2024 Annual Monitoring Report

Kitchener Park Landfill, City of Orillia, Ontario

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Distribution List

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1.0 INTRODUCTION

1.1 Background and Scope

WSP Canada Inc. (WSP) was retained by the City of Orillia (the City) to undertake a groundwater and surface water sampling program at the Kitchener Park Landfill (hereafter referred to as KPL or "the Site") for the 2024 monitoring period. Groundwater flow, groundwater and surface water quality and landfill gas (LFG) monitoring are discussed relative to the impacts of the KPL on the local water resources and adjacent properties. This monitoring program is completed by the City as part of their overall environmental monitoring objectives.

The KPL is a closed landfill located in the south part of the City and presently the site of a recreational park, located at 25 Kitchener Street (Figure 1). The KPL is accessed off Kitchener Street, on the south end of West Street. The landfill is bound by Kitchener Street to the north, West Street South to the east, Lake Simcoe to the south and wetlands and Ben's Ditch to the west (Figure 2).

The KPL is located on lands reportedly acquired by the City in 1909 and covers an area of approximately 26.6 acres. The landfill was closed in 1967 and is referred to in the Ontario Ministry of the Environment, Conservation and Parks (Ministry, or MECP and precursors) Waste Site Inventory as Site No. X 4110. As the landfill was closed prior to 1973, it is not regulated under the Waste Certificate of Approval / Environmental Compliance Approval process. Construction of a LFG control system was completed north of the landfill in 2020; monitoring of the system began in 2021. The system is permitted and operated under an Air & Noise Environmental Compliance Approval (No. 5412-BE7KES, Appendix E).

City records indicate that the landfill was active between 1943 and 1967. The waste is reported to have consisted of:

- **60% domestic waste** - including cinders, clinkers, house offal, broken crockery, old tins and metals, weeds, clothing, boots, straw, etc.;
- **15% commercial waste** - including similar materials as in domestic waste but sourced from commercial properties;
- **18% industrial waste** - including, but not limited to, foundry sand, catch basin waste, metal waste, crating and associated materials, building materials and demolition waste, and brush and tree waste; and,
- **7% other waste** - includes tree brush and debris.

This annual monitoring report provides a review of the performance of the KPL relative to the City's objectives regarding environmental management. City of Orillia staff conducted the surface and groundwater sampling. WSP staff conducted the LFG monitoring.

The Ministry's *Monitoring and Screening Checklist (Appendix D)* is included as Appendix E.

2.0 PHYSICAL SETTING

2.1 Landfill, Control Systems and Sewage Lagoon

The inferred limit of waste shown on Figure 2 was estimated based on the surface geophysical survey and geoprobe borehole transects as reported in Golder (2011). A 30 m setback was reported to have been maintained between the waste placement (waste fill) area and the shorelines of Lake Simcoe and Ben's Ditch. Cover material was reported to consist of sandy loam and fill materials from various municipal projects. In 2024, there were no reported indications of visible seepage from the landfilling area reaching either Lake Simcoe or Ben's Ditch.

The waste/cover fill at the KPL ranges in thickness from approximately 1 m to 4 m. The interpreted thickness of the final cover ranges from approximately 1 m at OW7 in the north, to 1.4 m at OW6 in the central landfill area. Waste materials were reported by the City to have been observed at shallow depths (less than 20 cm) during historic construction activities along the shoreline. The waste materials consist largely of wood, metal, plastic, glass, construction materials and newspaper, as identified through borehole and linear transect investigations completed in earlier studies (Golder, 2011). Newspaper fragments dating to 1959 were identified in the central part of the waste fill. No hazardous materials or materials inconsistent with historical records of accepted waste types were identified.

A LFG barrier and venting system was constructed at the north side of the Site in 2020. The design and operation of this system is outlined in Section 7.2.

The area to the west of the KPL includes the Orillia Wastewater Treatment Centre (WWTC) and lagoons. The area in the vicinity of the WWTC is known to contain fill materials, including some waste fill, as identified in the log at BH28-II, and also during recent (2015) excavations completed in the area of the WWTC lagoons as part of liner installation. The fill is described as sand and gravel with some silt with the presence of glass, metal plastic, cloth and newspaper. According to City staff the wastewater storage lagoons were not lined prior to 1992. In 1992 the lagoons were drained and the pond bases were lined with 8 inches of a clayey soils; the sideslopes of the ponds were not lined. It is expected that seepage from the lagoons has affected groundwater quality downgradient. The City reconstructed the storage lagoons in 2015, which included the installation of a geosynthetic liner consisting of ethylene propylene diene monomer (EPDM). The installation of the liner was expected to limit further contribution from the lagoons to the groundwater however, in the short-term, some ongoing contribution to groundwater quality impact is expected from material present within the underlying soils. Additionally, in 2021, major repairs at the WWTC of the north lagoon liner were undertaken to repair significant liner damage, which occurred during biosolids removal operations. Sludge found under the liner during the repairs was removed and the remedial work was completed by November 2021.

2.2 Land Use

Residential development is present to the east of the KPL, whereas commercial, industrial and institutional lands are located immediately north of Kitchener Street. Ben's Ditch and the Kitchener Street Waste Diversion Site (WDS) are located to the west. Ben's Ditch is located west of the Site and Lake Simcoe (Shingle Bay) is located to the south.

Kitchener Park has been converted to a multi-purpose outdoor recreation facility. There are two buildings at the park, a storage building and a utility building. The storage building, located in the southeastern portion, is used by the local Horseshoe Club. The original storage building was torn down in 2017 and replaced with a pre-cast concrete Newmarket Model 50 utility/storage vault. The new storage building was constructed with a sub-slab venting system. Power is provided by Hydro One via underground lines; no buried conduits enter the buildings.

The utility building contains a snack bar, a kitchen, maintenance rooms and public washroom, was constructed in 2011 and is located in the central portion of the Site. The building has a footprint of approximately 200 m^2 and is constructed with slab-on-grade foundations built of block and a mixed metal with concrete exterior. The building is serviced by municipal water and sewer from Kitchener Street.

The remainder of the park is developed with sports fields and a 2.4-acre leash-free dog park. Sports fields include: two full sized football / soccer fields; two baseball diamonds; four mini soccer fields; four tennis courts; playground equipment; a horseshoe pit; and a basketball court. A large gravel parking lot is located south of Kitchener Street; two driveways lead into the Site from Kitchener Street. An additional gravel parking lot is located on the eastern boundary of the site adjacent to West Street South.

2.3 Physiography and Drainage

The topography is relatively flat, with an overall gentle slope towards Lake Simcoe; the elevation is approximately 223 metres above sea level (masl) at its highest point to the northwest along Kitchener Street (at the main parking lot) and lowest along the lake shoreline at an approximate elevation of 219 masl (Figure 2).

A discontinuous drainage ditch runs along portions of the northern and eastern park boundaries (Figures 3 and 4). These ditches are typically 1 m to 2 m wide and 0.5 m to 1 m deep. Surface water runoff is interpreted to flow towards the ditches on the northern and eastern boundaries towards Lake Simcoe to the south. A component flows to Ben's Ditch and the intervening wetlands to the west. To the west, Ben's Ditch widens as it approaches Lake Simcoe. It is noted that the WWTC discharges to Ben's Ditch upstream of the KPL.

2.4 Geology

The overburden consists of Quaternary age materials, presumably deposited during the Wisconsinan Glaciation, overlying Palaeozoic carbonate bedrock. The bedrock lies more than 10 metres below ground surface (mbgs) and does not outcrop in the vicinity. Three geologic cross-sections of overburden materials at the Site are provided (Figures 3, 4 and 5). Cross-section locations are shown on Figure 2. Hydrogeological symbols used on the cross-sections are provided on Figure 6.

The surficial material on lands surrounding the wetlands at the Site are comprised primarily of glaciolacustrine silt and clay to the east and glaciolacustrine sands to the west, between the till ridges (Finnemore and Bajc, 1984).

The bedrock surface in the area consists of fine to coarse-grained fossiliferous limestone. This bedrock forms the upper member of the Bobcaygeon Formation, which is of Ordovician age. A local bedrock high is present near Kitchener Park; however, this was not intersected at any of the KPL monitoring wells.

2.5 Hydrogeology

Figures 3, 4 and 5 illustrate the hydrostratigraphy in the area of the park, including Ben's Ditch and the WDS to the west. The stratigraphy consists of an upper unconfined peat/Sand Aquifer underlain by a discontinuous lacustrine clay and silt confining layer, which is further underlain by a lower Sand Aquifer and a lower confining till layer.

The upper aquifer is characterized by (i) a peat unit found predominantly in the western part of the park at monitoring well OW1, near OW6 in the centre of the KPL and along the eastern boundary at OW5, (ii) a sand deposit found in the vicinity of Lake Simcoe (OW2, OW4) and (iii) silty sand at GP-KP4. Where present, the thickness of the peat ranges from approximately 0.75 m (OW5) to 2 m (OW1). The sandy units also range in thickness from approximately 0.75 m to 2 m. The discontinuity in the peat unit distribution to the north (e.g., GP-KP2, GP-KP7 and GP-KP8) is likely due to removal of this material prior to waste placement and

subsequent construction activities. The upper aquifer and the hydraulically connected materials above the upper confining layer (i.e., waste and fill) pinch out to the northeast at GP-KP3.

Fill and waste overlie the peat unit in some areas or in some cases (i.e., at OW7, OW3, OW8, BH28, GP-KP7, GP-KP8 and GP-KP2) comprise the entire thickness above the underlying confining unit (or where absent (e.g., OW7) the Sand Aquifer. The thickness of the overburden, fill and waste materials comprising the upper aquifer is highly variable across the surrounding area.

The upper confining layer consists of moist, grey, silty clay to clayey silt and has a thickness ranging from a low of less than 1 m at OW2 to a high of approximately 3 m at the most easterly well, OW5. The upper confining layer pinches out towards the north and is not observed at OW7, GP-KP7, GP-KP8, GP-KP2 or GP-KP3. It is possible that the confining layer material to the north was removed during landfilling and road construction activities. The upper confining layer is interpreted to exist under the location of Ben's Ditch, which would limit hydraulic interaction of this water body with the confined Sand Aquifer.

The Sand Aquifer is comprised primarily of very fine to fine brown to grey sand, typically becoming finer with depth; however, coarser sand and gravel were observed at several locations (i.e., OW1, OW2, OW7 and OW9). The thickness of the Sand Aquifer ranges from approximately 2 m at OW5 to approximately 9 m at OW1 and OW2. The Sand Aquifer pinches out to the east and becomes siltier; it is not present in the northeast (i.e., at OW4 and OW5). This unit is unconfined in the area of OW7 and OW9 (i.e., near Kitchener Street) where the upper confining layer is absent and it is expected that this "window" where the upper unconfined and Sand Aquifer are directly connected extends towards the lagoons east of the WWTP.

The lower confining layer consists of a silty sand to sandy silt and gravel till, interpreted to extend to bedrock (Golder, 2005b). The top of this unit rises to the northeast where the Sand Aquifer thins out, and as a result, directly underlies the waste fill at GP-KP2 and GP-KP3.

The hydraulic conductivity estimates for each unit are summarized in Table 1. The highest hydraulic conductivity (2.1×10^{-3} cm/s) is associated with the sand in the unconfined upper aquifer (i.e., OW4-II and GP-KP4). Slightly lower hydraulic conductivities are observed within the peat (OW1-III, 1.0×10^{-4} cm/s).

The hydraulic conductivity of the confined Sand Aquifer ranges from 1.2×10^{-3} cm/s to 8.2×10^{-5} cm/s. The variation of two orders of magnitude represent two screened intervals, (i) the upper portion of the aquifer screened at OW2-II (hydraulic conductivity of 1.2×10^{-3} cm/s) consisting of medium sand and (ii) the base of the aquifer consisting of fine, poorly sorted sand and silt (OW1-1, 8.2×10^{-5} cm/s; OW2-II, 2.3×10^{-4} cm/s; and OW6-I, 2.2×10^{-4} cm/s).

The estimated hydraulic conductivity of the waste (1.5×10^{-4} cm/s to 8.0×10^{-5} cm/s) is similar to that of very fine sand or silty sand, reflecting the daily cover materials observed in the waste and the low degree of compaction typical of a small, thin landfill.

2.6 Water Use

As discussed in Dixon Hydrogeology (1995), a total of 11 private water supply wells are reported to be located within a one km radius of the KPL. The majority of these wells are installed in the bedrock underlying the till unit, including four wells reported to be constructed at or near Kitchener Park. Based on a 1996 survey by City staff, it was concluded that none of these recorded private water supply wells are currently in use. The City obtains its water supply from surface water (Lake Couchiching), two municipal groundwater supply wells located

approximately 2.5 km north of the park and a third well (the West Orillia Well), located approximately 2.1 km to the northwest.

3.0 MONITORING PROGRAM

The objectives of the annual water monitoring program are:

i) To assess the direction and rate of groundwater movement, as well as to monitor the height of the leachate mound within the landfill;

ii) To monitor leachate and groundwater quality in order to determine the impact of the landfill on the adjacent water bodies;

iii) To monitor the subsurface landfill gas concentrations and evaluate the migration of methane, notably to off-site receptors;

iv) To monitor the performance of the LFG management system; and,

v) To provide recommendations for changes in the monitoring program, as required.

The 2024 monitoring and reporting scope is based on the program outlined in WSP (2023) and included the following:

- Annual water quality sampling from a total of 16 groundwater/leachate observation wells at nine locations;
- Semi-annual water level monitoring from 18 groundwater/leachate observation wells and seven LFG monitoring wells;
- Semi-annual LFG monitoring at twelve LFG monitoring wells and three observation wells (OW3, OW6-II and OW8); and,

3.1 Monitoring Locations

The monitoring locations are shown on Figure 2. Construction details for groundwater monitoring locations at the KPL are provided in Table 2 and on Figures 3 through 5.

3.2 2024 Environmental Monitoring Program

The 2024 monitoring program consisted of one round of groundwater monitoring in September 2024. The schedule and parameter list are outlined in Table 3 and Table 4; water levels were measured semi-annually. All groundwater sampling and water level monitoring was carried out by City staff. Standard procedures for monitoring activities provided by the City of Orillia are included in Appendix D. The Procedures Document outlines methods of sample collection. The attached Procedures Document was developed for the Kitchener Street Waste Diversion Site (KWDS); however, methods are consistent with those used at the KPL.

Groundwater samples were collected by City personnel and analyzed for water quality parameter by Testmark Laboratories Ltd. (Testmark) of Mississauga, Ontario. Testmark is compliant with ISO/IEC 17025:2017 standards. The results are discussed in Section 5 and displayed in tabular format in Appendix B. Detection limits for the analyses were accordingly established to meet or exceed the PWQO.

Monitoring of soil-gas at all locations was carried out by WSP staff on February 26 and November 14, 2024. The monitoring program is shown in Table 4. A portable, high-volume pump (5 L/min) is used to purge three times the volume of each gas well prior to sampling. Readings including the relative concentrations of carbon dioxide (CO_2),

methane (CH_4), and oxygen (O_2) are recorded using a calibrated Landtec Gas Analyzer and Extraction Monitor (GEM 2000). The soil-gas probes are screened across the water table. Water levels are measured during each sampling round to confirm that the water level is below the top of the screen. The results of the soil-gas sampling are discussed in Section 7.0.

3.3 Quality Assurance / Quality Control Program (QA/QC)

The sampling program included collection of two sets of duplicate water samples (groundwater) that were submitted to Testmark. The duplicates were collected at monitoring wells OW4-I and OW2-IID. All duplicate water samples were analyzed for major ions, indicator parameters, metals, nutrients and Volatile Organic Compounds (VOC). Results of the QA/QC program are discussed in Section 5.8.

4.0 WATER LEVELS AND GROUNDWATER FLOW

Water levels were collected by the City prior to water quality sampling. Water level measurements and groundwater elevations are shown in Table 5. Water levels were collected by WSP at wells monitored during LFG monitoring to confirm water levels relative to the screened interval. Water levels collected during LFG monitoring are not summarized on Table 5 but are discussed as appropriate in Section 7.0.

Hydrographs of current and historical water level monitoring are contained in Appendix A. At all monitoring locations, water levels were typically highest during the spring (April 2024) and lowest during the fall (September 2024). In September 2024, the depth to water from surface ranged from approximately 0.26 mbgs near the shore of Lake Simcoe at OW1, to about 4.08 mbgs at OW7. The depth to water in September 2024 was approximately 1.27 mbgs (at OW6-II), where the central part of a mound is interpreted to be located.

In September 2024, vertical hydraulic gradients observed at monitoring wells with screens installed within the Sand Aquifer are slightly upward at OW2 (0.008 m/m). The hydraulic gradient observed at OW5, between the Sand Aquifer and the upper confining layer is also slightly upward (0.10 m/m). Similarly, the vertical gradient observed between the upper (unconfined) and lower Sand Aquifer at OW1 and OW4 was slightly upward in 2024 (0.010 to 0.012 m/m, respectively). A downward gradient was observed at OW6 between the waste and the Sand Aquifer (-0.31 m/m), at BH28 between the fill and the Sand Aquifer (-0.16 m/m) and at OW9 between the Sand Aquifer and the lower confining layer (-0.11 m/m).

The configuration of the water table is shown on Figure 7. The surface is based upon interpolation of September 2024 water levels at the shallowest screen at wells installed in the uppermost stratigraphic units and waste.

Groundwater flow within the upper hydrostratigraphic units roughly reflects topography, wherein a slightly elevated mound is located within the central landfill area where ground elevations are highest and decline toward the lake and the adjacent drainage swales. The shallow groundwater flow to the northeast and east is limited by the elevation of the till confining unit, which rises to the east (see Figures 3 and 5). A portion of the local radial groundwater flow also flows eastward towards West Street. The shallow groundwater water levels at OW5 indicate at the potentiometric surface of the shallow aquifer is below the invert of the ditch and therefore point-source leachate impacts in the ditches are not expected. City staff reported they have not observed evidence of leachate discharge (i.e., staining within the ditches, sheen, etc.) to the local ditches adjacent to Kitchener Park. Based on the topography east of the park it is inferred that groundwater flow east of the KPL will be largely southward towards Lake Simcoe.

Other wells in this area exhibited similar water levels to those observed in 2023 (see hydrographs in Appendix A). The estimated horizontal hydraulic gradient from OW6 to Lake Simcoe is estimated to be 0.002 m/m in 2024.

Groundwater flow direction within the underlying Sand Aquifer is interpreted to be generally towards the south, discharging to Lake Simcoe; as noted in Section 2, the confining layer under the area of Ben's Ditch is expected to limit direct interaction with the underlying aquifer. The estimated horizontal hydraulic gradient between OW6 and OW2 is 0.003 m/m based on groundwater levels in the aquifer at these locations in 2024. As noted in Section 2, it is interpreted that this aquifer is unconfined in the area of Kitchener Street and therefore recharge from surface is expected to influence flow in this area.

5.0 GROUNDWATER QUALITY

Lake Simcoe and Ben's Ditch are the receptors of flow from the KPL. As a result, water quality results are evaluated with respect to the PWQO rather than the ODWS, similar to the approach used for the WDS.

Water quality data for all analyses (major ions and indicators, nutrients, metals and VOC) are presented in Appendix B.

