were not identified to the laboratory. Samples were received and analyzed by the laboratory within the recommended holding time.

SURVEY

In March and September 2022, CoK conducted a horizontal survey and an elevation survey of seventeen monitoring wells and provided a data table of the coordinates and the groundwater elevations results to Keltech. Elevations were measured to the geodetic data obtained during site surveys. Keltech used the elevation data to establish spring and fall inferred groundwater flow direction beneath the Site.

LABORATORY

CARO provided sampling containers and performed the laboratory analysis of water samples. CARO is certified by the Canadian Association for Laboratory Accreditation (CALA) for analytical methods used for this program.

APPENDIX F

QUALITY ASSURANCE AND QUALITY CONTROL: METHODS AND RESULTS

APPENDIX F – QUALITY ASSURANCE AND QUALITY CONTROL

1.1 METHODS

A quality assurance and quality control (QA/QC) program should be implemented during the monitoring program so that the sampling and analytical data is meaningful, reproducible and reliable. Standard industry field procedures should be used in both the collection (field program) and analysis (laboratory) of water samples. The following includes a brief summary of the QA/QC measures to be implemented during the field program and during the review of the data, as well as QA/QC measures implemented by the laboratory.

Quality control (QC) measures used in the collection, preservation and delivery of samples include the following:

- Sampling methods to be consistent with established protocols and provincial requirements;
- Field notes, including the geographic locations of samples collected, to be recorded during the stages of the monitoring program and to be available upon request;
- Samples to be placed and stored in laboratory provided containers. Sample containers not to be reused.
- Samples to be stored in coolers and chilled with ice or ice packs during transport to the analytical laboratory; and,
- Samples to be transported to the laboratory using laboratory chain of custody procedures.

The Quality Assurance (QA) measures established for the field program should include:

- Submission of blind field duplicate samples for a minimum of 10% of the samples analyzed. A blind field duplicate sample is a second sample of certain media (e.g., soil, water, soil vapour) from the same location that is submitted to the analytical laboratory under a separate label such that the lab has no prior knowledge that it is a duplicate.
- The relative percent difference (RPD – the absolute difference between the two values, divided by the mean) of duplicate analyses is used to evaluate the sample result variability. An RPD value of less than 0.3 (or 30 percent) is considered an indication of acceptable sample variability, and therefore represents a good correlation between the duplicate samples. An RPD value of greater than 30 percent may reflect “within bottle” variability (which reflects the nature of the contaminant distribution) or variation in test procedures.

The British Columbia Laboratory Manual (published by (now formerly) the Ministry of Environment), contains recommended Data Quality Objectives (DQOs) for laboratory duplicate RPD (Province of BC, 2009). It is recognized that these DQOs are intended for laboratory duplicates and do not include provisions for additional variability in field duplicates. However, these DQOs are considered a conservative screen for assessing the quality of field duplicates. The DQOs applied to this monitoring program should be as follows:

In general, an RPD greater than these DQOs may reflect “within sample” variability which reflects the nature of the contaminant distribution, or variation in the test procedures; the DQOs described above were established for laboratory results and have been applied to this program.

The following criteria were considered acceptable for laboratory QA/QC samples:

- Analytical blanks should be below the detection limits used for the specific analysis;
- Laboratory duplicates should fall within the DQO set by the laboratory; and,

- Analytical results for the reference materials or spiked standards should be within the target specified by the laboratory.

The laboratory also noted the sample integrity upon arrival at the laboratory, including:

- Sample condition (i.e., broken bottles, missing labels);
- Sample temperature; and,
- Analysis holding time.

Caro Analytics of Kelowna, BC performed the analysis of the water samples for this program. CARO is a registered and holds certification by the Canadian Association for Laboratory Accreditation Inc. (CALA) for the analyses performed. The samples submitted to CARO were subject to QA/QC procedures specific to the laboratory, which include internal and surrogate standards, replicates and duplicates, method blanks and method spikes. Reports from the laboratory are internally reviewed prior to submission. The analytical laboratory also incorporated and reported the results of internal checks. These were used to assess the reliability, accuracy and reproducibility of the data.

1.2 RESULTS

Chain of custody procedures should be followed during the sampling events and accompanied sample submissions. Samples should be submitted to the laboratory under chain-of-custody protocols using forms that do not identify the sampling locations, expected concentrations or QA/QC samples, such as field duplicate samples. Samples should be stored in coolers prior to submission to the analytical laboratory. The samples should be received at the laboratory at temperatures less than 10°C.

The target for QA/QC for the monitoring program for duplicates is one sample for every ten samples analyzed for compound. The laboratory also follows protocol regarding duplicates and performs analysis on its own series of duplicate samples.

The duplicate ratio was approximately 10% or slightly greater for parameters collected. This target was met. The RPD values, where they could be calculated, generally met targets for all samples with various RPD exceedances occurring in the following parameters:

Sample ID/ Duplicate ID	Parameter Exceeded	RPD Value	Sampling Event
GL23-1/DUP 2	Dissolved Copper	67.72%	Spring Groundwater
GL41-3/DUP 3	Dissolved Aluminum	38.68%	Spring Groundwater
GL41-3/DUP 3	Dissolved Copper	34.02%	Spring Groundwater
GL28-1/DUP 3	Dissolved Copper	41.9%	Fall Groundwater
P2A2 Leachate MH/DUP 1	Chemical Oxygen Demand	62.18%	Q1 Leachate
P2A2 Leachate MH/DUP 1	Phosphorus, Total (as P)	68.40%	Q1 Leachate
P2A2 Leachate MH/DUP 1	Sulfide, Total	190.90%	Q1 Leachate
N Pumphouse MH	Chemical Oxygen Demand	42.60%	Q2 Leachate
Bredin Pond	Dissolved Aluminum	52.92%	Q1 Surface Water
Bredin Pond	Coliforms, Total (Q Tray)	62.83%	Q2 Surface Water
Tutt Pond	Coliforms, Total (Q Tray)	39.34%	Q4 Surface Water
Tutt Pond	Coliforms, Fecal (Q Tray)	43.28%	Q4 Surface Water

More detailed RPD values for all parameters are presented in Tables 1, 2 and 3 below.