5.1 Background Water Quality

As waste or waste fill was detected in all wells north of the landfill, there is no "true" background well at this Site. As a proxy for a "true" background water quality location, monitoring locations BH1-III (peat) and BH1-I (Sand Aquifer) located north of Highway 12 and east of Ben's Ditch are included for comparison. These wells are considered to reflect background water quality north (upgradient) of the landfills to the south. The groundwater flow direction in the Sand Aquifer is generally southward towards Lake Simcoe. A summary of average background water quality for selected parameters is displayed in Table 6 (average from the WDS spring, summer and fall sampling events).

Background water quality in the peat (as determined by BH1-III) exhibits elevated concentrations of chloride, sodium, iron, manganese, dissolved organic carbon (DOC) and chemical oxygen demand (COD). The average 2024 concentrations of these parameters at BH1-III are: chloride (436 mg/L), sodium (227 mg/L), iron (2.69 mg/L), manganese (0.432 mg/L), DOC (51 mg/L) and COD (203 mg/L). Elevated concentrations of sodium and chloride at BH1-III are most likely due to road salting activities. In 2024, chloride (436 mg/L) and sodium (227 mg/L) concentrations monitored in background water quality in the Sand Aquifer at BH1-IR remain elevated but are lower than those reported in 2023 (337 mg/L and 144 mg/L, respectively). Low chloride and sodium concentrations were observed at this location prior to 2018 (3 mg/L and 28 mg/L, respectively in 2017), suggesting an increased source of road salt impacts to this area.

Ammonia concentrations monitored in background water quality in the peat at BH1-III were observed to be low, averaging of 0.25 mg/L. Total phosphorus concentrations increased slightly in 2024 averaging 2.54 mg/L, up from 2.25 mg/L in 2023. Ammonia monitored in background water quality in the Sand Aquifer at BH1-IR was also observed to be low, averaging 0.06 mg/L which declined slightly to that observed in 2023 (0.08 mg/L in 2023). Exceedances of the PWQO are typically observed at these locations for iron, phenols and phosphorous. The road salt impacts or natural presence of these parameters at elevated concentrations at these upgradient locations limits their usefulness as indicators of landfill impact.

5.2 Leachate Quality

Leachate quality at the KPL is assessed at OW3 and OW6-II. Table 7 presents the measured concentrations of selected leachate indicator parameters determined during the annual Fall 2024 sampling event; full analytical results are summarized in Appendix B and on Certificates of Analysis in Appendix C.

The concentrations of chloride (8.2 mg/L to 28.8 mg/L), sodium (21 mg/L to 30 mg/L) and DOC (14.7 mg/L to 14.9 mg/L) were relatively low in OW3 and OW6-II in comparison to “typical” landfill leachate, which is considered to reflect the age and possibly the nature of the waste. The concentrations of ammonia (14.9 mg/L to 24.8 mg/L) are low compared to typical leachate from younger and larger landfills but is sufficiently elevated to potentially result in an exceedance of the regulated standards for unionized ammonia (see Section 6) within groundwater discharging to the adjacent surface water body.

Phosphorous concentrations at OW3 (0.49 mg/L) and OW6-II (2.23 mg/L) are elevated relative to the PWQO of 0.02 mg/L. Phosphorous decreased at OW3 in 2024 (down from 0.91 mg/L in 2023 and was below the peak concentration of 8.71 mg/L in 2019). Phosphorous at OW6-II significantly decreased in comparison to the concentration reported in 2023 (3.7 mg/L). The iron concentrations at OW3 (44.7 mg/L) and at OW6-II (34.4 mg/L) are significantly elevated relative to the PWQO of 0.3 mg/L. Iron at OW3 significantly decreased in comparison to the concentration reported in 2023 (108 mg/L). Low concentrations of phenols were reported at both OW3 and OW6-II in 2024 1.5 µg/L and 2.5 µg/L, respectively.

Based on detections from sampling in 2010, two VOC were selected to act as indicator parameters for leachate from this landfill based on consistent concentrations and presence at both locations: monochlorobenzene and 1,4 dichlorobenzene. Monochlorobenzene (1.1 µg/L at OW3 and 7.8 µg/L at OW6-II) and 1,4-dichlorobenzene (0.5 µg/L at OW3 and 0.9 µg/L at OW6-II) were detected in 2024. These concentrations were less than the PWQO of 15 µg/L and 4 µg/L, respectively. The concentration of m,p-xylene (1,600 µg/L) at OW6-II reached a historical high in 2024, and exceeded the PWQO of 32 µg/L; the concentration increased in comparison to earlier results (1,130 µg/L in 2023, 1,284 µg/L in 2022, 1,000 µg/L in 2021 and 1,350 µg/L in 2019). No xylenes were detected at OW3 in 2024. Benzene was also detected at OW3 and OW6-II (0.3 and 1.1 µg/L, respectively); benzene at OW3 and OW6-II remains below the PWQO of 100 µg/L.

5.3 Unconfined Aquifer (Nearshore) Groundwater Quality

Shallow ground water quality in the unconfined aquifer is monitored at two locations: (i) at OW1-III along the southwestern park boundary adjacent to Ben’s Ditch and Lake Simcoe and (ii) at OW4-II adjacent to the Lake Simcoe shoreline. Water quality results for key indicator parameters are contained in Table 10.

Comparison of the results for OW1-III and OW4-II to background and leachate water quality indicates that these wells are influenced by landfill leachate; it is noted that indicator parameter concentrations in the shallow unit are less than those in the underlying Sand Aquifer. The reported concentration of ammonia at OW1-III is 2.51 mg/L; a concentration of 0.96 mg/L is reported for OW4-II. Ammonia concentrations in these wells remain below the historical high concentration reported in 2019 (12.7 mg/L at OW1-III). Iron is elevated, exceeding the PWQO of 0.3 mg/L (10.5 mg/L at OW1-III and 0.67 mg/L at OW4-II) and are similar to those reported in recent years. Total phosphorous concentrations at OW1-III (1.29 mg/L) and OW4-II (0.14 mg/L) are elevated relative to the PWQO of 0.02 mg/L; concentrations at OW1-III reached a new historical maximum (previous maximum 0.96 mg/L in 2021 and 2023); concentrations at OW4-II remained below the historical maximum of 0.81 mg/L in 2011. Detectable concentrations of phenols (greater than 0.002 mg/L) were reported at both OW1-III (0.002 mg/L) and OW4-II (0.002 mg/L); however, low concentrations of phenols at this Site are not considered to reflect impact from KPL.

VOC parameters detected at OW1-III in 2024 include benzene (2.0 µg/L), 1,4-dichlorobenzene (0.8 µg/L) monochlorobenzene (2.8 µg/L). No exceedances of the PWQO for VOC parameters were observed in the unconfined aquifer next to the lake. No VOC parameters were detected at OW4-II in 2024.

5.4 Sand Aquifer Water Quality

The groundwater quality within the Sand Aquifer is monitored at ten locations: OW1-I, OW1-II, OW2-I, OW2-II, OW4-I, OW5-I, OW6-I, OW7 and OW9-II. Observation well nests OW1, OW2 and OW4-I are downgradient of the landfill and adjacent to Lake Simcoe. OW5-I, OW7 and OW9-II are located on the north and east margins of the central groundwater mound, whereas OW6-I is screened below the waste in the central part of the Site. BH28-I is located west of the central groundwater mound. The water quality results at these locations are summarized in Table 9 for selected landfill leachate indicator parameters. In 2021, major repairs at the WWTC of the north lagoon liner were undertaken to repair significant liner damage, which occurred during biosolids removal operations. Sludge found under the liner during the repairs was removed and the remedial work was completed by November 2021. As noted below, it is considered possible that elevated ammonia at various locations downgradient of the WWTC could be in part associated with the liner damage.

Elevated chloride (46 mg/L to 114 mg/L) and sodium (29 mg/L to 176 mg/L) concentrations are observed in monitoring wells OW1-I, OW1-II, OW2-I and OW7. These ranges of concentration are similar to those observed in 2023 and are higher than those observed in the leachate. Elevated chloride and sodium were also detected at OW9-II where concentrations of 422 and 172 mg/L, respectively, were reported. These concentrations are higher than those observed in leachate and indicate influence from activities north of the Site (i.e., road salting, former snow storage and/or the WWTC). Decreasing trends in chloride concentrations were observed downgradient of the landfill at OW2-I and OW2-II and have stabilized in recent years. Decreasing trends in chloride concentrations at OW1-I and OW1-II have remained stable since 2018.

Ammonia concentrations are elevated at most locations in the Sand Aquifer, ranging up to 77.3 mg/L at OW9-I, where concentrations have declined since the well was installed in 2022. Elevated ammonia is observed both south of OW9 at OW1 where relatively stable concentrations are observed and at OW2-II, where an increasing observed since 2017 at OW2-II continues (31.9 mg/L). In the central part of the KPL, at OW6-I (30.1 mg/L), a decreasing trend of ammonia continues. Lower ammonia concentrations are observed at locations to the east (OW4 and OW5) and the deeper OW2-I, all less than 2 mg/L. Overall, it is concluded that ammonia in the Sand Aquifer originates from both the KPL leachate and contribution from the WWTC.

Elevated potassium accompanies elevated ammonia (up to a maximum concentration of 29 mg/L at OW6-I). It is noted that relatively elevated chloride (114 and 422 mg/L) and sodium (176 and 172 mg/L) concentrations are present at OW2-I and OW9-II, respectively, but is not accompanied by elevated ammonia or potassium at OW2-I or elevated ammonia at OW9-II. This suggests that these wells may be more impacted by road salt than by the wastewater lagoons.

Iron concentrations are notably elevated in the Sand Aquifer, ranging from 9.36 mg/L at OW2-I to 50.5 mg/L at OW2-II. The concentrations at most locations was consistent with those observed in 2023. Significant increases of iron were reported at some locations in 2023 (135 mg/L at OW4-I, and 29.5 mg/L at OW9-II) returned to earlier ranges, confirming the inaccuracy of the 2023 results.

The highest concentrations of iron are similar to or exceeded those measured in the leachate monitoring wells in 2024 (34.4 at OW6-II mg/L to 44.7 mg/L at OW3). Concentrations of iron downgradient of the landfill and adjacent to Lake Simcoe are highest at OW1-II and OW2-II (40.6 and 50.5 mg/L, respectively); the iron concentration at OW2-II decreased from the historical maximum reported in 2023 (58.5 mg/L), however the overall increasing trend observed since 2016 continues.

The elevated ammonia, potassium and iron concentrations at wells located in the Sand Aquifer are indicative of leachate; however, impacts are also observed northwest of the KPL due to the operation of the WWTC lagoons. The presence of these parameters is consistent with the key leachate indicators, as well as of the parameters expected to be in the WWTC lagoons to the northwest. It is noted that the highest concentrations are upgradient of the KPL at OW9-II. However, reported concentrations of ammonia, potassium, chloride, and various other parameters continue to increase at the downgradient location of OW2-II (31.9 mg/L ammonia compared to 30.1 mg/L at OW6-I and 14.9 mg/L at OW3 in the KPL). The elevated ammonia concentrations reported at OW2-II suggest that the WWTC lagoons continue to influence the groundwater quality in this area; the City notes that one unlined lagoon remains in operation at the south-east corner of the WWTC on an as-needed basis; this lagoon is used for decanting sewage impacted material. The lower concentrations at OW4-1 (and relatively low concentrations at OW4-II) indicate that the leachate strength is less in the eastern part of the landfill.

The concentrations of most metals detected at wells screened in the Sand Aquifer were below the PWQO, with the exceptions of iron (discussed above) and cobalt. In 2024 the copper concentration at OW9-II (15.9 µg/L) increased; concentrations exceeded the PWQO of 5 µg/L). Cobalt and phosphorous exceedances are summarized in Table 5.1.

Table 5.1: Cobalt and Phosphorous Exceedances in Sand Aquifer

Parameter	Cobalt (µg/L)	Phosphorus (mg/L)
PWQO	**0.9**	**0.02**
OW1-I	11.7	0.08
OW1-II	16.6	0.01
OW2-I	2.0	0.72
OW2-II	14.9	0.04
OW4-I	1.9	0.45
OW6-I	13.9	1.17
OW7	1.0	0.10
OW9-II	3.7	0.13

The range of concentrations of cobalt (1.0 µg/L to 16.6 µg/L) in the vicinity of the KPL are higher than the concentration reported at the upgradient background location (BH1-IR) in 2024 (1.2 µg/L). Similarly, the range of concentrations of phosphorus (0.01 mg/L to 1.17 mg/L) were slightly greater than the concentration reported at BH1-IR (0.22 mg/L). Phosphorus levels were slightly elevated at OW4-I (0.45 mg/L), similar to recent years, excluding the anomalous result reported in 2023 (22.7 mg/L). At other locations in the Sand Aquifer, the concentrations of cobalt and phosphorus were less than or similar compared to those reported in previous years, with the exception of the reported concentrations of cobalt and phosphorous from 2023 that were interpreted with caution in the context of the 2023 monitoring report.

VOC results are included in Table B1, attached in Appendix B. VOC samples were inadvertently missed from OW9-I and OW9-II. A number of VOC parameters were identified in the Sand Aquifer including benzene, monochlorobenzene, m,p-xylene, 1,4-dichlorobenzene and vinyl chloride at concentrations less than or similar to those in previous years. Concentrations of these VOC were typically less than 10 µg/L, with the exception of two parameters that were detected within the waste footprint, monochlorobenzene at OW6-II (7.8 µg/L); and m,p-xylene was detected at OW6-I (54.5 µg/L) and at OW6-II (1,600 µg/L).

Elevated parameters above their respective PWQO in 2024 included monochlorobenzene (21.2 µg/L, PWQO 15 µg/L) at OW6-I, m,p-xylene (54.5 and 1,600 µg/L, PWQO 32 µg/L) at OW6-I and OW6-II respectively, and 1,4-dichlorobenzene (5.5 and 5.8 µg/L, PWQO 4 µg/L) at OW1-I and OW1-II, respectively. No VOC exceedances of the PWQO were observed in the Sand Aquifer at OW1-II, OW2-I, OW2-II, OW4-I, or OW7. Overall, at least one VOC was observed at all locations in 2024 with the exception of OW4 indicating less of an influence on the east side of the landfill. Additionally, vinyl chloride was only observed near the western portion of the landfill at OW1 and OW2. The reportable VOC detections identified near the western portion of the KPL may be representative of impacts from the WWTC. The highest concentrations, notably monochlorobenzene and xylenes were observed at OW6 within the landfill footprint.

In 2024, The KPL is considered to be the source of some of the VOC (e.g., chlorobenzene and 1,4-dichlorobenzene) observed in the Sand Aquifer, whereas off-site sources (i.e., from industrial lands to the north of the Site) or spills may contribute to other VOC parameters.

5.5 Groundwater Quality in Fill Area West of KPL

Groundwater quality in the fill to the west of the KPL is monitored at two locations: OW8, BH28-I / BH28-II, located generally south of the WWTC. OW8 and BH28-II are screened within the fill, whereas BH28-I is screened in the Sand Aquifer. These locations are monitoring fill outside of the landfill limits. Average water quality results for key indicator parameters are contained in Table 8.

Iron concentrations at these locations west of the KPL were reported as 10.7, 36.2, and 1.87 mg/L at OW8, BH28-I and BH28-II in 2024, respectively. The concentration range in 2024 is similar to those observed in 2022; concentrations were 0.14, 41.2 and 21.9 mg/L OW8, BH28-I and BH28-II, respectively. It is noted an increasing iron trend was observed at BH28-I between 2003 and 2015 and BH28-II between 2003 and 2013, however had decreased at BH28-I and stabilized in recent years at BH28-II.

Water quality within the WWTC lagoons is monitored monthly by City staff during the spring, summer and fall. Prior to the installation of the lagoon liner in 2015, concentrations of ammonia in 2012 reported for each of the six storage lagoons ranged from 23 mg/L to 870 mg/L (average 454 mg/L). Given the location of the storage lagoons and the absence of a confining layer overlying the Sand Aquifer in the area of the Lagoons, it is considered likely that elevated ammonia observed under the western portion of the KPL has been influenced by exfiltration from the lagoons prior to 2015. It is noted that a higher ammonia concentration was observed in the shallowest unit at BH28-II (45.3 mg/L) and a lower concentration in the Sand Aquifer BH28-II (1.4 mg/L) south of the lagoons.

Water quality at BH28-II, located to the southwest of the lagoons, is depicted in graphs and tables as part of the 2024 Kitchener Street Waste Diversion Site monitoring report. This location also exhibits elevated ammonia; the concentrations decreased in 2024 (40.3 mg/L, down from 68.7 mg/L in 2023). A similar decrease was observed for phosphorous (5.07 mg/L, down from 10.6 mg/L in 2023). South of the lagoons, at OW8, ammonia concentrations have generally fluctuated since 2013 ranging from 7.74 mg/L in 2013 to 0.8 mg/L in 2019 and in 2024 remained within this range (3.78 mg/L). An increase in chloride in sodium concentrations has been observed since 2022 (26 and 32 mg/L, respectively) with chloride results increasing to 168 and 151 mg/L in 2023 and 2024, respectively, and sodium results increasing to 65 and 84 mg/L in 2023 and 2024, respectively. Increased chloride and sodium may reflect impact of road salting along Kitchener Street. As previously mentioned, major repairs of the north lagoon liner were undertaken in 2021. Sludge found under the liner during the repairs was removed and the remedial work was completed by November 2021. The elevated ammonia observed in the reported concentrations suggest the sludge found beneath the liner influenced water quality downgradient of the lagoons.

Ammonia concentrations increased slightly at BH28-I (3.9 mg/L, up from 2.6 mg/L in 2023, and 1.4 in 2022 and 2.0 mg/L in 2021, respectively). A declining trend was noted from 2014 to 2019 (14.1 mg/L in September 2014), however current concentrations appear to be fluctuating around 3 mg/L.

5.6 Water Quality Summary

The leachate from the KPL is characterized (at OW3 and OW6-II) by elevated concentrations of ammonia, COD, potassium and iron. The VOC parameters benzene, chlorobenzene, 1,4-dichlorobenzene and m,p-xylene have previously been observed in leachate from the KPL. It is noted that these three VOC parameters were observed in 2024. Chloride and sodium concentrations within the waste materials are relatively low (28.8 mg/L and 30 mg/L at OW3, 8.2 mg/L and 21 mg/L at OW6-II), reflecting the age of the waste and the small size of the landfill. Higher chloride concentrations in the deeper wells monitored in the area of the KPL may reflect impact of road salting along Kitchener Street and West Street, in addition to historic snow storage to the north of the WWTC. In 2024, water quality from west of the landfill and the fill area west of the KPL is characterized by relatively elevated concentrations of phosphorous and ammonia at OW9, OW8, BH28-I and BH28-II.

Samples collected from wells constructed within the lower Sand Aquifer reflect impact from the WWTC and landfill leachate. Iron, potassium, ammonia and total phosphorus concentrations in these wells are similar to those in the leachate. VOC are detected in the Sand Aquifer at concentrations similar to those in previous years. Stable or declining concentrations of most key indicator parameters are observed downgradient of the landfill, consistent with expected trends. An exception is noted for OW2-II, where increasing trends of ammonia, potassium, and iron

concentrations have been observed since 2017). Concentrations of iron and ammonia downgradient of the landfill and adjacent to Lake Simcoe are also elevated at OW1-II; the iron and ammonia concentrations at this location remain relatively stable and below the historical maxima reported in 2013. Landfill leachate impact was observed downgradient of the landfill in the unconfined aquifer monitoring well locations near the shoreline of Lake Simcoe (i.e., OW1-III and OW4-II) based on elevated concentrations of iron and ammonia. Ammonia decreased slightly at OW1-III (2.5 mg/L in 2024, down from 5.8 mg/L in 2023).

The presence of road salt related impacts (albeit declining) at many locations and the presence of elevated ammonia in the lower Sand Aquifer are considered to reflect the absence of the overlying confining layer to the north, as observed at OW7 and OW9-II. This absence of overlying confining layer also provides a higher permeability “window” where the impacts from the WWTC lagoons (prior to lining in 2015) and snow storage location could potentially enter the Sand Aquifer and move southerly towards OW1 and OW2.

5.7 Results of Quality Assurance/Quality Control

The objective of the QA/QC assessment was to evaluate the quality and appropriateness of the analytical data, particularly at concentrations that may be at, or near, decision-making criteria for the water monitoring program. This assessment does not include a review of laboratory duplicate samples that are part of the laboratory’s internal QA/QC standard program. Duplicate samples were collected for OW4-I and OW2-II (labelled as OW504-I and OW2-IID in Laboratory Analysis).

A comparison of the duplicate water quality data is outlined in Table 11. The relative percent difference (RPD) calculated for the duplicate samples, is included in this table. Ion balance error calculations are included in Appendix B.

Samples with RPD calculations over 25% are considered to be estimates only. As illustrated in Table 11, the lead, selenium, orthophosphate and phosphorous concentrations at OW4-I and lead, phosphorous and 1,4-dichlorobenzene concentrations at OW2-II should be considered approximate values. The highest RPD difference was noted for orthophosphate at OW4-I (80%) and results for this parameter, in addition to results for lead, selenium, phosphorous and 1,4-dichlorobenzene (all with RPD above 25% for one or both duplicates) should therefore be interpreted with caution. The number of parameters with RPD calculations above 25% is similar to previous years and is considered to be higher than typically accepted. Acceptable RPD values were calculated for all other parameters detected in the duplicate samples. Overall, review and comparison of the analytical results for samples and their duplicates indicates strong agreement for most key indicator parameters. The data are considered acceptable on this basis.

In order to evaluate the reliability of the analytical results, ion balance error percentages were calculated on the basis of major ion analysis. Ion balance error calculations are a measure of the electrical balance of the cations and anions in solution and provide an indication of the chemical stability of the sample. Ion balance error calculations are presented in Appendix B. A total of eight samples (of the 17 analyzed) exhibited a calculated ion balance error of less than 5%; One sample (out of 17) exhibited a calculated ion balance error of greater than 10%. A review of the major ion results indicate that for some samples, calcium and magnesium (notably OW4-I and 5-I) and in some cases alkalinity are notably outside of the expected trend for these parameters. Ion balance errors of 5% to 10% are considered acceptable for the purposes of this assessment. A total of 8 out of 17 analyzed samples met this criterion in 2024.

6.0 ENVIRONMENTAL CONDITION EVALUATION

Groundwater from the KPL discharges to Lake Simcoe within or adjacent to Kitchener Park; groundwater from the fill area west of the KPL discharges to Ben's Ditch and the area where it discharges to Lake Simcoe. There are no groundwater users within or downgradient, and as a result, the main concern is protection of aquatic life in the adjacent surface water bodies. The Provincial Water Quality Objectives (PWQO) are the relevant criteria for consideration however, these criteria apply to water bodies, rather than the groundwater at the nearshore areas.

Phosphorous concentrations and loading were previously assessed in the Kitchener Street Waste Diversion Site Assessment Update (Golder, 2011). The phosphorus loading was similar to the loading calculated for the WDS and substantially less than that from the Orillia WWTC. Given that the waste in the KPL is over 50 years old, the mass loading of landfill related parameters discharging to the lake is expected to decrease.

As described in the assessment of the potential effects of the KPL and WDS on the surface water (Golder, 2012b), the shoreline of Shingle Bay is active and potential impacts to the aquatic environment are largely limited to the potential for ammonia to limit the heath of benthic species within the nearshore substrate. Whereas the limiting concentration for groundwater discharge is typically assessed for the acute toxicity criteria for ammonia (0.2 mg/L) the most likely species of benthic organisms in this area (*C. tentans* and *L. variegatus)* have acute toxicity criteria above this concentration.

In order to assess toxicity, a "proxy" total ammonia concentration objective for groundwater discharge can be calculated based on the unionized ammonia acute toxicity criteria of 0.2 mg/L, a typical pH of the groundwater discharge (8.0) and a typical summer groundwater temperature of 11°C. A resultant concentration of 10 mg/L total ammonia is calculated. Given that discharge of groundwater from the KPL through the sediments of the adjacent Lake Simcoe would be significantly diluted once it reaches the lake, this is considered a conservative means of evaluating the potential impact of the landfill on the lake from groundwater discharge, since the PWQO applies to surface water and dilution of the groundwater in the surface water will be substantial at this Site.

As was recommended in Golder (2017) standardized target concentrations were developed in the 2017 Annual Report (Golder, 2018) for the Sand Aquifer monitoring wells located next to the lake to assist in comparison of key parameter trends, notably for ammonia. Average concentrations (baseline mean) and standard deviations (σ) were calculated for ammonia using the concentrations reported between 2010 and 2016 at OW1-I, OW1-II and OW-2. The 'Target Concentrations' are presented in Table 6.1 below:

Table 6.1: Downgradient Ammonia Standard Target Concentrations

Target Locations	Baseline Mean (mg/L)	Standard Deviation (σ) (mg/L)	Baseline Mean plus 3σ (mg/L) (Target Concentration)	2024 Concentration (mg/L)
OW1-I	15.1	4.2	27.6	19.5
OW1-II	21.6	2.1	28.0	21.3
OW2-II[1]	8.1	1.4	12.3	31.9

[1]: baseline mean concentrations and standard deviation based on concentrations at OW1-II

The Target Concentrations are based on the “three-sigma rule of thumb”, wherein it is expected that nearly all values not influenced by changes in impact lie within three standard deviations of the arithmetic mean. When these target concentrations are exceeded, this indicates an increasing trend is likely present and further actions, commencing with close scrutiny of the concentrations and trends of other indicator parameters at this location should be undertaken.

The concentrations of ammonia at these locations in 2024 were compared to the Target Concentrations (Table 6.1). The 2024 ammonia concentrations at the OW1-I and OW1-II were below the respective standard target concentrations.

Ammonia concentrations decreased slightly in 2024 at OW2-II (31.9 mg/L, down from 34.6 mg/L in 2023); however, an increasing trend is observed since 2016 (7.6 mg/L). The concentration at this location in 2024 exceeds the standard target concentration (12.3 mg/L); this exceedance has been consistent and increasing since 2018. Overall, steady or declining trends are observed for other parameters (e.g., chloride, manganese, COD and VOC) at this location. The current ammonia concentrations are similar to those observed historically to the west at OW1-II (i.e., 24.2 mg/L in 2013). Given that the waste within the landfill is over 50 years old and there has been no change to the waste footprint or conditions over this part of the landfill (e.g., increased runoff, changes to the cover), it is concluded that significant long-term increases in ammonia originating from the landfill are not anticipated. The water quality at OW2-II is also considered to be influenced by the wastewater storage lagoons located at the WWTC, located northwest of the Site, this facility is considered a source of elevated ammonia and other parameters associated with wastewater. The absence of overlying confining layer at OW7 also provides a window where the impacts from the storage lagoons may enter the Sand Aquifer and influence the concentrations of ammonia at OW2. The trigger concentrations at OW2-II and actions relative to possible WWTC lagoon influence should be re-assessed following collection of a statistically significant amount of data from location OW9 to confirm any apparent trends in water quality downgradient of the lagoon since they were lined. Actions relative to possible WWTC lagoon influence should be undertaken if it is determined that the lining and repairs to the lagoon are not sufficient to limit the impacts downgradient. Since 2022 (i.e., three years of monitoring), a decreasing trend of ammonia has been observed at both OW9-I and OW9-II (97.2 to 77.3 mg/L and 0.8 to 0.18 mg/L, respectively) which may reflect the influence of the lining and subsequent repair of the lagoons; however, additional data is needed to confirm this trend continues to decline or stabilize.

7.0 LANDFILL GAS ASSESSMENT

The historical soil-gas monitoring results (monitored locations and methane concentrations) are summarized in Table 12. The monitoring locations are shown on Figure 2.

Action levels for methane, a component of LFG, at a closed landfill are typically established at 1.0% (v/v) methane (CH_4) by volume (i.e., 20% of the Lower Explosive Limit "LEL" of 5% v/v). When concentrations at the Site boundary exceed the 1.0% action level, it is recommended that the City undertake further assessment including the need for controls and inform the potentially affected adjacent property owner(s) of the issue.

7.1 Landfill Gas Action Plan

A Landfill Gas Action Plan was completed for the KPL, outlined in a May 2017 submission to the Ministry. Based on the historical monitoring observations and known exceedances of the LEL at the northern boundary of the park (and KPL), including existing site conditions and discussions with City staff, a barrier and passive venting system located along the south side of Kitchener Street, in combination with continued monitoring, was identified as the most feasible solution.

Four additional shallow LFG wells were installed in 2018 along the eastern property boundary to supplement the existing data. Monthly groundwater levels on the east side of the KPL were monitored on a monthly basis for one year. It was also agreed that the proposed engineering measures would extend slightly farther east, to approximately the location of the easterly entrance to the parking lot (near GP-KP2).

7.2 Landfill Gas Barrier/Venting System Design

Construction of a barrier wall and passive venting system was completed in August 2020. The layout of the barrier wall and passive venting system is shown on Figure 2. The design for this system is outlined below.

Barrier Wall

A vertical barrier wall consisting of interlocking steel sheet piles (Waterloo Barrier ™) was installed to limit lateral migration of LFG onto the adjacent private properties on the north side of Kitchener Street. Approximately 206 m length of barrier wall was installed on City lands on the south side of Kitchener Street. To fully cut off the unsaturated zone through which lateral migration of landfill gas occurs, the sheet piles were installed such that their tip (i.e., bottom) elevations corresponded to the minimum recorded groundwater levels as measured at historic gas probes near the proposed wall alignment. Relative to existing ground surface, the depth to the tip of the sheet piles is approximately 4.3 m.

Venting System

To collect and vent LFG that accumulates along the landfill side of the barrier wall, a shallow 1.2 m deep x 0.75 m wide trench was excavated and backfilled with sand and 150 mm nominal diameter perforated pipe along the full length of the barrier wall. The perforated pipe was connected to a vent stack at three locations adjacent the trench; the location of the vent stacks (GVP1, GVP2 and GVP3) are shown on Figure 2. The vent stacks consist of a 6.0 m high hollow/tapered galvanized steel pole fitted with a wind turbine at the top and founded on a concrete pier. A removable steel plate is installed at each vent pole to allow monitoring of landfill gas concentrations.

7.3 2024 Landfill Gas Concentrations

Starting in 2021, additional monitoring required under ECA No. 5412-BE7KES was undertaken to confirm the system is operating as expected and to assess the risk posed to properties north of Kitchener Park from elevated methane in soil gas. This includes monitoring and sampling at the three vent stacks (GVP1, GVP2 and GVP3). This monitoring is discussed in Section 8.0.

In 2024, LFG monitoring was completed in February and November. The highest concentrations of methane are observed south of the barrier wall (i.e., on the landfill side) at GP-KP7 and GP-KP8, at concentrations ranging from 30.8% v/v to 57.7% v/v and from 0.4% v/v to 19.7% v/v, respectively. These concentrations are generally lower than those observed in 2023 but consistent with concentrations expected in this area.

West of KPL and the barrier wall at OW8, methane concentrations in November 2024 increased to a new peak of 40.1% v/v compared to 25.3% v/v in 2018. OW8 is stationed approximately 100 m west of the LFG wall/vent system but within approximately 50 m of the westernmost landfill extent. This location is located more than 100 m from the nearest commercial building on Kitchener Street and the nearest potential receptor are the WWTC buildings; these WWTC buildings are equipped with methane detectors. Trace to low methane concentrations were measured north of the barrier wall and within the landfill footprint, concentrations remained elevated (7.3% v/v to 1.4% v/v at OW3 in 2024, compared to 0.8% v/v to 17.2% v/v in 2023). Methane concentrations were lower within the eastern portion of the landfill footprint (i.e., OW6-II), where concentrations ranged from of 6.4% v/v to 29.5 % v/v. Methane remained at trace concentrations to no methane detected at the remaining locations during the 2024 monitoring year.

The 2024 LFG monitoring indicates that there is no (or essentially no) methane present at the northeast and eastern boundaries of the KPL. The cover of the landfill consists largely of coarse-grained soils and, as a result, methane is expected to preferentially vent to the atmosphere. Under frozen ground conditions, or under pavement and building foundations, LFG may migrate preferentially within the coarser grained materials above the water table. To the east of the landfill, the migration of LFG is limited by the thinning of the unconfined peat/sand aquifer and the shallow water table, which limit the area through which LFG will migrate. Additionally, where the depth of the surrounding ditches reaches the water table, off-site migration is further limited.

Performance of the passive venting and cut-off wall is, in part, assessed through monitoring of the soil-gas probes located north of the cut-off wall (i.e., GP-KP9, GP-KP10 and GP-KP11). Low concentrations of methane have been detected at locations GP-KP9 and GP-KP10 since the installation of the barrier wall and remained low in 2024 (0.2 and 0.1% v/v, respectively). GP-KP11 was not found in 2024 and was not sampled, however no methane was detected at this location from November 2020 to the last monitoring event where GP-KP11 was sampled in 2022. Methane concentrations recorded at the three monitoring locations were largely similar to or slightly lower than in previous years, which suggests the cut-off wall is effectively limiting LFG gas migration to the commercial buildings north of the KPL.

As noted in Section 1, there are two buildings on the KPL Site, including a utility building located in the central portion of the landfill, and a storage building located in the southeast corner. The City indicates that the both the utility building and storage building are equipped with under-slab venting.

8.0 PASSIVE VENTING SYSTEM MONITORING

Section 8 of this annual report satisfies the requirements outlined in Condition 1.2 of the ECA No. 5412-BE7KES, which requires the annual report to include:

- the frequency of monitoring adopted
- the concentration of contaminants discharging in the air
- the wind speeds and wind directions recorded at the time of monitoring
- the results of dispersion calculations, using one of the approved dispersion models listed in Section 6 of O. Reg 419/05, indicating the maximum point of impingement concentrations of contaminants in the gas discharging to air

There were no complaints received by the City relating to the operation of this system in 2024. No repairs or maintenance of the system was undertaken.

8.1 Summary of Gas Monitoring Well Results

Performance of the passive venting and cut-off wall LFG control measures installed at the KPL is, in part, assessed through monitoring of the soil-gas probes located north of Kitchener Street (i.e., GP-KP9, GP-KP10 and GP-KP11). Methane concentrations north of the barrier wall were detected only at GP-KP-9 and GP-KP10, at concentrations well below the 2.5% v/v action level. GP KP11 was not found in 2024 and was not sampled. Methane concentrations recorded at GP-KP9, GP-KP10 and GP-KP11 have decreased from those reported prior to construction of the barrier wall, which suggests the LFG control system is limiting LFG gas migration to the north of the KPL.

8.2 Summary of Passive Gas Vent System Monitoring Results

A semi-annual monitoring frequency is required at the three gas venting poles (GVP1 to GVP3); one of the monitoring rounds is completed under frozen ground conditions (February/March). As part of the gas vent monitoring completed at the Site in 2024, methane (%LEL and %CH_4), carbon dioxide (% volume) and oxygen (% volume) and flow rates were recorded.

A summary of the gas probe monitoring is provided in Table 8.1 below. The methane, carbon dioxide and oxygen readings were recorded using a calibrated GEM 2000. Flow rate of landfill gas venting upward within the vent system poles were measured using a VelociCalc ventilation meter. The methane readings measured in the GVP were between 0.0 % to 0.3% by volume. The maximum reading of 0.1% was reported in GVP1, GVP2, and GVP3 on February 23, 2024, and a reading of 0.1% was reported at GVP2 again on November 14, 2024.

Table 8.1: Summary of 2024 Gas Venting Pole Monitoring

Location	Date	CH4 (% volume)	CO2 (% volume)	O2 (% volume)	Flow Rate (cfm)
GVP1	23-Feb-24	0.1	0.1	21.3	5.07
	14-Nov-24	0.0	1.0	20.1	9.40
GVP2	23-Feb-24	0.1	0.3	21.1	2.76
	14-Nov-24	0.1	0.7	20.4	12.78
GVP3	23-Feb-24	0.1	0.1	21.1	2.64
	14-Nov-24	0.0	0.2	20.7	5.45

8.3 Landfill Gas Passive Vent Sampling Results

Samples were collected semi-annually from all GVP (GVP1 through GVP3) on February 23 and November 14, 2024. Samples were analyzed for methane, hydrogen sulphide, oxygen, carbon monoxide, carbon dioxide and VOC. Gas samples were collected in Tedlar bags using a lung box apparatus with a Gilair™ pump and submitted to Bureau Veritas Laboratories for analysis. These sample results were used to update the emission rates and

maximum predicted off-site concentrations. Laboratory Certificates of Analysis for the gas venting pole samples are provided in Appendix C. A summary of the landfill gas chemistry results is provided in Table F-1 (Appendix F).

8.4 Summary of Wind Speed and Direction

Meteorological data was taken from Lake Simcoe Regional Conservation Authority for the Orillia WWTC weather station (Station Number LS0209, available: https://data.lsrca.on.ca/wiski/applications/public.html?publicuser=Public#waterdata/stationoverview; accessed: March 24, 2025). This station is located in the immediate vicinity (approximately 0.5 km west) of the Site. This weather station is considered to accurately represent Site weather conditions during the sampling periods. A summary of the weather conditions (temperature, barometric pressure, wind direction and average wind speed) during the semi-annual sampling events is provided in Table 8.2 below.

Table 8.2: Summary of 2024 Weather Conditions during Gas Venting Pole Monitoring

Date	Time	Temperature (°C)	Barometric Pressure (kPa)	Wind Speed (km/h)	Wind Direction (°)
February 26, 2024	10:00	2.6	98.7	12	-
	11:00	3.8	98.7	10	-
	12:00	2.4	98.7	8	-
	13:00	3.2	98.7	10	-
November 14, 2024	10:00	4.4	99.1	14	-
	11:00	5.1	99.0	12	-
	12:00	5.5	98.9	18	-
	13:00	5.6	98.9	24	-

Note: Wind direction was not available during the sampling dates at the time of accessing the WWTC weather station online database.

8.5 Concentrations of Contaminants Discharging to Air

An Emission Summary and Dispersion Modelling (ESDM) report (Golder, 2019a) was originally prepared in 2019 as part of an application for an Environmental Compliance Approval (ECA) for emissions to air under Section 9 of the Environmental Protection Act. Condition 2.2 of the ECA states that the emission calculations and dispersion modelling used to support this ESDM are to be updated annually using the results of the monitoring completed in the previous calendar year. A summary of the methodology and results used to update the emission calculations and modelling with 2024 sampling data are included in the following section.

8.5.1 Gas Venting Poles

Emission rates of landfill gas constituents released through the passive vent poles were calculated using the maximum measured concentration (ppb or µg/m^3) of each contaminant in any of the vents during each sampling round (Table F-1) and the average volumetric flow rate (m^3/s) to determine an emission rate (g/s). Average flow rate for each vent, is provided in Table 8.1.