Table 1: Summary of Groundwater QA/QC Data

SAMPLE ID Parameter	Units	RDL	GL-39-1 (Spring)	DUP 1 (Spring)	Relative Percent	RDL	GL-23-1 (Spring)	DUP 2 (Spring)	Relative Percent	RDL	GL-41-3 (Spring)	DUP 3 (Spring)	Relative Percent	RDL	GL-4-1 (Fall)	DUP 1 (Fall)	Relative Percent	RDL	GL-15-2 (Fall)	DUP 2 (Fall)	Relative Percent	RDL	GL-28-1 (Fall)	DUP 3 (Fall)	Relative Percent
Bromide	mg/L	0.1	<1.00	<1.00	NA	0.1	<1.00	<1.00	NA	1	<1.00	<1.00	NA	0.1	<0.10	<0.10	NA	0.1	<0.10	<0.10	NA	0.1	<1.00	<1.00	NA
Chloride	mg/L	0.1	145	147	1.37%	0.1	31.9	29.2	8.84%	1	250	254	1.59%	0.1	18.2	18.2	0.00%	0.1	18.2	18.2	0.00%	0.1	93.5	88.3	5.72%
Fluoride	mg/L	0.1	<1.00	<1.00	NA	0.1	0.57	<1.00	NA	1	<1.00	<1.00	NA	0.1	1.97	1.96	0.51%	0.1	1.97	1.96	0.51%	0.1	<1.00	<1.00	NA
Nitrate (as N)	mg/L	0.01	4.88	4.39	10.57%	0.01	0.041	<0.100	NA	0.1	1.32	1.33	0.75%	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.100	<0.100	NA
Nitrite (as N)	mg/L	0.01	<0.100	<0.100	NA	0.01	<0.010	<0.100	NA	0.1	<0.100	<0.100	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.100	<0.100	NA
Phosphate (as P)	mg/L	0.005	<0.0500	<0.0500	NA	0.005	<0.0500	<0.0500	NA	0.05	<0.0500	<0.0500	NA	0.005	<0.0500	<0.0500	NA	0.005	<0.0500	<0.0500	NA	0.005	<0.0500	<0.0500	NA
Sulfate	mg/L	1	2740	2500	9.16%	10	416	421	1.19%	10	108	114	5.41%	1	551	538	2.39%	1	551	538	2.39%	1	2130	2050	3.83%
Hardness, Total (as CaCO3)	mg/L	0.125	2620	2630	0.38%	0.125	1170	1210	3.36%	0.125	474	475	0.21%	0.125	618	623	0.81%	0.125	618	623	0.81%	0.125	1850	1860	0.54%
Mercury, dissolved	mg/L	0.00001	<0.000010	<0.000010	NA	0.00001	<0.000010	<0.000010	NA	0.00001	<0.000010	<0.000010	NA	0.00001	<0.000010	<0.000010	NA	0.00001	<0.000010	<0.000010	NA	0.00001	<0.000010	<0.000010	NA
Aluminum, dissolved	ug/L	1	2	2.9	NA	1	2.9	3.1	NA	1	9.8	14.5	38.68%	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	5	<6.0	<6.0	NA
Antimony, dissolved	ug/L	0.05	<0.100	<0.100	NA	0.05	<0.050	<0.050	NA	0.05	0.063	0.063	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	0.148	0.148	NA
Arsenic, dissolved	ug/L	0.05	0.328	0.311	5.32%	0.05	0.478	0.467	2.33%	0.05	0.924	0.941	1.82%	0.05	2.44	2.49	2.03%	0.05	2.44	2.49	2.03%	0.05	0.865	0.854	1.28%
Barium, dissolved	ug/L	0.1	11.9	11	7.86%	0.1	68.8	69.6	1.16%	0.1	56.7	56.7	0.00%	0.1	16.2	16	1.24%	0.1	16.2	16	1.24%	0.1	11.4	12.4	8.40%
Beryllium, dissolved	ug/L	0.01	<0.020	<0.020	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.020	<0.020	NA
Bismuth, dissolved	ug/L	0.01	<0.020	<0.020	NA	0.01	0.011	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.020	<0.020	NA
Boron, dissolved	ug/L	10	13.7	13.6	NA	10	37.9	32.8	NA	2	25.5	26.4	3.47%	10	12.4	19.6	NA	10	12.4	19.6	NA	10	17.9	17.6	NA
Cadmium, dissolved	ug/L	0.004	0.0597	0.0556	7.11%	0.002	0.0486	0.0577	17.12%	0.002	0.0112	0.01	NA	0.002	<0.0100	<0.0100	NA	0.002	<0.0100	<0.0100	NA	0.002	0.0613	0.0585	4.67%
Calcium, dissolved	ug/L	100	237000	244000	2.91%	100	86300	91000	5.30%	50	47400	49300	3.93%	100	55300	55400	0.18%	100	55300	55400	0.18%	100	221000	218000	1.37%
Chromium, dissolved	ug/L	0.1	0.24	0.21	NA	0.1	0.21	0.17	NA	0.1	1.5	1.49	0.67%	0.1	0.17	0.18	NA	0.1	0.17	0.18	NA	0.1	<0.20	<0.20	NA
Cobalt, dissolved	ug/L	0.005	0.173	0.177	2.29%	0.005	0.755	0.776	2.74%	0.005	0.0508	0.0553	8.48%	0.005	0.0253	0.0237	NA	0.005	0.0253	0.0237	NA	0.005	0.984	0.981	0.31%
Copper, dissolved	ug/L	0.1	1.88	1.57	17.97%	0.1	4.25	2.1	67.72%	0.1	1	14.1	34.02%	0.1	<0.10	<0.10	NA	0.1	<0.10	<0.10	NA	0.1	1	1.53	41.90%
Iron, dissolved	ug/L	10	<4.0	<4.0	NA	10	4.5	4.2	NA	2	13.5	16.4	19.40%	10	687	715	3.99%	10	687	715	3.99%	10	190	189	0.53%
Lead, dissolved	ug/L	0.05	<0.100	<0.100	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.100	<0.100	NA