The equations used to calculate the emission rates are provided below:

$$Concentration\ \left(\frac{\mu g}{m^3}\right) = Concentration\ (ppb) \times MW\ \left(\frac{g}{mol}\right) \times R\left(\frac{m^3 atm}{mol\ K}\right) \times T\ (K) \times \frac{1}{p(atm)} \times \frac{1\ ppm}{1000 ppb}$$

Where:

- MW = Molecular Weight at 25ºC and 1 atmosphere
- R = Ideal gas constant
- P = atmospheric pressure (atm)
- T = Temperature (K)

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Concentration\left(\frac{\mu g}{m^3}\right) \times volumetric\ flow\ rate\left(\frac{m^3}{s}\right) \times \frac{1g}{1000000\mu g}$$

The purpose of the passive vent sampling is to provide further understanding of the concentrations of the contaminants discharging to air and to confirm that the assessment completed as part of the 2019 ESDM Report (Golder, 2019a) does not underestimate the predicted off-site air quality impacts from the passive venting system.

Sampling was completed for the analytical laboratory standard suite of 68 Volatile Organic Compounds (VOC) during the frozen ground condition sampling event in February 2024. This list of VOC includes many contaminants common to landfill gas including for example, vinyl chloride. Of these 68 compounds, 15 compounds were sampled at concentrations greater than the detection limit for at least one vent during the February sampling round. In the November sampling event, 21 compounds were found to be sampled at concentrations greater than the detection limit for at least one vent. For contaminants that were not found at concentrations greater than the detection limit, emission rates were calculated using a concentration equal to the detectable limit for that compound. The detailed emission rate calculations are included in Appendix F.

8.5.2 Landfill Mound Venting

Emission rates of landfill gas constituents released fugitively through the landfill mound were calculated using the emissions from the passive vents. It was conservatively assumed that the total emissions from the landfill gas vents represent 80% of the emissions from the landfill and the remaining 20% are released from the landfill surface.

An updated Source Summary Table of all emissions from the venting poles is included in Table F-3.

8.5.3 Identification of Significant Contaminants Using an Emission Threshold

Negligible contaminants were identified using the Emission Threshold Calculation, as described in s.7.1.2 of the ESDM Procedure Document (MECP, 2018) and can be found in Appendix F. These contaminants were excluded from the dispersion modelling analysis.

As per the ESDM Procedure Document, contaminants that are emitted from a facility may be identified as negligible when they are below the emission thresholds that are developed using the following formula:

$$Emission\ Threshold\ [g/s] = \frac{0.5 \times Ministry\ POI\ Limit\ [\mu g/m^3]}{Dispersion\ Factor\ [\mu g/m^3\ per\ g/s]}$$

The dispersion factor selected for the Facility is the Ministry's urban dispersion factor of 8,700 (µg/m^3 per g/s emission) for a distance from source of 20 m and based on a 1-hour averaging period. This dispersion factor was developed by the Ministry using a series of conservative modelling factors for a short stack on a 6 m tall building and can be found in Table B-1 of the ESDM Procedure Document.

For contaminants that have Ministry POI Limits that are not based on 1-hour averaging periods, the conversion to the appropriate averaging periods was completed using the recommended conversion factors, as documented in Ministry Guidance (MECP, 2017).

Of the 68 contaminants assessed, all 68 were considered negligible using the Emission Threshold Calculation. Accordingly, no contaminants were carried forward into a dispersion modelling analysis. It should be noted that this assessment assumes that all contaminants recorded as below the detection limit by the laboratory assessment are assumed to be emitted in a concentration equal to the detection limit. As a result, the assessment is considered conservative, as documented in section 8.5.1.

8.6 Dispersion Modelling

Dispersion modelling for the facility ESDM report for the significant contaminant was conducted in accordance with the MECP *publication "Guideline A-11: Air Dispersion Modelling Guideline for Ontario, Version, 3.0"*, dated February 2017 (ADMGO) PIBS 5165e03.

Compliance was assessed using the AERMOD dispersion modelling system and s.20 standards guidelines.

The AERMOD modelling system is made up of the AERMOD dispersion model, the AERMET meteorological pre-processor, the AERMAP terrain pre-processor and the BPIP building downwash pre-processor. As all contaminants were found to be negligible as per the emission rates calculated as described in Section 8.5, additional dispersion modelling was not required for the 2024 sampling year. The emission rate calculations and negligibility assessment are provided in Appendix F.

8.6.1 Dispersion Modelling Input Summary Table

The passive venting system retains the source parametrization outlined in the 2019 ESDM report (Golder, 2019a), with the exception of the flow rates for the vent poles that were updated to reflect the 2024 measured data. This adjustment of flow rates and sampled concentrations alters the emission rates year over year. As all contaminants were found to be emitted in negligible amounts, air dispersion modelling is not required, as per section 7.1.2 of the MECP's ESDM Procedure Document.

An updated Dispersion Modelling Source Summary Table is provided as Table F-2. The modelling files completed for the 2023 reporting year remain the most recent for the facility.

8.6.2 Meteorology, Surrounding Land Use and Terrain

The AERMOD model is required to be run using the site-specific pre-processed five-year dispersion meteorological dataset (i.e., surface and profile files), provided by the Ministry, in accordance with paragraph 3 of s.13(1) of O.Reg.419/05.

Terrain data used in this assessment can be obtained from the Ministry. The Canadian Digital Elevation Model (CDEM) data in GeoTIFF format that remains in use in this assessment is: 'cdem_dem_031D.tif'. Both the meteorological dataset and terrain data remain consistent with the 2023 reporting year modelling files for the facility.

8.6.3 Receptors

Receptor locations are consistent with the 2019 ESDM report (Golder, 2019a).

8.6.4 Averaging Periods and Conversions

Section 20 of O. Reg. 419/05 applies to this Landfill. Many of these standards and guidelines are based on 1-hour and 24-hour averaging times, which are averaging times that are easily provided by AERMOD. In cases where a standard and/or guideline has an averaging period that AERMOD is not designed to predict (e.g., ½-hr or 30-day), a conversion to the appropriate averaging period was completed using the MECP recommended conversion factors, as documented in the ADMGO and the MECP *Technical Bulletin Methodology for Modelling Assessments with 10-Minute Average Standards and Guidelines under O. Reg. 419/05*, dated April 2008. This same averaging period conversion is completed for the screening of contaminants for negligibility.

8.6.5 Dispersion Modelling Options

The options used in the most recent AERMOD dispersion model are summarized in the table below.

Modelling Parameter	Description	Used in the Assessment?
DFAULT	Specifies that regulatory default options will be used	Yes
CONC	Specifies that concentration values will be calculated	Yes
AVERTIME	Time averaging periods calculated	1-hr, 24-hr, Annual

8.7 Maximum Predicted Concentrations

The emission rates for all contaminants were compared against the applicable s.20 standards and guidelines listed as Benchmark 1 in the *Air Contaminants Benchmark (ACB) List*, dated April 2023 (List of Ministry POI Limits). The updated Emission Summary Table (F-5) outlines the negligibility of the facility emissions in the 2024 reporting year.

Contaminants released by the Facility that do not have Benchmark 1 standards or guidelines in the ACB List are considered to be ‘Contaminants with No MECP POI Limits’. Where applicable, predicted POI concentrations of ‘Contaminants with No MECP POI Limits’ were screened against the Benchmark 2 screening levels in the ACB List or the *de minimus* limit. Predicted concentrations of all ‘Contaminants with No MECP POI Limits’ were found to be below the corresponding Benchmark 2 screening level or *de minimus* limit.

Based on the results of modelling the 2024 monitored contaminants, the predicted concentrations of all monitored contaminants were deemed negligible and less than the predicted concentrations identified in the 2019 ESDM report (Golder, 2019a) thus illustrating that the assumptions used in the 2019 ESDM report (Golder, 2019a) do not underestimate emissions from the passive venting system and the Site is operating in compliance with Ontario Regulation 419/05. 2024 was the third year for which passive vent sampling and modelling was completed. The results of the 2024 assessment are consistent with those presented in the 2022 report. Given the similar low concentrations during the past three years of measurements, it is recommended that the need for sampling and modelling of in-stack concentrations is reviewed in consultation with the MECP District Manager.

9.0 CONCLUSIONS

1) The groundwater flow direction in the Unconfined aquifer under the KPL is radial with an overall southward component toward Lake Simcoe. The groundwater flow direction in the underlying Sand Aquifer is to the south towards Lake Simcoe. The shallow groundwater flow to the northeast and east is limited by the elevation of the till confining unit, which rises to the east. The shallow water levels towards the east of Site (e.g., at OW5) indicate that the potentiometric surface is below the invert of the ditch and therefore point-source leachate impacts in the ditches are not expected. Based on the topography east of the KPL, it is inferred that groundwater flow east of the landfill will be largely southward towards Lake Simcoe.

2) Groundwater impacts related to landfill leachate are observed in both the shallow (Unconfined Aquifer) and deep (Sand Aquifer). Impacts are largely identified by elevated ammonia, iron, and low VOC. The highest concentrations of typical leachate parameters are present at OW6-I under the central portion of the landfill. Lower concentrations at OW4-1 indicate that the leachate impacts are less in the eastern part of the landfill; relatively low concentrations are also present at OW4-II. Stable or declining concentrations of most key indicator parameter concentrations are observed in the groundwater downgradient of the landfill, adjacent to Lake Simcoe. Exceptions are noted at OW2-II where increasing trends of ammonia and iron concentrations have been observed in recent years.

3) Elevated concentrations of ammonia and other parameters observed in the Sand Aquifer within the western portion of the Site (i.e., at OW8, BH28-I and BH28-II and notably at OW9-II) are considered to be influenced by the storage lagoons located at the WWTC, located northwest of the KPL, which were unlined prior to 2015. In 2021, major repairs at the WWTC of the north lagoon liner were undertaken to repair significant liner damage, which occurred during biosolids removal operations. Sludge found under the liner during the repairs was removed and the remedial work was completed by November 2021. It is considered possible that elevated ammonia at various locations downgradient of the WWTC could also be in part associated with the liner damage. It is noted that one unlined lagoon remains in operation at the south-east corner of the WWTC on an as-needed basis; this lagoon is used for decanting sewage impacted material.

4) Elevated (but declining) concentrations of sodium and chloride within the Sand Aquifer are considered to reflect road salting activities along Kitchener Street and West Street, as well as areas further upgradient. This is evident by the elevated chloride in the background water quality at BH1. As road salt impacts are observed in the background water quality samples, ammonia is the primary indicator of groundwater quality influence by the landfill, and to an extent, the WWTC lagoons.

5) The KPL is considered to be the source of some of the VOC (e.g., chlorobenzene and 1,4-dichlorobenzene) observed in the Sand Aquifer, whereas off-site sources (i.e., from industrial lands to the north of the Site) or spills may contribute to other VOC parameters. There were no exceedances of the PWQO observed for VOC at wells located in the Sand Aquifer adjacent to the lake.

6) The 2024 ammonia concentrations at the OW1-I and OW1-II were below the respective standard target concentrations, whereas the 2024 ammonia concentration at OW2-II (31.9 mg/L) again exceeded the standard target concentration (12.3 mg/L). The target concentrations were developed to provide a mechanism for initiating further detailed assessment; Whereas the water quality at OW2-II is influenced by the landfill as evident in the elevated leachate parameter concentrations, the Sand Aquifer is unconfined in the area of OW7 and water quality at OW2-II is influenced by the storage lagoons located at the WWTC, located northwest of the Site, prior to their lining in 2015. This effect may be observed for some time until the previously unlined lagoon impacts and impacts from the biosolids removal operation that were repaired in 2021 have migrated beyond OW2-II within the Sand Aquifer. It is noted that the effects may continue by use

of the unlined lagoon on an as needed basis. A decreasing trend of ammonia has been observed at both OW9-I and OW9-II since monitoring initiated three years ago, which may reflect the influence of the lining of the lagoons; however, additional data is needed to confirm this trend continues to decline or stabilize. Actions relative to possible WWTC lagoon influence should be undertaken if it is determined that the lining and repairs to the lagoon are not sufficient to limit the impacts downgradient.

7) Methane concentrations detected north of Kitchener Street at GP-KP9 and GP-KP10 of the LFG control system are minimal (0.1% to 0.2%) and are not considered to be a concern with respect to buildings located to the north. The results indicate that LFG control system is effectively preventing LFG gas migration to the north of the KPL. No methane was detected at any of the monitoring wells installed along the eastern property boundary in 2024.

8) The maximum conservative estimated gas concentrations assessed in the air dispersion assessment and ESDM report update remain negligible as per the MECP's ESDM Procedure Document section 7.1.2. The results for 2024 remain below the relevant air quality criteria and less than the maximum predicted concentrations identified in the 2019 ESDM report that supports the ECA. This illustrates that the assumptions used in the 2019 ESDM report provide a conservative assessment of emissions from the passive venting system, which is operating in compliance with the ECA.

10.0 RECOMMENDATIONS

1) The City should continue the ongoing water quality and landfill gas monitoring program as per Table 4.

2) Given that ammonia at OW2-II (31.9 mg/L) continues to be above the target concentration, the behaviour of ammonia at this location should be monitored closely. Actions relative to possible WWTC lagoon influence should be undertaken if it is determined that the lining and repairs to the lagoon are not sufficient to limit the impacts downgradient.

3) The need for continued passive vent sampling and modelling should be reviewed with the District Manager. At this time four annual sampling and modelling exercises have been completed, with all results below the relevant air quality criteria, accordingly, it is recommended that the sampling frequency be reduced to a single event annually.

4) A replacement gas probe should be installed near GP-KP11 to continue monitoring the performance of the passive venting and cut-off wall in that area.

Signature Page

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12.0 SITE CONTACT INFORMATION

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City of Orillia

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Tables

Table 1
Summary of Aquifer Testing

Hydrostratigraphic Unit	Inferred Thickness Range (m)	Range of Hydraulic Conductivity (cm/s)	Tested Observation Wells
Unconfined Aquifer (Peat)	0 – 2.3	1.0×10^{-4}	OW1-III
Unconfined Aquifer (medium sand to silt)	0 – 2.5	2.1×10^{-3} to 9.5×10^{-4}	OW4-II
			GP-KP4
Waste	0 – 3	1.5×10^{-4} to 8.0×10^{-5}	OW3
			OW6-II
Upper Confining Layer	0 – 6	ND	None
Confined (Sand) Aquifer	0 – 8.4	1.2×10^{-3} to 8.2×10^{-5}	OW1-I
			OW2-I
			OW2-II
			OW6-I

NOTES:
ND: Not Determined
Source: Golder, 2005b

Table 2
Monitoring Location Details

Monitoring Well	Measuring Point Elevation (Top of Pipe) (masl)	Ground Surface Elevation (masl) [2]	Easting (m) [2]	Northing (m) [2]	Stick Up (m)	Top of Screen (masl)	Base of Screen (masl)	Hydrostratigraphic Unit
OW1-I	220.00	219.11	626219	4938542	0.89	211.49	206.92	Sand Aquifer
OW1-II	220.22	219.35	626219	4938542	0.87	214.78	213.25	Sand Aquifer
OW1-III	220.17	219.35	626219	4938542	0.82	218.25	217.03	Unconfined Aquifer
OW2-I	220.84	219.90	626310	4938591	0.94	212.58	210.15	Sand Aquifer (base)
OW2-II	220.49	219.90	626310	4938591	0.59	217.77	213.19	Sand Aquifer (upper)
OW3	224.19	223.33	626243	4938663	0.86	221.5	219.06	Waste
OW4-I	220.51	219.64	626505	4938640	0.87	214.65	212.62	Sand Aquifer
OW4-II	220.44	219.64	626505	4938640	0.80	218.72	217.50	Unconfined Aquifer
OW5-I	221.36	220.42	626545	4938783	0.94	215.09	213.56	Sand Aquifer
OW5-II	221.27	220.42	626545	4938783	0.85	217.68	215.24	Upper Confining Layer
OW6-I	222.42	221.41	626441	4938712	1.01	217.14	214.00	Sand Aquifer
OW6-II	222.42	221.41	626441	4938712	1.01	219.89	217.45	Waste
OW7 [1]	224.09	223.20	626265	4938773	0.89	218.95	213.16	Sand Aquifer
OW8	223.17	222.16	626123	4938647	1.01	221.25	218.96	Fill
OW9-I	223.741	222.80	626176	4938718	0.94	215.7	213.96	Upper Confining Layer
OW9-II	223.873	222.80	626176	4938718	1.07	219.75	216.7	Sand Aquifer
BH28-I	222.07	221.38	626041	4938592	0.70	218.0	216.5	Sand Aquifer
BH28-II	221.85	221.31	626041	4938592	0.54	220.4	218.9	Fill
GP-KP2	223.45	222.59	626399	4938864	0.86	220.46	217.41	Lower Confining Layer
GP-KP3	222.11	221.06	626498	4938860	1.05	219.54	216.49	Lower Confining Layer
GP-KP4	220.93	219.63	626617	4938668	1.30	218.85	217.32	Unconfined Aquifer
GP-KP7	224.21	223.18	626266	4938774	1.03	221.96	219.52	Waste
GP-KP8	223.89	222.88	626327	4938812	1.01	221.36	218.31	Waste
GP-KP9	223.04	223.20	626221	4938774	-0.16	221.98	218.93	Upper Confining Layer
GP-KP10	222.52	222.63	626275	4938807	-0.11	221.87	218.82	Upper Confining Layer
GP-KP11	222.34	222.53	626329	4938839	-0.19	221.63	218.53	Upper Confining Layer
GP-KP12	223.03	222.00	626454	4938896	1.03	221.24	218.95	Unconfined Aquifer
GP-KP13	221.26	220.27	626521	4938821	0.99	219.51	217.22	Unconfined Aquifer
GP-KP14	221.28	220.16	626548	4938776	1.12	219.40	217.87	Unconfined Aquifer
GP-KP15	220.57	219.71	626579	4938727	0.86	219.10	217.58	Unconfined Aquifer

NOTES:

masl: metres above sea level

NA: data not available

1) Well originally referred to as GP-KP1

2) Coordinate provided georeferenced UTM NAD 83 Zone 7, accurate to within approximately 5 m. Data provided electronically by the City of Orillia Coordinates provided for monitoring well nest represent centroid position between monitoring locations. Elevation data provided electronically by the City of Orillia, accurate to within 0.1 m.