Lithium, dissolved	ug/L	0.05	76.4	77.1	0.91%	0.05	39.6	40.1	1.25%	0.05	31.1	32.8	5.32%	0.05	36.3	44.3	19.85%	0.05	36.3	44.3	19.85%	0.05	73.2	73.6	0.54%
Magnesium, dissolved	ug/L	10	492000	492000	0.00%	10	232000	239000	2.97%	5	86300	85300	1.17%	10	116000	118000	1.71%	10	116000	118000	1.71%	10	316000	320000	1.26%
Manganese, dissolved	ug/L	0.05	13.4	13.6	1.48%	0.05	309	329	6.27%	0.05	1.65	1.61	2.45%	0.05	72.7	74	1.77%	0.05	72.7	74	1.77%	0.05	279	278	0.36%
Molybdenum, dissolved	ug/L	0.01	20.3	20.1	0.99%	0.01	14.4	14.6	1.38%	0.01	6.82	6.8	0.29%	0.01	29.2	29.3	0.34%	0.01	29.2	29.3	0.34%	0.01	12.3	12.2	0.82%
Nickel, dissolved	ug/L	0.04	1.05	1.02	2.90%	0.04	8.48	8.77	3.36%	0.04	0.534	0.64	18.06%	0.04	0.255	0.286	11.46%	0.04	0.255	0.286	11.46%	0.04	2.61	2.57	1.54%
Phosphorus, dissolved	ug/L	10	<20	<20	NA	10	<10	<10	NA	10	25	28	NA	10	19	19	NA	10	19	19	NA	10	<20	<20	NA
Potassium, dissolved	ug/L	100	13900	13800	0.72%	100	16300	17000	4.20%	20	13600	13700	0.73%	100	6660	6900	3.54%	100	6660	6900	3.54%	100	10500	10600	0.95%
Selenium, dissolved	ug/L	0.1	4.69	4.75	1.27%	0.1	0.2	0.2	NA	0.1	0.43	0.42	NA	0.1	<0.10	<0.10	NA	0.1	<0.10	<0.10	NA	0.1	<0.20	<0.20	NA
Silicon, dissolved	ug/L	100	10500	10700	1.89%	100	11500	12500	8.33%	100	9260	9200	0.65%	100	10600	10900	2.79%	100	10600	10900	2.79%	100	10200	10400	1.94%
Silver, dissolved	ug/L	0.01	0.036	0.032	NA	0.01	0.022	0.025	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.020	<0.020	NA
Sodium, dissolved	ug/L	100	571000	575000	0.70%	100	197000	205000	3.98%	20	200000	199000	0.50%	100	196000	201000	2.52%	100	196000	201000	2.52%	100	386000	386000	0.00%
Strontium, dissolved	ug/L	0.1	7110	7300	2.64%	0.1	4770	4870	2.07%	0.1	1960	1970	0.51%	0.1	2420	2460	1.64%	0.1	2420	2460	1.64%	0.1	6100	6060	0.66%
Sulfur, dissolved	ug/L	1000	943000	976000	3.44%	1000	153000	166000	8.15%	1000	35700	36000	0.84%	1000	194000	200000	3.05%	1000	194000	200000	3.05%	1000	741000	746000	0.67%
Tellurium, dissolved	ug/L	0.05	<0.100	<0.100	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.100	<0.100	NA
Thallium, dissolved	ug/L	0.004	0.0149	0.0173	NA	0.004	<0.0040	<0.0040	NA	0.004	0.0058	<0.0040	NA	0.004	<0.0040	<0.0040	NA	0.004	<0.0040	<0.0040	NA	0.004	0.013	0.0143	NA
Thorium, dissolved	ug/L	0.01	<0.020	<0.020	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.020	<0.020	NA
Tin, dissolved	ug/L	0.05	<0.100	<0.100	NA	0.05	0.065	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.100	<0.100	NA
Titanium, dissolved	ug/L	0.2	<0.40	<0.40	NA	0.2	0.29	<0.20	NA	0.2	0.48	0.53	NA	0.2	<0.20	<0.20	NA	0.2	<0.20	<0.20	NA	0.2	<0.40	<0.40	NA
Tungsten, dissolved	ug/L	0.2	<0.40	<0.40	NA	0.2	<0.20	<0.20	NA	0.2	<0.20	<0.20	NA	0.2	<0.20	<0.20	NA	0.2	<0.20	<0.20	NA	0.2	<0.40	<0.40	NA
Uranium, dissolved	ug/L	0.001	244	238	2.49%	0.001	73.5	73.6	0.14%	0.001	14.1	14.3	1.41%	0.001	45.6	47.3	3.66%	0.001	45.6	47.3	3.66%	0.001	133	138	3.69%
Vanadium, dissolved	ug/L	1	<2.00	<2.00	NA	1	<1.00	<1.00	NA	1	1.65	1.68	NA	1	<1.00	<1.00	NA	1	<1.00	<1.00	NA	1	<2.00	<2.00	NA
Zinc, dissolved	ug/L	1	<2.0	<2.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<2.0	2	NA
Zirconium, dissolved	ug/L	0.02	0.075	0.071	NA	0.02	0.362	0.36	0.55%	0.02	0.032	0.028	NA	0.02	0.067	0.072	NA	0.02	0.067	0.072	NA	0.02	0.186	0.204	9.23%
Alkalinity, Total (as CaCO3)	mg/L	1	546	542	0.74%	1	962	964	0.21%	1	533	526	1.32%	1	575	569	1.05%	1	575	569	1.05%	1	477	484	1.46%
Alkalinity, Phenolphthalein (as C	mg/L	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	546	542	0.74%	1	962	964	0.21%	1	533	526	1.32%	1	575	569	1.05%	1	575	569	1.05%	1	477	484	1.46%
Alkalinity, Carbonate (as CaCO3)	mg/L	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0														