2024 KPL Groundwater and Surface Water Monitoring Program

Locations	Parameters	Comments
OW1-I OW1-II OW1-III OW2-I OW2-II OW3 OW4-I OW4-II OW6-I OW6-II OW7 OW9-I OW9-II	**Major Ions and Indicators** Ca, Mg, Cl, K, Na, SO_4 Alkalinity, Hardness, Conductivity, pH, TSS, TDS	
	Metals (extended): Al, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Ag, Sr, Zn	
	Nutrients NH_4, NO_3, NO_2, TKN, DOC, Phenols, Orthophosphate, Total P	
	Volatile Organic Compounds (VOC)	
BH28-I BH28-II OW5-I OW5-II OW8	**Major Ions and Indicators** Ca, Mg, Cl, K, Na, SO_4 Alkalinity, Hardness, Conductivity, pH, TSS, TDS	VOC not analyzed at these locations. Metals not analyzed at BH28-I.
	Metals (standard): Fe, Mn, Ni, P, Zn	
	Nutrients NH_4, NO_3, NO_2, TKN, DOC, Phenols, Orthophosphate, Total P	

Table 4
Proposed 2025 Monitoring Program

Location	Unit	Water Level	Landfill Gas Monitoring	Major Ions and Indicators	Nutrients	Metals	VOCs	Hydrostratigraphic Unit Descriptions	
OW1-I	SA	S		A	A	A	A		
OW1-II	SA	S		A	A	A	A	P	Peat
OW1-III	P	S		A	A	A	A	UA	Unconfined Aquifer
OW2-I	SA	S		A	A	A	A	SA	Sand Aquifer
OW2-II	SA	S		A	A	A	A	UCL	Upper Confining Layer
OW3	LF	S	S	A	A	A	A	LCL	Lower Confining Layer
OW4-I	SA	S		A	A	A	A	LF	Landfill/Leachate
OW4-II	UA	S		A	A	A	A	F	Fill
OW5-I	SA	S		A	A	A		SW	Surface Water
OW5-II	UCL	S							
OW6-I	SA	S		A	A	A	A		
OW6-II	LF	S	S	A	A	A	A		
OW7	SA	S		A	A	A	A		
OW8	F	S	S	A	A	A			
OW9-I	LCL	S		A	A	A	A	UCL	Upper Confining Layer
OW9-II	SA	S		A	A	A	A	SA	Sand Aquifer
BH28-I	SA	S		A	A				
BH28-II	F	S		A	A	A			
GP-KP2	LCL	S	S						
GP-KP3	LCL	S	S						
GP-KP4	UA	S	S						
GP-KP7	LF	S	S						
GP-KP8	LF	S	S						
GP-KP9	UCL	S	S						
GP-KP10	UCL	S	S						
GP-KP11	UCL	S	S						
GP-KP12	UA	S	S						
GP-KP13	UA	S	S						
GP-KP14	UA	S	S						
GP-KP15	UA	S	S						

NOTES:

A - Annual Event (1 monitoring event)

S - Semi-Annual Event (2 monitoring events)

Detection levels for analyses must be set to meet PWQO or OWDS where criteria have been established

Table 5
Groundwater and Leachate Level Elevation Monitoring

Monitoring Location	Reference Elevation [1] (masl)	Ground Surface Elevation (masl)	Stick Up (m)	April 2024			September 2024		
				Depth to Water (mbmp)	Depth to Water (mbgs)	Water Level Elevation (masl)	Depth to Water (mbmp)	Depth to Water (mbgs)	Water Level Elevation (masl)
OW1-IR	220.00	219.11	0.89	0.55	-0.34	219.45	1.15	0.26	218.85
OW1-II	220.22	219.35	0.87	0.70	-0.17	219.52	1.34	0.47	218.88
OW1-III	220.17	219.35	0.82	1.10	0.28	219.07	1.41	0.59	218.76
OW2-I	220.84	219.90	0.94	1.17	0.23	219.67	2.26	1.32	218.58
OW2-II	220.49	219.90	0.59	1.22	0.63	219.27	1.94	1.35	218.55
OW3	224.19	223.33	0.86	3.50	2.64	220.69	4.22	3.36	219.97
OW4-I	220.51	219.64	0.87	1.14	0.27	219.37	1.65	0.78	218.86
OW4-II	220.44	219.64	0.80	1.08	0.28	219.36	1.64	0.84	218.80
OW5-I	221.36	220.42	0.94	1.11	0.17	220.25	2.59	1.65	218.77
OW5-II	221.27	220.42	0.85	1.90	1.05	219.37	2.70	1.85	218.57
OW6-I	222.42	221.41	1.01	2.25	1.24	220.17	3.24	2.23	219.18
OW6-II	222.42	221.41	1.01	1.76	0.75	220.66	2.28	1.27	220.14
OW7	224.09	223.20	0.89	3.86	2.97	220.23	4.97	4.08	219.12
OW8	223.17	222.16	1.01	2.63	1.62	220.54	3.99	2.98	219.18
OW9-I	223.74	222.80	0.94	4.21	3.27	219.53	4.85	3.91	218.89
OW9-II	223.87	222.80	1.07	3.34	2.27	220.53	4.61	3.54	219.26
BH28-I	222.07	221.38	0.70	2.57	1.88	219.50	3.17	2.48	218.90
BH28-II	221.85	221.31	0.54	1.76	1.22	220.09	2.57	2.03	219.28
GP-KP2	223.45	222.59	0.86	2.89	2.03	220.56	4.26	3.40	219.19
GP-KP3	222.11	221.06	1.05	1.93	0.88	220.18	4.40	3.35	217.71
GP-KP4	220.93	219.63	1.30	1.61	0.31	219.32	2.24	0.94	218.69
GP-KP7	224.21	223.18	1.03	3.41	2.38	220.80	4.54	3.51	219.67
GP-KP8	223.89	222.88	1.01	2.37	1.36	221.52	3.62	2.61	220.27
GP-KP9	223.04	223.20	-0.16	N/A	N/A	N/A	N/A	N/A	N/A
GP-KP10	222.52	222.63	-0.11	N/A	N/A	N/A	N/A	N/A	N/A
GP-KP11	222.34	222.53	-0.19	N/A	N/A	N/A	N/A	N/A	N/A
GP-KP12	223.03	222.00	1.03	1.98	0.95	221.05	3.78	2.75	219.25
GP-KP13	221.26	220.27	0.99	1.76	0.77	219.50	2.92	1.93	218.34
GP-KP14	221.28	220.16	1.12	1.87	0.75	219.41	2.40	1.28	218.88
GP-KP15	220.57	219.71	0.86	1.41	0.55	219.16	1.86	1.00	218.71

NOTES:

1) Reference Elevation is the elevation at top of casing or measuring point.
masl - metres above mean sea level.
mbmp - metres below measuring point.
mbgs - metres below ground surface.
NA - data not available.

2024 Background Water Quality - Key Indicator Parameters

Parameter [1]	PWQO	BH1-IR	BH1-III[4]
Alkalinity	-	225	311
Chloride	-	198	436
Sodium	-	107	227
Iron	0.3	2.9	2.7
Manganese	-	455	432
Potassium	-	1.72	1.23
Ammonia	0.02 [2]	0.06	0.25
DOC	-	19	51
COD	-	91	203
Aluminum (µg/L)	75	13	-
Cadmium (µg/L)	0.5	0.03	-
Cobalt (µg/L)	0.9	1.20	-
Lead (µg/L)	5	<0.05	-
Nickel (µg/L)	25	4.3	-
Phosphorous	0.02	0.22	2.54
Zinc (µg/L)	20	2	-

NOTES:

1) All concentrations reported as mg/L . Note: BH1-I and BHI-III are located at the KWDS.
2) The PQWO of 0.02 mg/L is for un-ionized ammonia. The measured concentrations are for total ammonia.
3) Average of three sampling events.
4) Peat Unit

Table 7

2024 Leachate Quality - Key Indicator Parameters

Parameter[1]	PWQO	OW3	OW6-II	Ratio (maximum concentration / PWQO)
Alkalinity	-	496	815	-
Chloride	-	28.8	8.2	-
Sodium	-	30	20.5	-
Iron	0.3	**44.7**	**34.4**	149
Manganese	-	385	1260	-
Potassium	-	10.9	21.3	-
Ammonia	0.02 [2]	**14.9**	**24.8**	-
DOC	-	14.9	14.7	-
COD	-	72.2	72.5	-
Aluminum (µg/L)	75	6	12	0.16
Cadmium (µg/L)	0.5	0.049	0.011	0.098
Chromium (µg/L)	8.9	7.7	**12.5**	1.40
Cobalt (µg/L)	0.9	**1.4**	**1.4**	1.56
Copper	0.005	**1.5**	**1.2**	300
Lead (µg/L)	5	0.33	0.12	0.07
Nickel	0.025	**3.9**	**4.2**	-
Phosphorous	0.02	**0.49**	**2.23**	111.50
Selenium	0.1	**0.45**	**0.15**	4.5
Silver	0.0001	**<0.01**	**<0.01**	
Zinc (µg/L)	20	6	7	0.35
Benzene (µg/L)	100	0.3	1.1	0.01
Monochlorobenzene (µg/L)	15	1.1	7.8	0.52
1,4-Dichlorobenzene (µg/L)	4	0.5	0.9	0.225
Xylene, m-,p- (µg/L)	32	<0.5	**1600**	50

NOTES:

1) All concentrations reported as mg/L.

2) The PQWO of 0.02 mg/L is for un-ionized ammonia. The measured concentrations are for total ammonia.

3) Exceedances of the PWQO are shown in Bold.

2024 Fill Water Quality - Key Indicator Parameters

Parameter[1]	PWQO	OW8	BH28-I	BH28-II
Alkalinity	-	410	497	584
Chloride	-	167	110	23.9
Sodium	-	83.8	66.1	42.0
Iron	0.3	10.7	36.2	1.9
Manganese	-	527	1270	305
Potassium	-	8.5	7.6	20.1
Ammonia [2]	0.02 [2]	3.8	3.9	40.3
DOC	-	5.9	9.1	21.1
COD	-	70	54	249
Aluminum (µg/L)	75	<1	-	5
Antimony	0.02	-	-	-
Cadmium (µg/L)	0.5	<0.005	-	0.023
Cobalt (µg/L)	0.9	0.7	-	1.8
Lead (µg/L)	5	<0.05	-	0.2
Molybdenum	0.04	-	-	-
Nickel (µg/L)	25	7.2	-	14.0
Phosphorous	0.02	0.15	<0.002	5.07
Zinc (µg/L)	20	3	-	16

NOTES:

1) All concentrations reported as mg/L unless indicated otherwise.
2) The PQWO of 0.02 mg/L is for un-ionized ammonia. The measured concentrations are for total ammonia.

Table 9
2024 Sand Aquifer Water Quality - Key Indicator Parameters

Parameter [1]	PWQO	OW1-I	OW1-II	OW2-I	OW2-II	OW4-I	OW6-I	OW7	OW9-II
Alkalinity	-	681	642	1050	725	560	706	521	573
Chloride	-	94.3	81	114	43.8	12.2	12	46.1	422
Sodium	-	90.5	64.7	176.0	49.5	25.5	21.1	28.5	172.0
Iron	0.3	**28.6**	**40.6**	**9.36**	**50.5**	**26.1**	**49.4**	**41.2**	0.18
Manganese	-	162	249	115	376	459	414	818	849
Potassium	-	18.1	19.40	5.27	21.10	3.09	29.20	7.77	12.90
Ammonia	0.02 [2]	19.5	21.30	0.05	31.90	1.23	30.10	12.20	0.18
DOC	-	16.3	13.6	15.5	18.4	14.2	13.5	9.5	8.3
COD	-	68	70	78	72	74	56	49	50
Aluminum (µg/L)	75	5	3	1	5	3	7	3	3
Cadmium (µg/L)	0.5	0.032	0.041	0.027	0.066	0.038	0.139	0.033	0.118
Cobalt (µg/L)	0.9	**11.7**	**16.6**	**2.0**	**14.9**	**1.9**	**13.9**	**1.0**	**3.7**
Copper	0.005	**2.3**	**2.1**	**3.8**	**3.0**	**1.1**	**1.3**	**1.2**	**15.9**
Lead (µg/L)	5	0.10	0.13	0.07	0.15	0.15	0.11	0.08	0.14
Molybdenum	0.04	-	-	-	-	-	-	-	-
Nickel (µg/L)	25	11.3	10.4	12.4	16.3	3.2	15.4	3.0	13.5
Phosphorous	0.02	**0.084**	0.007	**0.722**	**0.041**	**0.450**	**1.170**	**0.096**	**0.134**
Zinc (µg/L)	20	8	6	8	6	8	5	8	10
Benzene (µg/L)	100	4.3	4.0	0.6	1.3	<0.2	2.0	0.8	-
Monochlorobenzene (µg/L)	15	9.7	9.4	<0.5	1.7	<0.5	**21.2**	3.1	-
1,4-Dichlorobenzene (µg/L)	4	**5.5**	**5.8**	<0.5	1.1	<0.5	3.6	0.6	-
Xylene, m-,p- (µg/L)	32	<0.5	<0.5	<0.5	<0.5	<0.5	**54.5**	4.6	-

NOTES:

1) All concentrations reported as mg/L unless indicated otherwise.
2) The PQWO of 0.02 mg/L is for un-ionized ammonia. The measured concentrations are for total ammonia.
3) Exceedances of the PWQO are shown in Bold.

2024 Unconfined Aquifer Water Quality - Key Indicator Parameters

Parameter[1]	PWQO	OW1-III [3]	OW4-II
Alkalinity	-	681	295
Chloride	-	96.2	8.3
Sodium	-	60.7	2.8
Iron	0.3	**10.5**	**0.7**
Manganese	-	1300	289
Potassium	-	5.84	5.74
Ammonia [2]	0.02 [2]	2.5	1.0
DOC	-	10.1	8.4
COD	-	70.1	39.7
Aluminum (µg/L)	75	4	19
Antimony	0.02	-	-
Cadmium (µg/L)	0.5	<0.005	0.02
Cobalt (µg/L)	0.9	1.4	0.2
Lead (µg/L)	5	0.08	0.12
Molybdenum	0.04	-	-
Nickel (µg/L)	25	3.6	0.8
Phosphorous	0.02	**1.29**	**0.14**
Zinc (µg/L)	20	7	5
Benzene (µg/L)	100	2	<0.2
Monochlorobenzene (µg/L)	15	2.8	<0.5
1,4-Dichlorobenzene (µg/L)	4	0.8	<0.5
Xylene, m-,p- (µg/L)	32	<0.5	<0.5

NOTES:

1) All concentrations reported as mg/L unless indicated otherwise.
2) The PQWO of 0.02 mg/L is for un-ionized ammonia. The measured concentrations are for total ammonia.
3) Peat Unit
4) Exceedances of the PWQO are shown in Bold.

Table 11
2024 Duplicate Water Quality Data

Parameter	23-Sep-24			24-Sep-24		
	OW4-I	OW504-I (Duplicate of OW4-I)	Relative Percent Difference (%)	OW2-II	OW2-IID (Duplicate of OW2-II)	Relative Percent Difference (%)
Hardness (as $CaCO_3$)	813	775	4.8%	599	587	2.0%
Alkalinity (as $CaCO_3$)	560	552	1.4%	725	726	0.1%
Conductivity	<1	<1	-	<1	<1	-
pH	6.72	6.68	0.6%	6.71	6.67	0.6%
Chloride	12	12	0.8%	44	46	4.5%
Nitrite (N)	<0.1	<0.1	-	<0.2	<0.05	-
Nitrate (N)	<0.1	<0.1	-	<0.2	<0.05	-
Sulphate	<1	<1	-	<2	<0.5	-
Calcium	173	173	0.0%	133	132	0.8%
Magnesium	22.3	21.4	4.1%	54.8	57.2	4.3%
Sodium	25.5	25.1	1.6%	49.5	49.0	1.0%
Potassium	3.09	2.90	6.3%	21.10	20.50	2.9%
Aluminum (µg/L)	3	3	0.0%	5	4	22.2%
Barium (µg/L)	1570	1540	1.9%	1900	1880	1.1%
Cadmium (µg/L)	0.038	0.031	20.3%	0.066	0.058	12.9%
Chromium (µg/L)	8.3	6.8	19.9%	10.1	8.5	17.2%
Cobalt (µg/L)	1.9	1.9	0.0%	14.9	13.2	12.1%
Copper (µg/L)	1.1	1	9.5%	3	2.4	22.2%
Iron (µg/L)	26100	25600	1.9%	50500	49100	2.8%
Lead (µg/L)	0.15	0.11	30.8%	0.15	0.11	30.8%
Manganese	459	455	0.9%	376	373	0.8%
Nickel (µg/L)	3.2	3.2	0.0%	16.3	15.8	3.1%
Selenium (µg/L)	0.49	1.07	74.4%	1.75	1.95	10.8%
Silver (µg/L)	<0.01	<0.01	-	0.01	0.01	0.0%
Zinc (µg/L)	8	8	0.0%	6	6	0.0%
Ammonia (N)-Total	1.23	1.41	13.6%	31.9	30.8	3.5%
Total Kjeldahl Nitrogen	1.6	1.9	17.1%	51.0	60.0	16.2%
o-Phosphate (P)	0.006	0.014	80.0%	<0.005	<0.005	-
Phosphorus-Total	0.45	0.31	36.2%	0.04	0.03	44.8%
Phenolics	0.001	0.001	9.5%	0.001	0.001	18.2%
Dissolved Organic Carbon	14.2	14.1	0.7%	18.4	18.7	1.6%
Dissolved Inorganic Carbon	143	136	5.0%	193	198	2.6%
Benzene	<0.2	0.3	-	1.3	1.2	8.0%
Monochlorobenzene	<0.5	<0.5	-	1.7	2.0	16.2%
1,2 - Dichlorobenzene	<0.5	<0.5	-	<0.5	<0.5	-
1,4 - Dichlorobenzene	<0.5	<0.5	-	1.1	0.7	44.4%
cis-1,2 - Dichloroethene	<0.5	<0.5	-	<0.5	<0.5	-
Trichloroethylene	<0.5	<0.5	-	<0.5	<0.5	-
Vinyl Chloride	<0.1	<0.1	-	<0.1	<0.1	-
m,p - Xylene	<0.5	<0.5	-	<0.5	<0.5	-

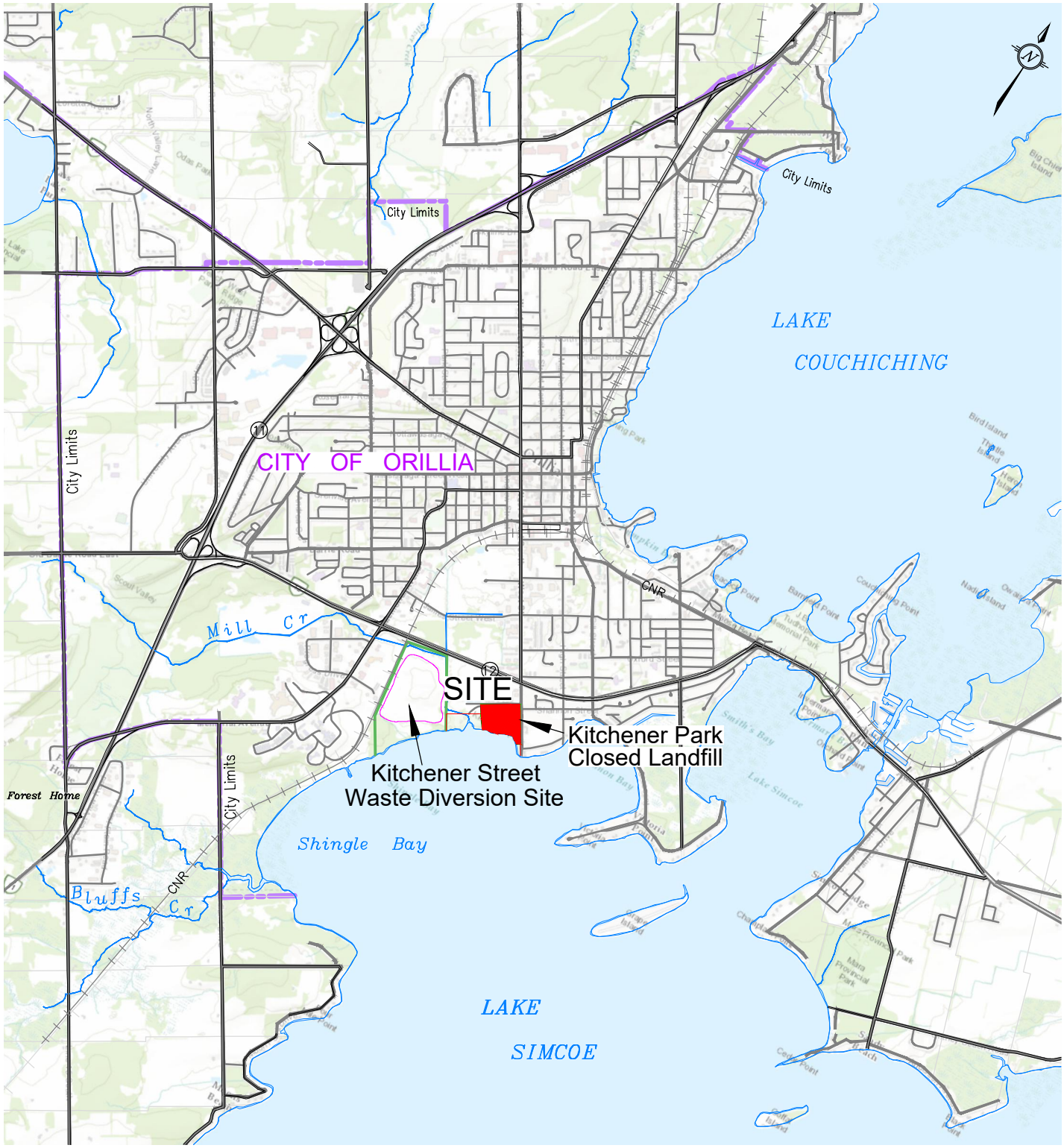
Table 12
Landfill Gas Monitoring Results