Table 2: Summary of Suface Water QA/QC Data

SAMPLE ID Parameter	Units	RDL	Bredin Pond (Q1)	DUP 1 (Q1)	Relative Percent	RDL	Bredin Pond (Q2)	DUP 1 (Q2)	Relative Percent	RDL	Tutt Pond (Q3)	DUP 1 (Q3)	Relative Percent	RDL	Tutt Pond (Q4)	DUP 1 (Q4)	Relative Percent
Bromide	mg/L	0.1	<0.10	<0.10	NA	0.1	<0.10	<0.10	NA	1	<1.00	<1.00	NA	0.1	<1.00	<1.00	NA
Chloride	mg/L	1	177	180	1.68%	1	167	170	1.78%	1	269	284	5.42%	1	268	264	1.50%
Fluoride	mg/L	0.1	0.78	0.84	7.41%	0.1	1	0.99	1.01%	1	<1.00	<1.00	NA	0.1	<1.00	<1.00	NA
Nitrate (as N)	mg/L	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.1	<0.100	<0.100	NA	0.01	<0.100	<0.100	NA
Nitrite (as N)	mg/L	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.1	<0.100	<0.100	NA	0.01	0.108	0.106	1.87%
Phosphate (as P)	mg/L	0.005	<0.0050	<0.0050	NA	0.005	<0.0050	<0.0050	NA	0.1	<0.100	<0.100	NA	0.005	0.059	0.073	21.21%
Sulfate	mg/L	10	203	206	1.47%	10	255	255	0.00%	100	910	886	2.67%	10	997	1020	2.28%
Hardness, Total (as CaCO3)	mg/L	0.625	650	662	1.83%	0.125	626	624	0.32%	0.125	1060	1050	0.95%	0.125	1270	1270	0.00%
Nitrate+Nitrite (as N)	mg/L	0.01	<0.0100	<0.0100	NA	0.01	<0.0100	<0.0100	NA	0.1	<0.100	<0.100	NA	0.01	0.108	0.106	1.87%
Nitrogen, Total	mg/L	0.05	1.59	1.56	1.90%	0.05	1.03	1.1	6.57%	0.1	1.43	1.62	12.46%	0.05	1.72	1.73	0.58%
Copper, dissolved	ug/L	0.5	1.31	<0.50	NA	0.1	0.46	0.45	NA	0.2	0.97	0.89	NA	0.1	0.6	0.59	1.68%
Alkalinity, Total (as CaCO3)	mg/L	1	584	602	3.04%	1	647	642	0.78%	1	746	745	0.13%	1	707	699	1.14%
Alkalinity, Phenolphthalein (as C	mg/L	1	25.5	28.1	9.70%	1	61.5	57.7	6.38%	1	50.7	55	8.14%	1	26.3	34.4	26.69%
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	533	546	2.41%	1	524	526	0.38%	1	645	635	1.56%	1	655	630	3.89%
Alkalinity, Carbonate (as CaCO3)	mg/L	1	51	56.2	9.70%	1	123	115	6.72%	1	101	110	8.53%	1	52.5	68.7	26.73%
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA	1	<1.0	<1.0	NA
Ammonia, Total (as N)	mg/L	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	0.138	0.137	NA	0.05	0.332	0.294	12.14%
Carbon, Total Organic	mg/L	0.5	8.94	8.83	1.24%	0.5	8.41	8.8	4.53%	0.5	16.4	16.1	1.85%	0.5	24.7	23.2	6.26%
Carbon, Dissolved Organic	mg/L	0.5	6.03	6.66	9.93%	0.5	7.72	7.5	2.89%	0.5	15.6	15.7	0.64%	0.5	15	18.7	21.96%
Chemical Oxygen Demand	mg/L	20	25	29	NA	20	31	35	NA	20	36	42	NA	20	47	48	NA
Nitrogen, Total Kjeldahl	mg/L	0.05	1.59	1.56	1.90%	0.05	1.03	1.1	6.57%	0.05	1.43	1.62	12.46%	0.05	1.61	1.63	1.23%
Phosphorus, Total (as P)	mg/L	0.005	0.121	0.127	4.84%	0.005	0.2	0.197	1.51%	0.005	0.427	0.453	5.91%	0.005	0.541	0.534	1.30%
Solids, Total Dissolved	mg/L	150	1030	1050	1.92%	150	1210	1170	3.36%	150	2370	2380	0.42%	150	2630	2370	10.40%
pH	pH units	0.1	8.51	8.52	0.12%	0.1	8.69	8.67	0.23%	0.1	8.55	8.56	0.12%	0.1	8.42	8.46	0.47%
Conductivity (EC)	uS/cm	2	1800	1800	0.00%	2	1870	1860	0.54%	2	3200	3170	0.94%	2	3380	3380	0.00%
Coliforms, Total (Q-Tray)	MPN/100 mL	1	23	23	0.00%	1	1050	548	62.83%	1	> 2420	> 2420	NA	1	3650	2450	39.34%
Coliforms, Fecal (Q-Tray)	MPN/100 mL	1	8	2	NA	1	37	47	23.81%	1	138	140	1.44%	1	326	210	43.28%
Mercury, total	mg/L	0.00001	<0.000010	<0.000010	NA	0.00001	<0.000010	<0.000010	NA	0.00001	<0.000010	<0.000010	NA	0.00001	<0.000010	<0.000010	NA
Aluminum, total	ug/L	10	86.5	50.3	52.92%	10	13.4	15.4	NA	10	107	98.6	8.17%	10	97.7	92.4	5.58%
Antimony, total	ug/L	0.25	<0.250	<0.250	NA	0.05	0.107	0.131	NA	0.05	0.233	0.229	NA	0.05	0.227	0.263	NA
Arsenic, total	ug/L	0.25	0.699	0.648	NA	0.05	1.59	1.72	7.85%	0.05	4.41	4.38	0.68%	0.05	4.78	4.77	0.21%