Monitoring Location	CH_4 % (v/v) [LEL = 5% CH4 (v/v)]																			
	22-Feb-17	22-Mar-17	17-Apr-17	29-Oct-17	24-Feb-18	19-Mar-18	26-Mar-18	15-Nov-18	26-Feb-19	02-Mar-19	26-Nov-19	06-Mar-20	05-Nov-20	09-Mar-21	30-Nov-21	27-Feb-22	27-Nov-22	14-Mar-23	22-Nov-23	23-Feb-24	12-Nov-24
GP-KP2	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
GP-KP3	0.0	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GP-KP4	0.0	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
GP-KP7	**46.7**	-	-	**65.3**	**61.4**	-	-	**56.6**	**-**	**48.4**	**21.1**	**28.9**	**60.5**	**28.4**	**44.6**	**12.6**	**39.1**	**17.8**	**78.0**	**57.7**	**30.8**
GP-KP8	3.6	-	-	1.1	4.4	-	-	**8.2**	**-**	4.6	**8.1**	**6.6**	**25.7**	**23.2**	**17.4**	**14.7**	**16.1**	0.6	**42.3**	0.4	**19.7**
GP-KP9	0.9	-	-	1.3	0.5	-	-	0.5	-	0.4	0.6	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0	0.2	0
GP-KP10	0.2	0.0	0.0	0.0	0.3	-	-	0.1	-	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
GP-KP11	-	0.0	0.0	0.0	0.4	-	-	0.0	-	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-	-	-	-
GP-KP12	-	-	-	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
GP-KP13	-	-	-	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GP-KP14	-	-	-	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GP-KP15	-	-	-	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OW3	0.0	-	-	0.1	0.0	-	-	0.1	-	0.1	0.0	**5.1**	**16.9**	**15.8**	**6.1**	**7.1**	**7.4**	0.8	**17.2**	**7.3**	**1.4**
OW6-II	0.0	-	-	**6.5**	4.8	-	-	**6.1**	**-**	4.4	2.5	3.1	2.6	3.9	2.9	0.9	4.9	3.1	0.6	**6.4**	**29.5**
OW8	1.2	-	-	**13.9**	**27.7**	-	-	**25.3**	**-**	**18.1**	**6.3**	**6.1**	**9.3**	4.8	4.7	4.2	2.8	0.2	0.3	**9.5**	**40.1**

NOTES:

1) The lower explosive limit (LEL) for methane is 5% CH_4 (v/v). Exceedances of the LEL are shown in bold.

Figures



City of Orillia Limits

0 500 1000 2000 3000

SCALE 1:50000 metres

Base from Licensed EMR Digital 1:50000 Topographic Sheet 31D/11

CLIENT
CITY OF ORILLIA

PROJECT
KITCHENER PARK CLOSED LANDFILL
2024 ANNUAL MONITORING REPORT

CONSULTANT
wsp

YYYY-MM-DD	2025-03-19
DESIGNED	
PREPARED	JPR
REVIEWED	BG
APPROVED	

TITLE
REGIONAL LOCATION MAP

PROJECT NO.	CONTROL	REV.	FIGURE
22578520	0004	----	1

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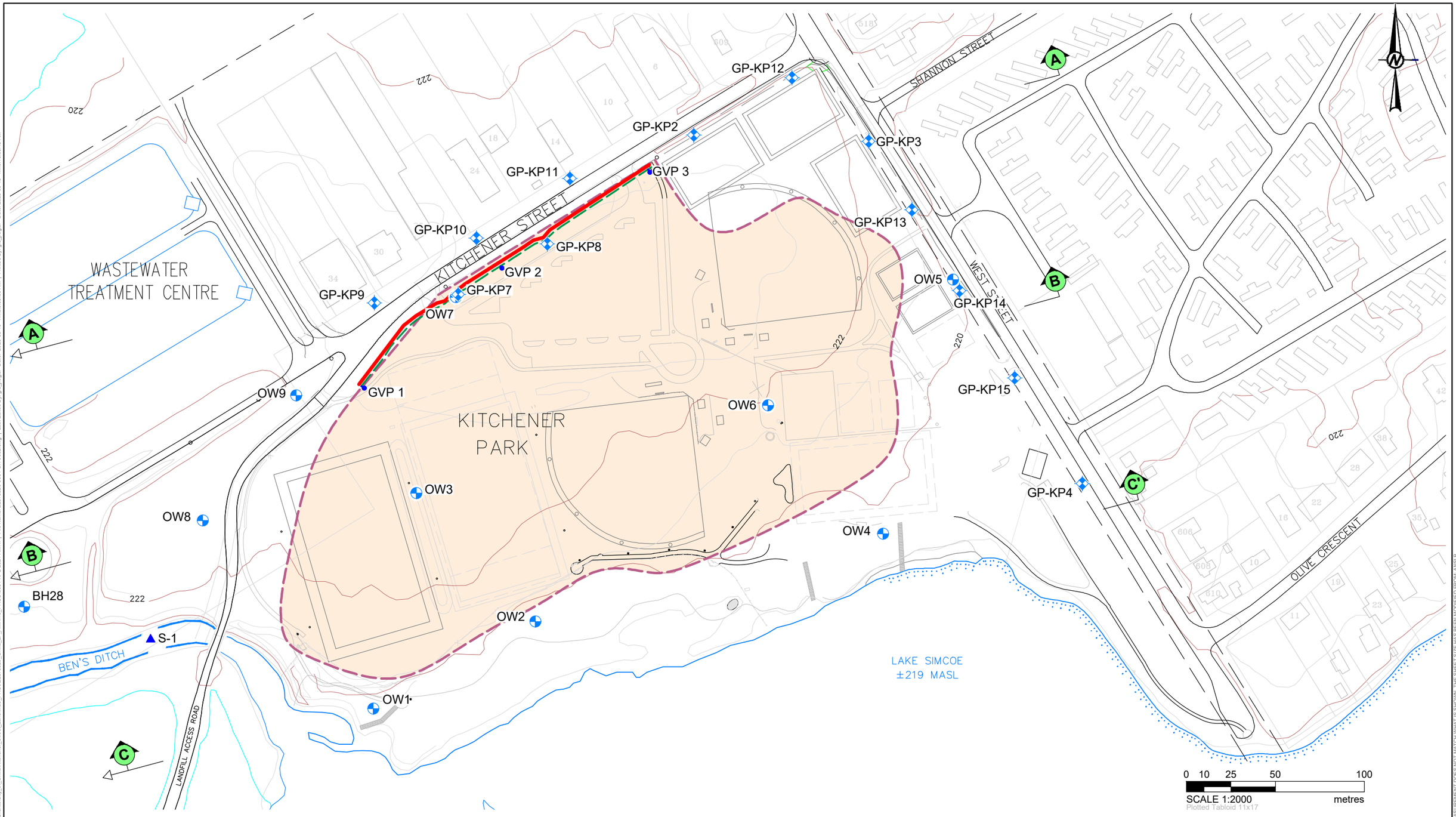

LEGEND

- SHORELINE
- ESTIMATED EXTENT OF LANDFILL
- SHEET PILE WALL LANDFILL GAS BARRIER ALIGNMENT
- VENTING TRENCH CENTERLINE ALIGNMENT
- GAS VENTING POLE CONNECTED TO VENTING TRENCH (3 TOTAL)
- WETLAND
- LINE OF SECTION
- SURFACE MONITORING LOCATION
- OBSERVATION WELL
- GAS PROBE

CLIENT
CITY OF ORILLIA

CONSULTANT
wsp

YYYY-MM-DD	2025-03-19
DESIGNED	
PREPARED	JPR
REVIEWED	BG
APPROVED	

PROJECT
KITCHENER PARK CLOSED LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE
SITE LOCATION MAP

PROJECT NO.	CONTROL	REV.	FIGURE
22578520	0004	----	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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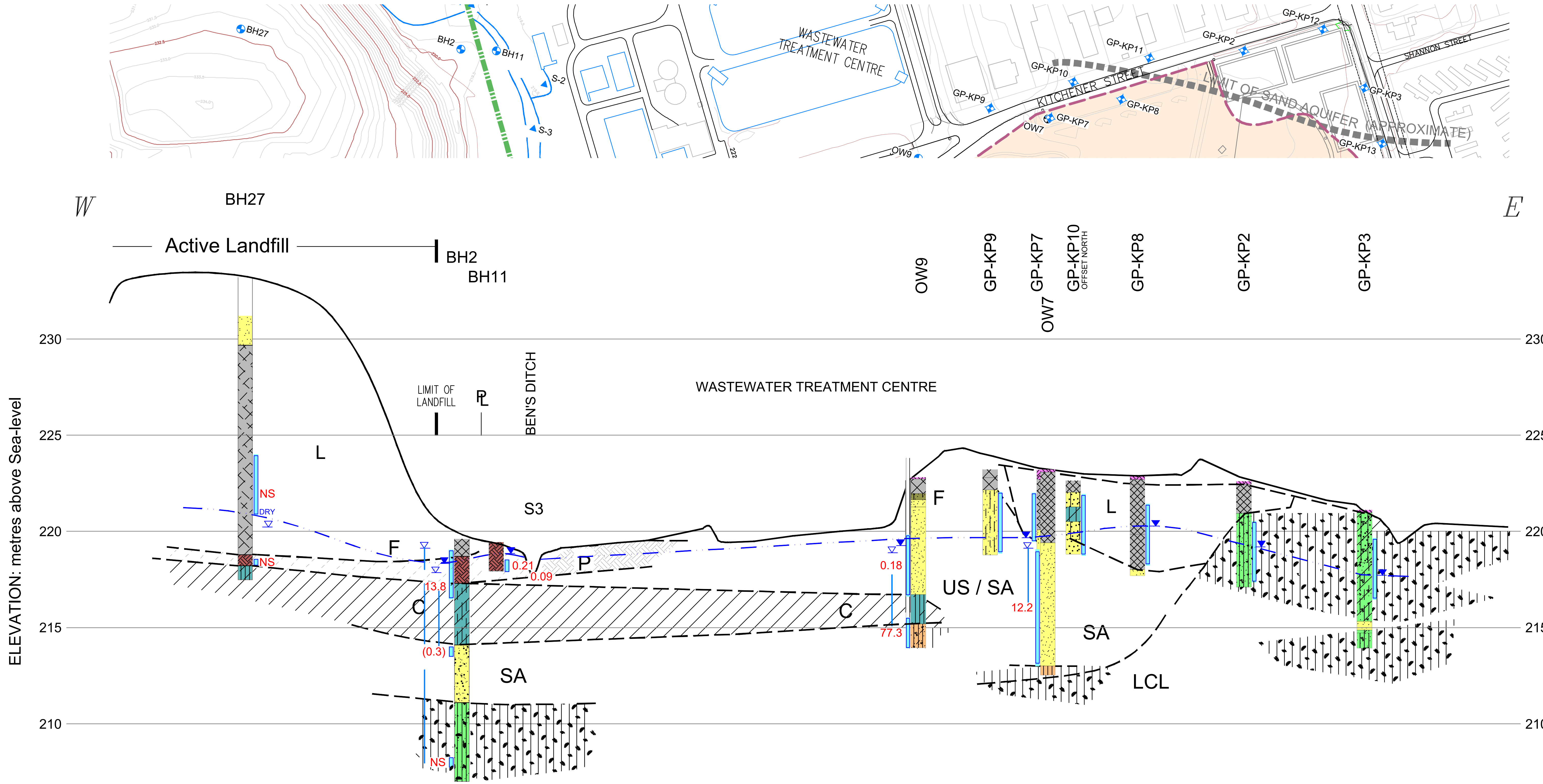

- Static Water Level Fall 2024
- Sand Aquifer Water Level Fall 2024
- 12 Ammonia Concentration Fall 2024 (mg/L)
- (12) Ammonia Concentration Prior to Fall 2024 (mg/L)

0 25 50 100 250

SCALE 1:3000 metres

Plotted Tabloid 11x17

See Figure 2 for Section Line

See Figure 6 for Hydrogeological Symbols

CLIENT
CITY OF ORILLIA

CONSULTANT
wsp

YYYY-MM-DD	2025-03-19
DESIGNED	
PREPARED	JPR
REVIEWED	BG
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PROJECT
KITCHENER PARK CLOSED LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE
SITE SECTION A - A'

PROJECT NO.	CONTROL	REV.	FIGURE
22578520	0004	----	3

W

E

BH3

BH28

OW8

OW3

OW6

OW5
GP-KP14

ACTIVE LANDFILL

EXTENDED

LIMIT OF LANDFILL

WASTEWATER TREATMENT CENTRE

BEN'S DITCH

LIMIT OF WASTE

FILL & WASTE

ELEVATION: metres above Sea-level

230

225

220

215

210

205

L

F

C

P

SA

LCL

344

0.46

40.2

3.88

3.78

14.9

24.8

30.1

NS

0.52

Static Water Level Fall 2024

Sand Aquifer Water Level Fall 2024

12 Ammonia Concentration Fall 2024 (mg/L)

0 25 50 100 250

SCALE 1:3000 metres

Plotted Tabloid 11x17

See Figure 2 for Section Line

See Figure 6 for Hydrogeological Symbols

CLIENT
CITY OF ORILLIA

CONSULTANT
wsp

YYYY-MM-DD	2025-03-19
DESIGNED	
PREPARED	JPR
REVIEWED	BG
APPROVED	

PROJECT
KITCHENER PARK CLOSED LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE
SITE SECTION B - B'

PROJECT NO.	CONTROL	REV.	FIGURE
22578520	0004	----	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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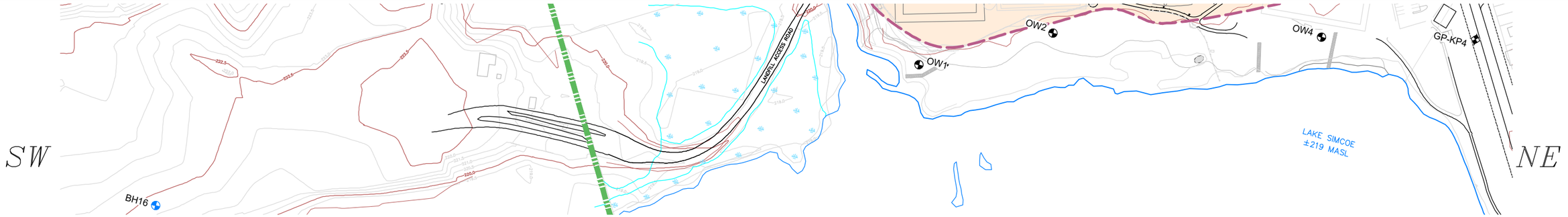
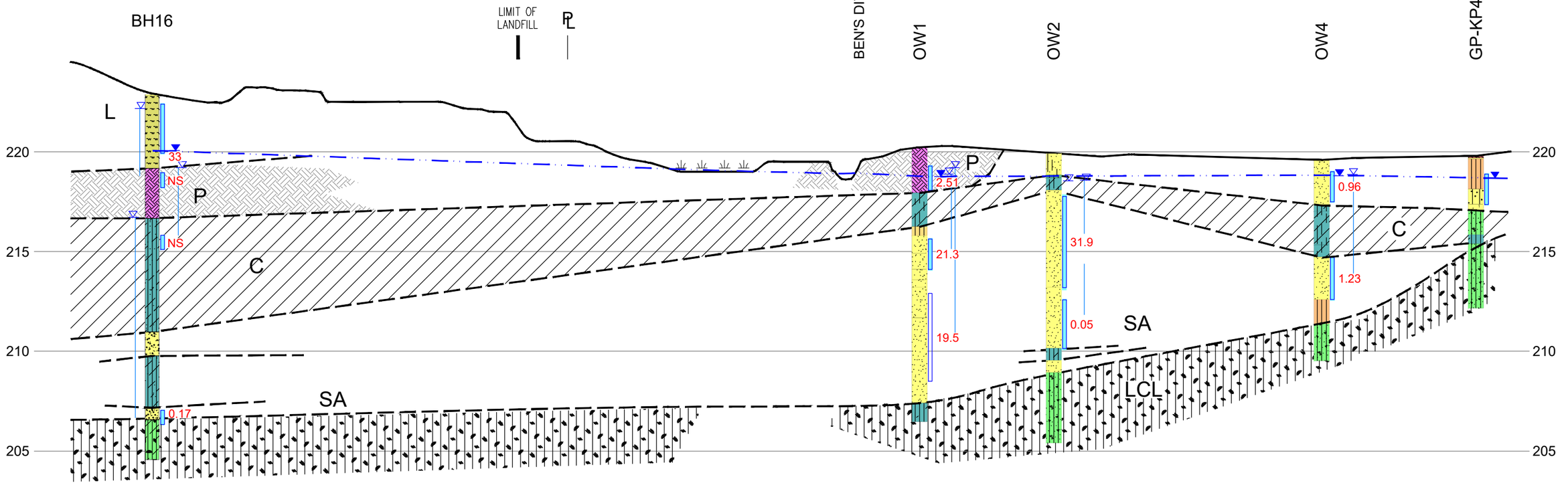


KITCHENER STREET LANDFILL

WASTEWATER TREATMENT CENTRE



Static Water Level Fall 2024

Sand Aquifer Water Level Fall 2024

12 Ammonia Concentration Fall 2024 (mg/L)

0 25 50 100 250

SCALE 1:3000 metres

Plotted Tabloid 11x17

See Figure 2 for Section Line

See Figure 6 for Hydrogeological Symbols

CLIENT
CITY OF ORILLIA

CONSULTANT
wsp

YYYY-MM-DD	2025-03-19
DESIGNED	
PREPARED	JPR
REVIEWED	BG
APPROVED	

PROJECT
KITCHENER PARK CLOSED LANDFILL
2024 ANNUAL MONITORING REPORT

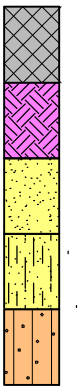
TITLE
SITE SECTION C - C'

PROJECT NO.	CONTROL	REV.	FIGURE
22578520	0004	----	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

SYMBOLS



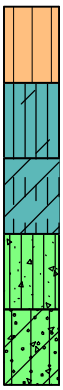
FILL/OVERBURDEN

ORGANICS/TOPSOIL

SAND

SILTY SAND

SANDY SILT



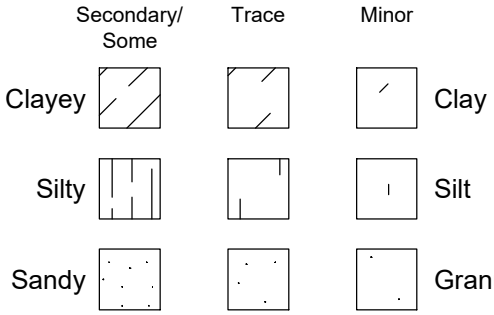
SILT

CLAYEY SILT

SILTY CLAY

GRANULAR TILL

CLAY / SILT TILL



Screen

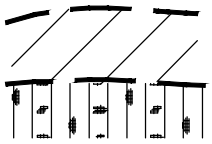
Upper Peat and Landfill Water Level

Sand Aquifer Static Water Level

12 Ammonia Concentration

LEGEND

UNIT	DESCRIPTION
L	Landfill (Refuse)
F	Fill
P	Peat
US	Upper Sand (Water Table)
C	Confining Layer
SA	Sand Aquifer (Lower Units Potential)
LCL	Lower Till Confining Layer



Generally indicating Aquifer

Inferred Hydrostratigraphic Contact

Generally indicating Confining Material

Generally Indicating Till

NOTE: On all sections, boundaries between soil strata have been determined only at well and test well locations. Between the wells and test wells, boundaries are not proven, but are inferred from geological evidence.