Barium, total	ug/L	0.5	104	105	0.96%	0.1	71.7	74.6	3.96%	0.1	63.1	62.3	1.28%	0.1	71.3	72.5	1.67%
Beryllium, total	ug/L	0.05	<0.050	<0.050	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.020	<0.020	NA
Bismuth, total	ug/L	0.05	<0.050	<0.050	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.020	<0.020	NA
Boron, total	ug/L	10	30.1	27.7	NA	10	35.7	35.6	NA	10	41.6	41.4	NA	10	43.9	44.2	NA
Cadmium, total	ug/L	0.01	<0.0100	<0.0100	NA	0.002	<0.0060	<0.0060	NA	0.002	0.0064	0.0058	NA	0.002	<0.0080	<0.0080	NA
Calcium, total	ug/L	250	42600	43100	1.17%	100	47500	48600	2.29%	250	85200	84600	0.71%	100	94600	93100	1.60%
Chromium, total	ug/L	0.5	0.78	0.77	NA	0.1	0.27	0.22	NA	0.1	0.42	0.41	NA	0.1	0.45	0.54	NA
Cobalt, total	ug/L	0.025	0.147	0.162	9.71%	0.005	0.161	0.167	3.66%	0.005	0.64	0.621	3.01%	0.005	0.636	0.648	1.87%
Copper, total	ug/L	1	<1.00	<1.00	NA	0.2	0.56	0.6	NA	0.2	1.07	1.03	3.81%	0.2	0.85	0.81	NA
Iron, total	ug/L	10	76.7	69.9	9.28%	10	16.6	18.5	NA	10	141	135	4.35%	10	151	148	2.01%
Lead, total	ug/L	0.25	<0.250	<0.250	NA	0.05	0.066	0.074	NA	0.05	0.099	0.094	NA	0.05	0.106	0.112	NA
Lithium, total	ug/L	0.25	28.7	30.2	5.09%	0.05	27.8	28.1	1.07%	0.05	29.3	30.5	4.01%	0.05	28.6	28.7	0.35%
Magnesium, total	ug/L	25	132000	135000	2.25%	10	123000	122000	0.82%	25	206000	202000	1.96%	10	250000	253000	1.19%
Manganese, total	ug/L	0.25	48.3	49.1	1.64%	0.05	45.6	46.7	2.38%	0.05	101	101	0.00%	0.05	161	161	0.00%
Molybdenum, total	ug/L	0.05	12.3	12.6	2.41%	0.01	15.6	16.5	5.61%	0.01	14.6	14.5	0.69%	0.01	13.3	13.5	1.49%
Nickel, total	ug/L	0.2	1.04	1.24	17.54%	0.04	1.22	1.29	5.58%	0.04	2.91	3.04	4.37%	0.04	3.33	3.65	9.17%
Phosphorus, total	ug/L	100	112	81	NA	10	195	189	3.13%	10	383	401	4.59%	10	625	606	3.09%
Potassium, total	ug/L	100	11000	11400	3.57%	100	10700	11200	4.57%	100	16800	16600	1.20%	100	16900	17100	1.18%
Selenium, total	ug/L	0.5	0.8	0.72	NA	0.1	0.69	0.74	6.99%	0.1	0.9	0.88	2.25%	0.1	0.85	0.84	1.18%
Silicon, total	ug/L	1000	1710	1680	NA	100	5350	5480	2.40%	100	8520	8600	0.93%	100	8440	8100	4.11%
Silver, total	ug/L	0.05	<0.050	<0.050	NA	0.01	<0.010	<0.010	NA	0.01	<0.010	<0.010	NA	0.01	<0.020	<0.020	NA
Sodium, total	ug/L	100	173000	177000	2.29%	100	165000	164000	0.61%	100	361000	365000	1.10%	100	448000	454000	1.33%
Strontium, total	ug/L	0.5	3030	3150	3.88%	0.1	2980	3190	6.81%	0.1	5380	5340	0.75%	0.1	5900	6030	2.18%
Sulfur, total	ug/L	10000	66800	68100	1.93%	1000	78800	82800	4.95%	1000	295000	297000	0.68%	1000	374000	361000	3.54%
Tellurium, total	ug/L	0.25	<0.250	<0.250	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.100	<0.100	NA
Thallium, total	ug/L	0.02	<0.0200	<0.0200	NA	0.004	<0.0040	<0.0040	NA	0.004	<0.0040	<0.0040	NA	0.004	<0.0080	<0.0080	NA
Thorium, total	ug/L	0.05	<0.050	<0.050	NA	0.01	<0.010	<0.010	NA	0.01	0.024	0.022	<0.010	0.01	<0.020	<0.020	NA
Tin, total	ug/L	0.25	<0.250	<0.250	NA	0.05	<0.050	<0.050	NA	0.05	<0.050	<0.050	NA	0.05	<0.100	<0.100	NA
Titanium, total	ug/L	1	2.6	2.67	NA	0.2	0.61	0.71	NA	0.2	5.93	5.46	8.25%	0.2	5.27	5.3	0.57%
Tungsten, total	ug/L	1	<1.00	<1.00	NA	0.2	<0.20	<0.20	NA	0.2	0.22	0.22	NA	0.2	<0.40	<0.40	NA
Uranium, total	ug/L	0.005	20.3	21.5	5.74%	0.001	24.3	26.2	7.52%	0.001	47.6	47.4	0.42%	0.001	53.5	54.8	2.40%
Vanadium, total	ug/L	1	4.28	4.16	NA	1	2.35	2.44	NA	1	5.14	5.07	1.37%	1	5.04	4.95	NA
Zinc, total	ug/L	10	<5.0	<5.0	NA	1	1.3	1.4	NA	1	1.1	<1.0	NA	1	<2.0	<2.0	NA
Zirconium, total	ug/L	0.1	0.142	0.109	NA	0.02	0.151	0.164	8.25%	0.02	0.594	0.613	3.15%	0.02	0.57	0.594	4.12%