CLIENT
CITY OF ORILLIA

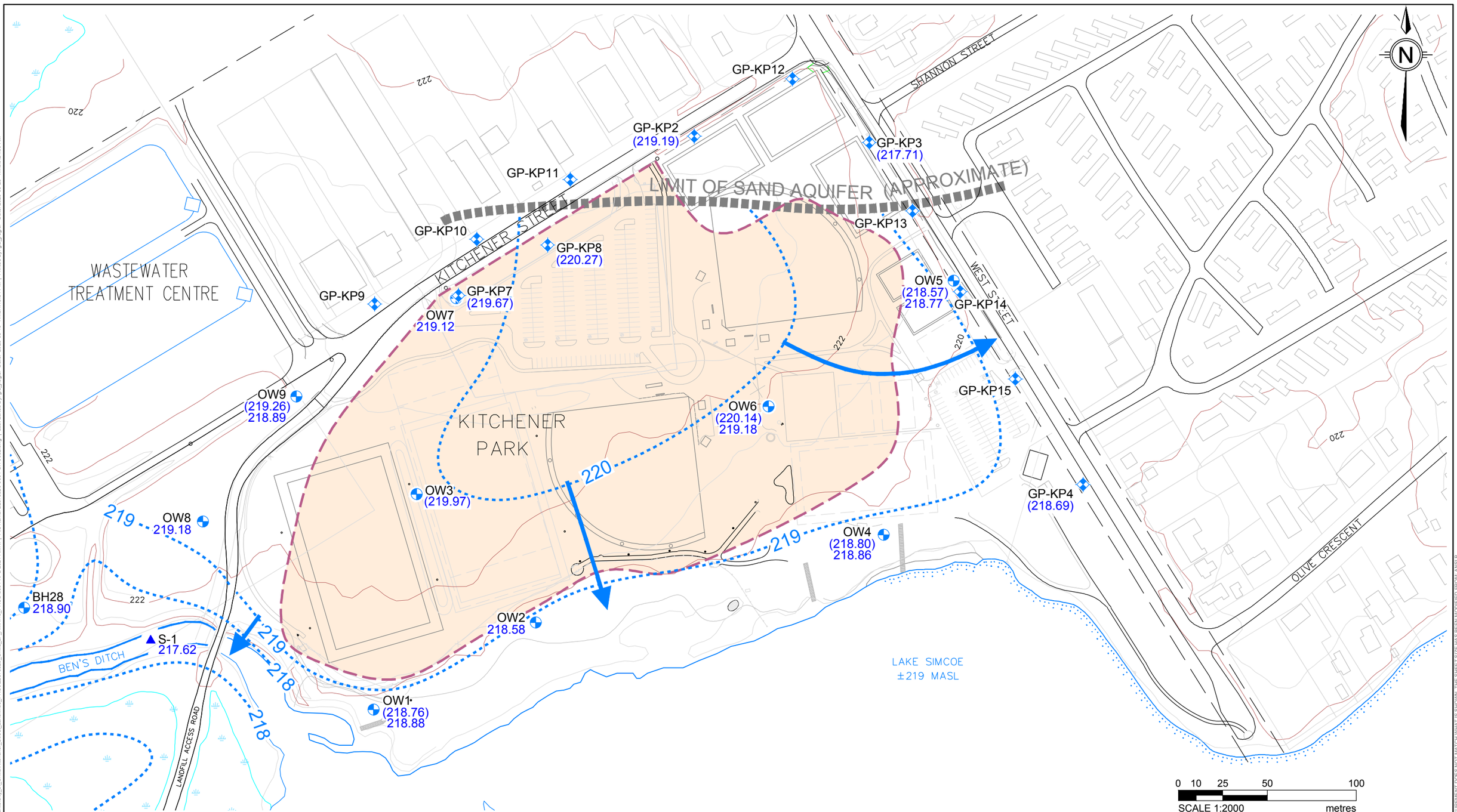
PROJECT
KITCHENER PARK CLOSED LANDFILL
2024 ANNUAL MONITORING REPORT

CONSULTANT
wsp

YYYY-MM-DD	2025-03-19
DESIGNED	
PREPARED	JPR
REVIEWED	BG
APPROVED	

TITLE
HYDROGEOLOGICAL SYMBOLS

PROJECT NO.	CONTROL	REV.	FIGURE
22578520	0004	----	6



LEGEND

- SHORELINE
- WETLAND
- (219.03) SURFICIAL UNITS WATER LEVEL ELEVATION (masl)*
- 219.03 SAND AQUIFER WATER LEVEL ELEVATION (masl)
- UPPER AQUIFER EQUIPOTENTIAL CONTOUR (masl)
- ESTIMATED EXTENT OF FORMER LANDFILL
- SURFACE MONITORING LOCATION
- OBSERVATION WELL
- GAS PROBE

*NOTE: GROUNDWATER FLOW REFLECTS GRADIENTS MOUNDED IN UPPER SURFICIAL UNITS TO SAND AQUIFER POTENTIOMETRIC FLOW.

CLIENT
CITY OF ORILLIA

CONSULTANT
wsp

YYYY-MM-DD	2025-03-19
DESIGNED	
PREPARED	JPR
REVIEWED	JER
APPROVED	

PROJECT
KITCHENER PARK CLOSED LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE
UPPER AQUIFER GROUNDWATER SURFACE FALL 2024

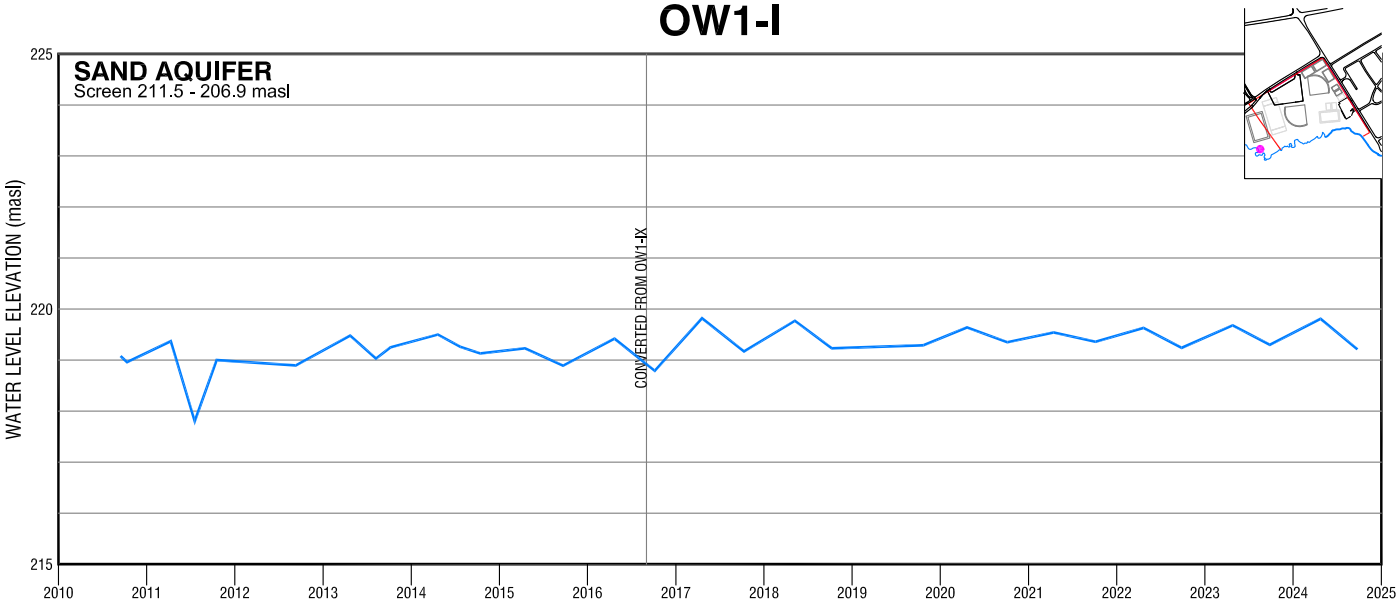
PROJECT NO.	CONTROL	REV.	FIGURE
22578520	0004	----	7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

APPENDIX A

Water Level Hydrographs

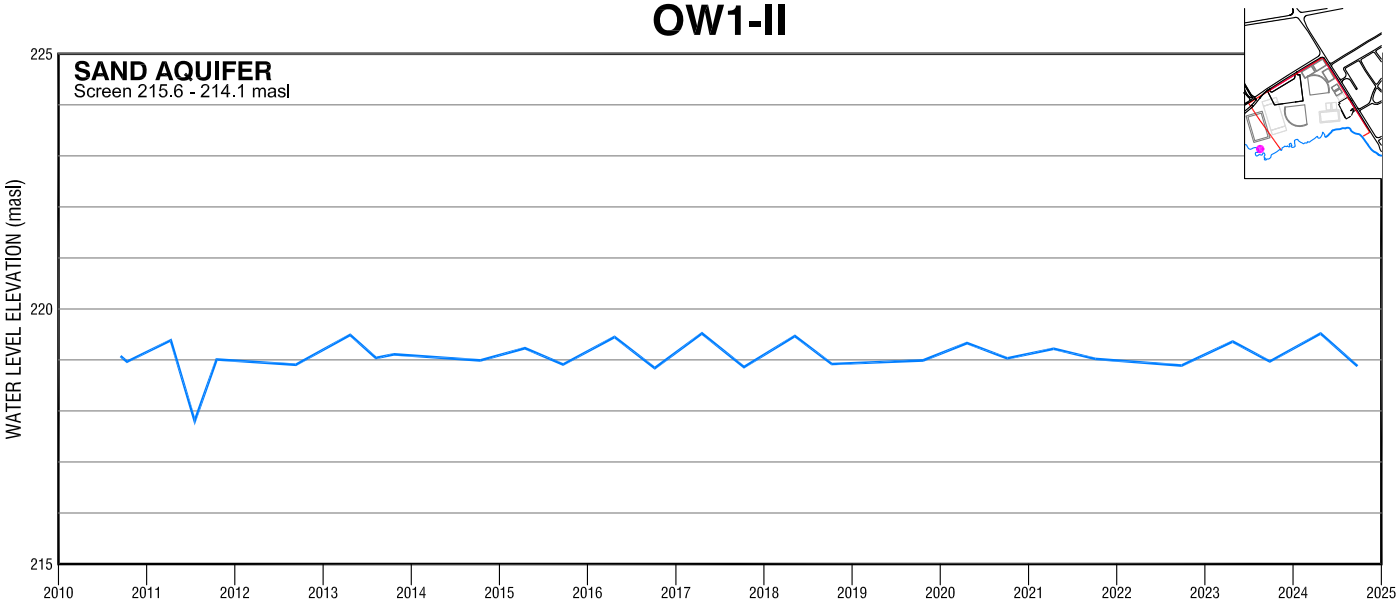
OW1-I



MP Elevation 220.36 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.08	24-Jul-14	219.26	23-Oct-19	219.29	24-Sep-24	219.21				
12-Oct-10	218.96	14-Oct-14	219.13	21-Apr-20	219.64						
11-Apr-11	219.37	17-Apr-15	219.23	05-Oct-20	219.35						
19-Jul-11	217.80	22-Sep-15	218.89	15-Apr-21	219.54						
18-Oct-11	219.00	22-Apr-16	219.42	05-Oct-21	219.36						
10-Sep-12	218.90	06-Oct-16	218.79	22-Apr-22	219.63						
23-Apr-13	219.48	19-Apr-17	219.82	27-Sep-22	219.24						
08-Aug-13	219.03	10-Oct-17	219.17	26-Apr-23	219.68						
07-Oct-13	219.25	09-May-18	219.77	27-Sep-23	219.30						
21-Apr-14	219.50	09-Oct-18	219.23	24-Apr-24	219.81						

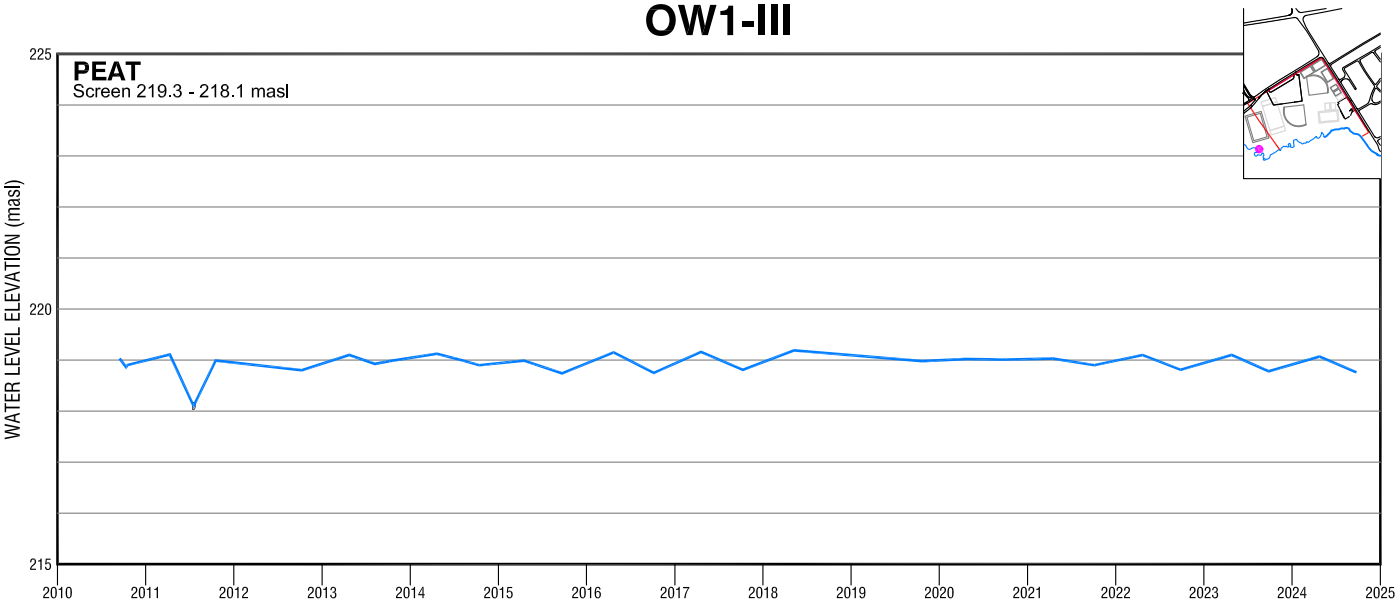
OW1-II



MP Elevation 220.22 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.07	17-Apr-15	219.23	05-Oct-20	219.03						
12-Oct-10	218.96	22-Sep-15	218.91	15-Apr-21	219.22						
11-Apr-11	219.38	22-Apr-16	219.45	05-Oct-21	219.02						
19-Jul-11	217.80	06-Oct-16	218.84	27-Sep-22	218.89						
18-Oct-11	219.01	19-Apr-17	219.52	26-Apr-23	219.36						
10-Sep-12	218.90	10-Oct-17	218.86	27-Sep-23	218.97						
23-Apr-13	219.49	09-May-18	219.47	24-Apr-24	219.52						
08-Aug-13	219.04	09-Oct-18	218.92	24-Sep-24	218.88						
21-Oct-13	219.11	22-Oct-19	218.99								
14-Oct-14	218.99	21-Apr-20	219.33								

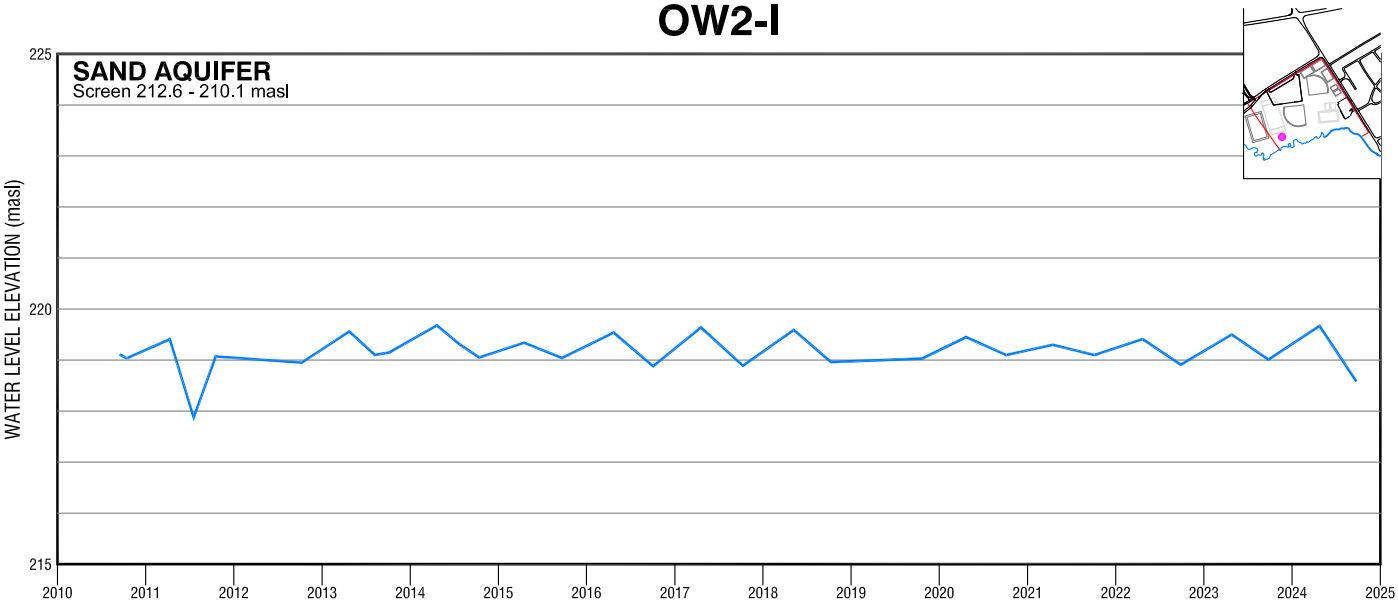
OW1-III



MP Elevation 220.17 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.03	21-Apr-14	219.13	22-Oct-19	218.98	24-Sep-24	218.76				
12-Oct-10	218.86	24-Jul-14	219.01	21-Apr-20	219.02						
18-Oct-10	218.90	14-Oct-14	218.90	05-Oct-20	219.01						
11-Apr-11	219.11	17-Apr-15	218.99	15-Apr-21	219.03						
19-Jul-11	DRY	22-Sep-15	218.74	05-Oct-21	218.90						
18-Oct-11	218.99	22-Apr-16	219.15	22-Apr-22	219.10						
09-Oct-12	218.80	06-Oct-16	218.75	27-Sep-22	218.81						
23-Apr-13	219.10	19-Apr-17	219.16	26-Apr-23	219.10						
08-Aug-13	218.93	10-Oct-17	218.81	27-Sep-23	218.78						
07-Oct-13	218.98	09-May-18	219.19	24-Apr-24	219.07						