Table 3: Summary of Leachate QA/QC Data

SAMPLE ID Parameter	Units	RDL	P2A2 Leachate MH (Q1)	DUP 1 (Q1)	Relative Percent	RDL	N Pumphouse MH (Q2)	DUP 1 (Q2)	Relative Percent	RDL	S Leachate Wet Well (Q3)	DUP 1 (Q3)	Relative Percent	RDL	N Pumphouse MH (Q4)	DUP 1 (Q4)	Relative Percent
Bromide	mg/L	1	1.51		NA	1	1.1		NA	1	2.24		NA	1	1.75		NA
Chloride	mg/L	10	934		NA	10	540		NA	10	859		NA	10	439		NA
Fluoride	mg/L	1	<1.00		NA	1	<1.00		NA	1	<1.00		NA	1	<1.00		NA
Nitrate (as N)	mg/L	0.1	7.7		NA	0.1	<0.100		NA	0.1	<0.100		NA	0.1	<0.100		NA
Nitrite (as N)	mg/L	0.1	0.29		NA	0.1	<0.100		NA	0.1	8.19		NA	0.1	<0.100		NA
Phosphate (as P)	mg/L	0.05	<0.0500		NA	0.05	0.387		NA	0.05	2.87		NA	0.05	0.189		NA
Sulfate	mg/L	10	410		NA	10	1330		NA	10	1820		NA	10	754		NA
VHw (6-10)	ug/L	100	<100	<100	NA	100	108	<100	NA	100	<400		NA	210	<210	<210	NA
VPW	ug/L	100	<100	<100	NA	100	<100	<100	NA	100	<400		NA	210	<210	<210	NA
EPHw10-19	ug/L	250	1600		NA	250	821		NA	250	<2500		NA	250	472		NA
EPHw19-32	ug/L	250	16400		NA	250	1210		NA	250	<2500		NA	250	251		NA
LEPHw	ug/L	250	1600		NA	250	810		NA	250	<2500		NA	250	470		NA
HEPHw	ug/L	250	16400		NA	250	1210		NA	250	<2500		NA	250	251		NA
Hardness, Total (as CaCO3)	mg/L	12.5	2100		NA	0.25	1270		NA	1.25	995		NA	0.625	952		NA
Mercury, dissolved	mg/L	0.00002	<0.000020		NA	0.00004	<0.000040		NA	0.00001	<0.000010		NA	0.00001	<0.000010		NA
Aluminum, dissolved	ug/L	100	264		NA	2	72.2		NA	10	100		NA	10	53.7		NA
Antimony, dissolved	ug/L	5	<5.00		NA	0.25	10.1		NA	0.5	30.8		NA	0.25	16.6		NA
Arsenic, dissolved	ug/L	5	73.7		NA	0.1	24.8		NA	0.5	65.2		NA	0.25	36.1		NA
Barium, dissolved	ug/L	10	2060		NA	0.5	156		NA	1	112		NA	0.5	128		NA
Beryllium, dissolved	ug/L	1	<1.00		NA	0.05	<0.050		NA	0.1	<0.100		NA	0.05	<0.050		NA
Bismuth, dissolved	ug/L	1	<1.00		NA	0.05	<0.050		NA	0.1	<0.100		NA	0.05	<0.050		NA
Boron, dissolved	ug/L	200	3870		NA	10	1650		NA	20	1770		NA	10	947		NA
Cadmium, dissolved	ug/L	0.2	<0.200		NA	0.01	<0.0100		NA	0.02	<0.0200		NA	0.01	<0.0100		NA
Calcium, dissolved	ug/L	5000	146000		NA	100	81200		NA	500	71600		NA	250	71500		NA
Chromium, dissolved	ug/L	10	17.1		NA	0.5	14.1		NA	1	32.7		NA	0.5	14.5		NA
Cobalt, dissolved	ug/L	0.5	40.8		NA	0.025	4.64		NA	0.05	3.9		NA	0.025	2.32		NA
Copper, dissolved	ug/L	10	<10.0		NA	0.5	<0.50		NA	1	<1.00		NA	0.5	<0.50		NA
Iron, dissolved	ug/L	200	13600		NA	10	28		NA	20	23.7		NA	10	28.8		NA
Lead, dissolved	ug/L	5	<5.00		NA	0.25	<0.250		NA	0.5	<0.500		NA	0.25	<0.250		NA
Lithium, dissolved	ug/L	5	42.3		NA	0.25	63.2		NA	0.5	62.7		NA	0.25	55.6		NA
Magnesium, dissolved	ug/L	500	422000		NA	25	259000		NA	50	198000		NA	25	188000		NA
Manganese, dissolved	ug/L	5	369		NA	0.1	311		NA	0.5	104		NA	0.25	106		NA
Molybdenum, dissolved	ug/L	1	31.2		NA	0.05	2.96		NA	0.1	2.97		NA	0.05	11.4		NA
Nickel, dissolved	ug/L	4	201		NA	0.08	16.3		NA	0.4	18.8		NA	0.2	10.7		NA
Phosphorus, dissolved	ug/L	1000	1480		NA	50	4040		NA	100	5940		NA	100	2570		NA
Potassium, dissolved	ug/L	2000	221000		NA	100	167000		NA	200	192000		NA	100	105000		NA
Selenium, dissolved	ug/L	10	<10.0		NA	0.5	1.91		NA	1	<1.00		NA	0.5	2.4		NA
Silicon, dissolved	ug/L	10000	21400		NA	500	12600		NA	1000	10200		NA	1000	11200		NA
Silver, dissolved	ug/L	1	<1.00		NA	0.05	<0.050		NA	0.1	<0.100		NA	0.05	<0.050		NA
Sodium, dissolved	ug/L	2000	1120000		NA	100	1770000		NA	200	2630000		NA	100	1490000		NA
Strontium, dissolved	ug/L	10	6430		NA	0.5	3220		NA	1	2140		NA	0.5	3280		NA
Sulfur, dissolved	ug/L	100000	170000		NA	5000	490000		NA	10000	566000		NA	10000	357000		NA
Tellurium, dissolved	ug/L	5	<5.00		NA	0.25	<0.250		NA	0.5	<0.500		NA	0.25	<0.250		NA
Thallium, dissolved	ug/L	0.4	<0.400		NA	0.02	<0.0200		NA	0.04	<0.0400		NA	0.02	<0.0200		NA
Thorium, dissolved	ug/L	1	<1.00		NA	0.05	<0.050		NA	0.1	<0.100		NA	0.05	<0.050		NA
Tin, dissolved	ug/L	5	<5.00		NA	0.25	7.79		NA	0.5	93.7		NA	0.25	27.4		NA
Titanium, dissolved	ug/L	20	<20.0		NA	1	31.1		NA	2	53.6		NA	1	27.9		NA
Tungsten, dissolved	ug/L	20	<20.0		NA	1	2.42		NA	2	4.18		NA	1	1.93		NA
Uranium, dissolved	ug/L	0.1	22.5		NA	0.005	16.9		NA	0.01	10.5		NA	0.005	32.2		NA
Vanadium, dissolved	ug/L	20	<20.0		NA	5	9.55		NA	10	11.1		NA	10	7.13		NA
Zinc, dissolved	ug/L	100	<100		NA	2	<5.0		NA	10	<10.0		NA	10	<5.0		NA
Zirconium, dissolved	ug/L	2	86.9		NA	0.1	18.3		NA	0.2	31.7		NA	0.1	16.1		NA
Alkalinity, Total (as CaCO3)	mg/L	1	2450		NA	1	3470		NA	1	6400		NA	1	2290		NA
Alkalinity, Phenolphthalein (as CaCO3)	mg/L	1	<1.0		NA	1	<1.0		NA	1	529		NA	1	35.2		NA
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	2450		NA	1	3470		NA	1	5340		NA	1	2220		NA
Alkalinity, Carbonate (as CaCO3)	mg/L	1	<1.0		NA	1	<1.0		NA	1	1060		NA	1	70.4		NA
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	<1.0		NA	1	<1.0		NA	1	<1.0		NA	1	<1.0		NA
Ammonia, Total (as N)	mg/L	1.25	69.8	73.4	5.03%	0.5	44.2	42.9	2.99%	0.5	69.3	67.5	2.63%	0.5	23.3	24	2.96%
BOD, 5-day	mg/L	270	2520		NA	146	> 400		NA	169	295		NA	113	67.7		NA
Carbon, Dissolved Organic	mg/L	25	112		NA	25	112		NA	25	153	143	6.76%	25	76.1	74.7	NA
Chemical Oxygen Demand	mg/L	200	4100	7800	62.18%	20	1680	1090	42.60%	20	844	658	24.77%	100	240	208	NA
Phosphorus, Total (as P)	mg/L	1	85.8	175	68.40%	0.1	5.18	4.47	14.72%	0.1	6	6.48	7.69%	0.1	2.27	2.37	4.31%
Solids, Total Dissolved	mg/L	150	4200		NA	150	6250		NA	150	10500		NA	150	4310		NA
Sulfide, Total	mg/L	2	29.8	1280	190.90%	0.02	49.5	52.2	5.31%	0.4	179	186	3.84%	0.02	32.5	35.4	8.54%
pH	pH units	0.1	7.9		NA	0.1	8.1		NA	0.1	8.55		NA	0.1	8.37		NA
Conductivity (EC)	uS/cm	2	7840		NA				NA				NA				NA
Acenaphthene	ug/L	0.05	0.193		NA	0.05	1.59		NA	0.05	<0.500		NA	0.05	0.062		NA
Acenaphthylene	ug/L	0.2	<0.200		NA	0.2	<0.200		NA	0.2	<2.00		NA	0.2	<0.200		NA
Acridine	ug/L	0.05	0.414		NA	0.05	0.283		NA	0.05	<0.500		NA	0.05	<0.050		NA
Anthracene	ug/L	0.01	<0.010		NA	0.01	<0.414		NA	0.01	<0.100		NA	0.01	<0.010		NA
Benz(a)anthracene	ug/L	0.071	<0.071		NA	0.01	0.163		NA	0.01	<0.100		NA	0.01	<0.010		NA
Benzo(a)pyrene	ug/L	0.01	<0.010		NA	0.01	0.017		NA	0.01	<0.100		NA	0.01	<0.010		NA
Benzo(b+j)fluoranthene	ug/L	0.398	<0.398		NA	0.05	<0.050		NA	0.05	<0.500		NA	0.05	<0.050		NA
Benzo(g,h,i)perylene	ug/L	0.05	<0.050		NA	0.05	<0.050		NA	0.05	<0.500		NA	0.05	<0.050		NA
Benzo(k)fluoranthene	ug/L	0.055	<0.055		NA	0.05	<0.050		NA	0.05	<0.500		NA	0.05	<0.050		NA
2-Chloronaphthalene	ug/L	0.1	<0.100		NA	0.1	<0.100		NA	0.1	<1.00		NA	0.1	<0.100		NA
Chrysene	ug/L	0.241	<0.241		NA	0.05	0.177		NA	0.05	<0.500		NA	0.05	<0.050		NA
Dibenz(a,h)anthracene	ug/L	0.01	<0.010		NA	0.01	<0.010		NA	0.01	<0.100		NA	0.01	<0.010		NA
Fluoranthene	ug/L	0.03	0.079		NA	0.03	0.422		NA	0.03	<0.300		NA	0.03	<0.030		NA
Fluorene	ug/L	0.05	0.111		NA	0.05	1.2		NA	0.05	<0.500		NA	0.05	0.062		NA
Indeno(1,2,3-cd)pyrene	ug/L	0.05	<0.050		NA	0.05	<0.050		NA	0.05	<0.500		NA	0.05	<0.050		NA
1-Methylnaphthalene	ug/L	0.1	0.297		NA	0.1	1.5		NA	0.1	<1.00		NA	0.1	0.264		NA
2-Methylnaphthalene	ug/L	0.1	0.291		NA	0.1	0.524		NA	0.1	<1.00		NA	0.1	<0.100		NA
Naphthalene	ug/L	0.2	0.928		NA	0.2	5.27		NA	0.2	6.27		NA	0.2	1.65		NA
Phenanthrene	ug/L	0.1	0.184		NA	0.1	3.07		NA	0.1	<1.00		NA	0.1	<0.100		NA
Pyrene	ug/L	0.02	<0.020		NA	0.02	<0.020		NA	0.02	<0.200		NA	0.02	<0.020		NA
Quinoline	ug/L	0.371	<0.371		NA	0.05	<0.050		NA	0.05	<0.500		NA	0.05	<0.050		NA
Acetic Acid	mg/L	3	<3.0		NA	3	<3.0		NA	3	<3.0	<3.0	NA	3	<3.0		NA
Butyric Acid	mg/L	2	<2.0		NA	2	<2.0		NA	2	<2.0	<2.0	NA	2	<2.0		NA
Caproic Acid	mg/L	2	<2.0		NA	2	<2.0		NA	2	<2.0	<2.0	NA	2			