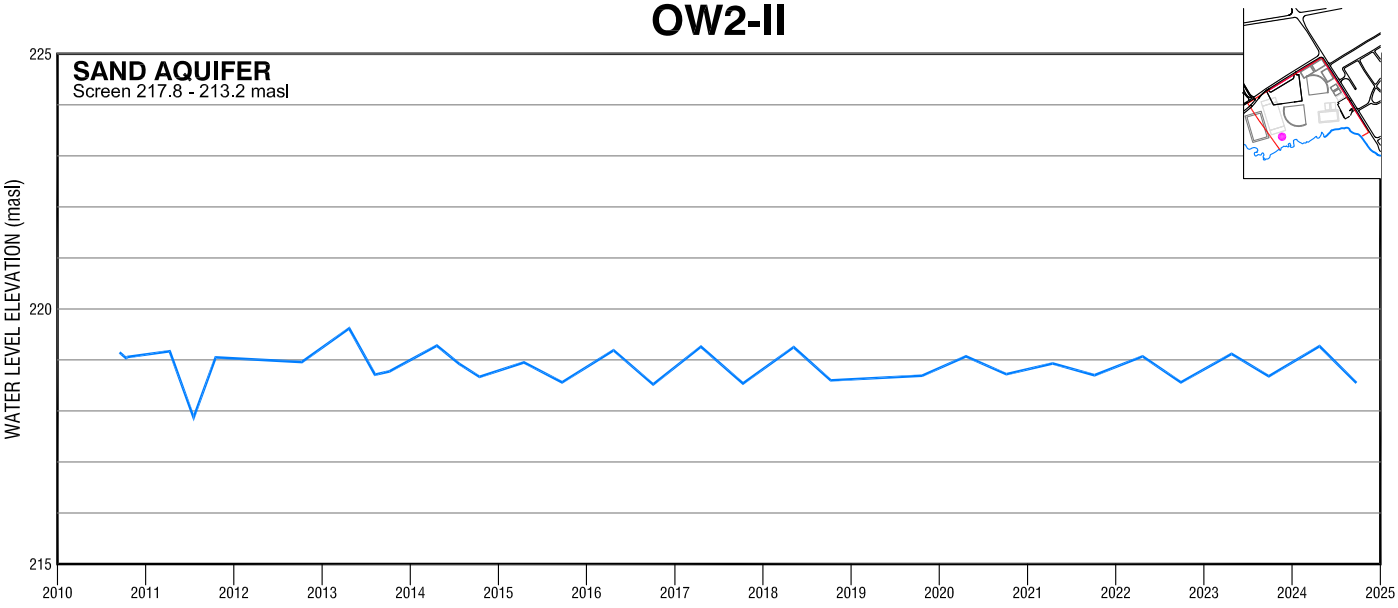
OW2-I



MP Elevation 220.84 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.11	21-Apr-14	219.68	10-Oct-18	218.96	26-Sep-23	219.01				
12-Oct-10	219.04	24-Jul-14	219.31	22-Oct-19	219.03	24-Apr-24	219.67				
18-Oct-10	219.04	14-Oct-14	219.05	23-Oct-19	219.03	24-Sep-24	218.58				
11-Apr-11	219.41	17-Apr-15	219.34	21-Apr-20	219.45						
19-Jul-11	217.88	22-Sep-15	219.04	05-Oct-20	219.10						
18-Oct-11	219.07	22-Apr-16	219.54	15-Apr-21	219.30						
09-Oct-12	218.95	03-Oct-16	218.88	05-Oct-21	219.10						
23-Apr-13	219.56	19-Apr-17	219.64	22-Apr-22	219.41						
08-Aug-13	219.10	10-Oct-17	218.89	28-Sep-22	218.91						
07-Oct-13	219.15	08-May-18	219.59	26-Apr-23	219.50						

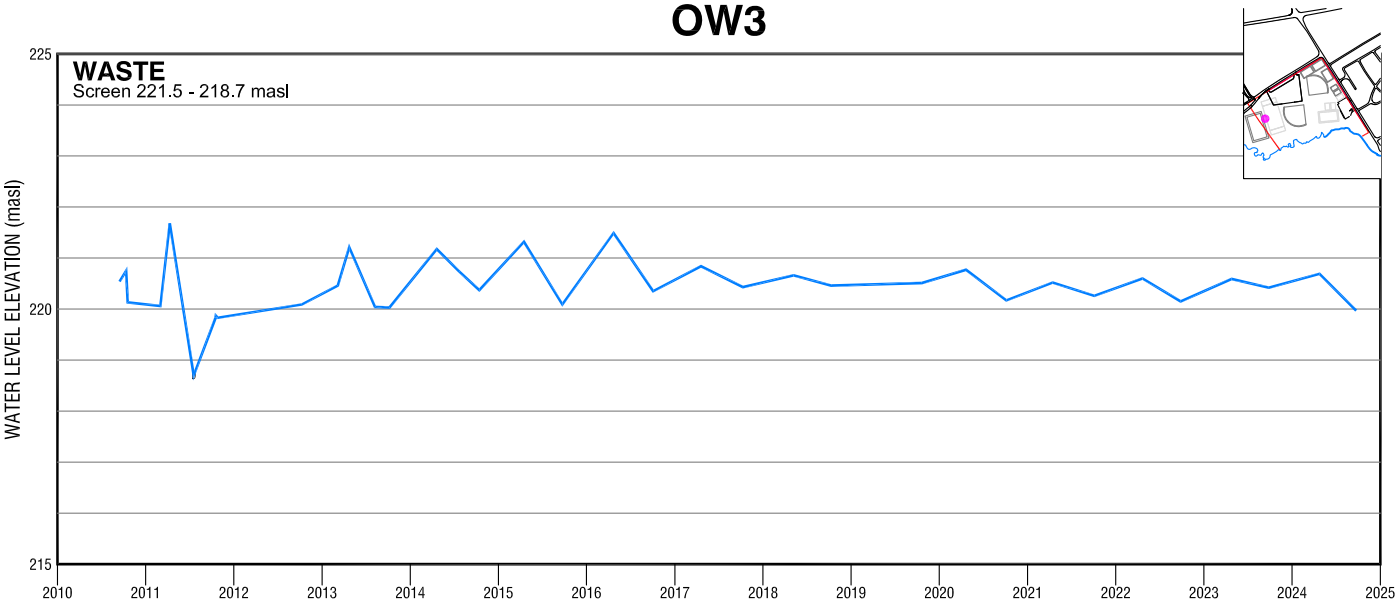
OW2-II



MP Elevation 220.49 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.15	21-Apr-14	219.28	09-Oct-18	218.60	24-Apr-24	219.27				
12-Oct-10	219.04	24-Jul-14	218.92	22-Oct-19	218.69	24-Sep-24	218.55				
18-Oct-10	219.06	15-Oct-14	218.67	21-Apr-20	219.07						
11-Apr-11	219.17	17-Apr-15	218.95	05-Oct-20	218.72						
19-Jul-11	217.87	22-Sep-15	218.56	15-Apr-21	218.93						
18-Oct-11	219.05	22-Apr-16	219.19	05-Oct-21	218.70						
09-Oct-12	218.96	03-Oct-16	218.52	22-Apr-22	219.07						
23-Apr-13	219.62	19-Apr-17	219.26	28-Sep-22	218.56						
08-Aug-13	218.71	10-Oct-17	218.54	26-Apr-23	219.12						
07-Oct-13	218.77	08-May-18	219.25	27-Sep-23	218.68						

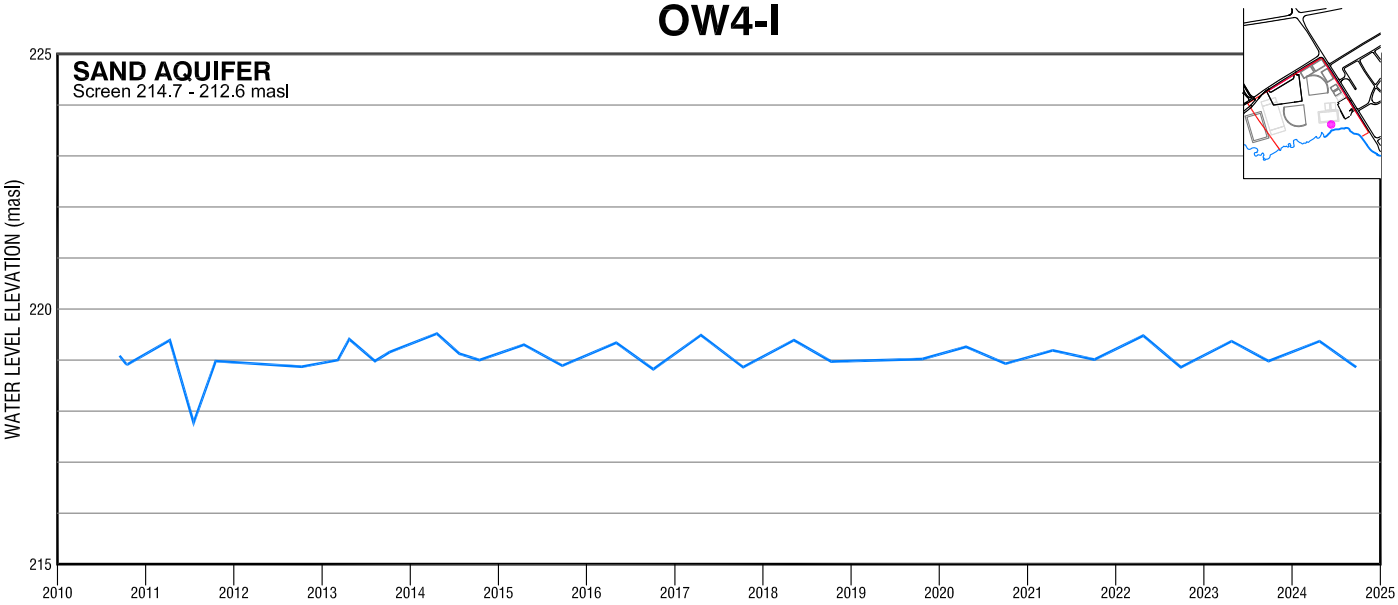
OW3



MP Elevation 224.19 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	220.54	07-Mar-13	220.46	03-Oct-16	220.35	22-Apr-22	220.60				
12-Oct-10	220.75	23-Apr-13	221.21	19-Apr-17	220.84	27-Sep-22	220.15				
19-Oct-10	220.13	08-Aug-13	220.04	10-Oct-17	220.43	26-Apr-23	220.59				
03-Mar-11	220.06	07-Oct-13	220.03	08-May-18	220.66	27-Sep-23	220.42				
11-Apr-11	221.68	21-Apr-14	221.18	10-Oct-18	220.46	24-Apr-24	220.69				
19-Jul-11	DRY	24-Jul-14	220.73	21-Oct-19	220.51	23-Sep-24	219.97				
18-Oct-11	219.83	14-Oct-14	220.37	21-Apr-20	220.77						
19-Oct-11	219.87	17-Apr-15	221.32	05-Oct-20	220.17						
27-Oct-11	219.83	23-Sep-15	220.09	15-Apr-21	220.52						
09-Oct-12	220.09	22-Apr-16	221.49	04-Oct-21	220.26						

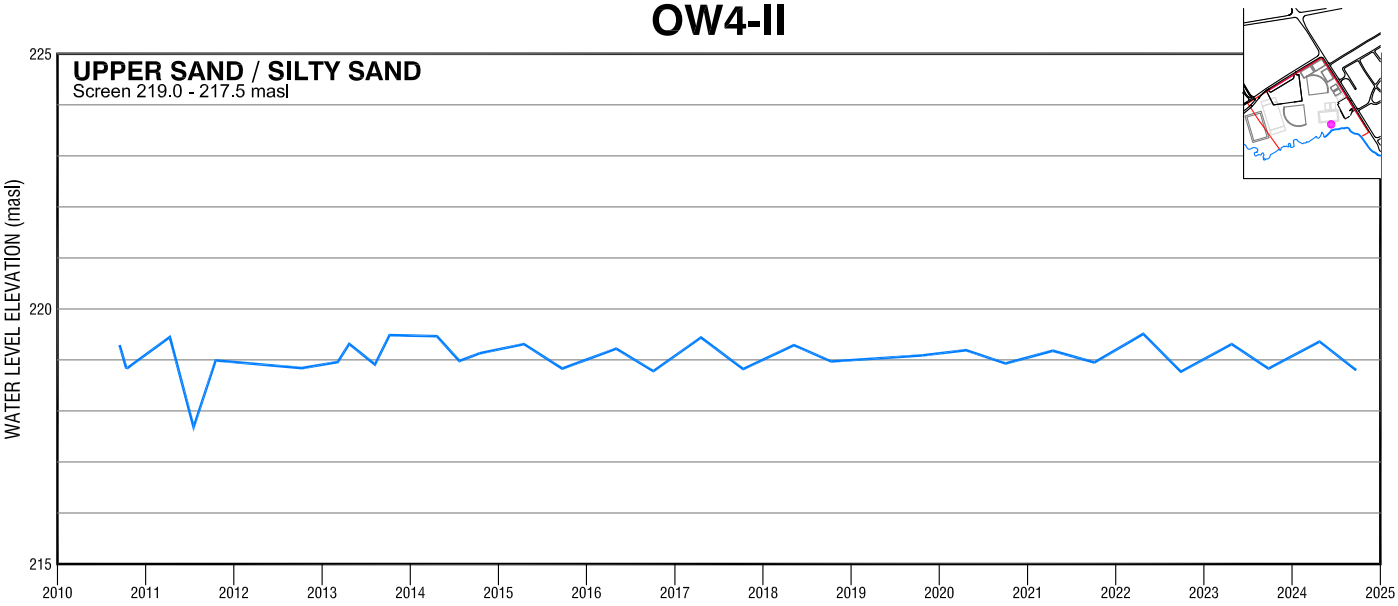
OW4-I



MP Elevation 220.51 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.09	07-Oct-13	219.15	09-May-18	219.39	26-Sep-23	218.98				
12-Oct-10	218.93	21-Apr-14	219.52	11-Oct-18	218.97	24-Apr-24	219.37				
18-Oct-10	218.91	24-Jul-14	219.13	23-Oct-19	219.02	23-Sep-24	218.86				
11-Apr-11	219.39	15-Oct-14	219.00	21-Apr-20	219.26						
19-Jul-11	217.77	17-Apr-15	219.30	02-Oct-20	218.93						
18-Oct-11	218.98	23-Sep-15	218.89	15-Apr-21	219.19						
09-Oct-12	218.87	03-May-16	219.34	05-Oct-21	219.01						
07-Mar-13	219.00	04-Oct-16	218.82	25-Apr-22	219.48						
23-Apr-13	219.41	19-Apr-17	219.49	28-Sep-22	218.86						
08-Aug-13	218.98	11-Oct-17	218.86	26-Apr-23	219.37						

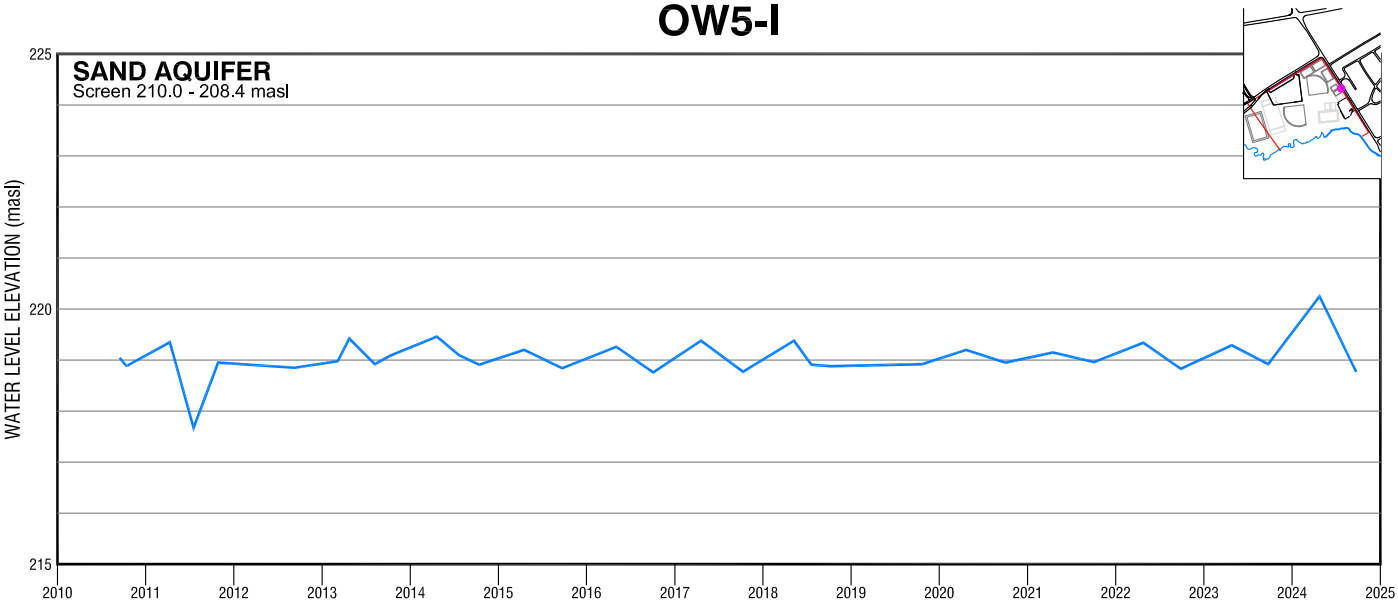
OW4-II



MP Elevation 220.44 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.29	07-Oct-13	219.49	09-May-18	219.29	26-Sep-23	218.83				
12-Oct-10	218.85	21-Apr-14	219.46	11-Oct-18	218.97	24-Apr-24	219.36				
18-Oct-10	218.84	24-Jul-14	218.98	23-Oct-19	219.09	23-Sep-24	218.80				
11-Apr-11	219.45	15-Oct-14	219.13	21-Apr-20	219.19						
19-Jul-11	217.68	17-Apr-15	219.31	02-Oct-20	218.93						
18-Oct-11	218.99	23-Sep-15	218.83	15-Apr-21	219.18						
09-Oct-12	218.84	03-May-16	219.22	05-Oct-21	218.95						
07-Mar-13	218.96	04-Oct-16	218.78	25-Apr-22	219.51						
23-Apr-13	219.32	19-Apr-17	219.44	28-Sep-22	218.77						
08-Aug-13	218.91	11-Oct-17	218.82	26-Apr-23	219.31						

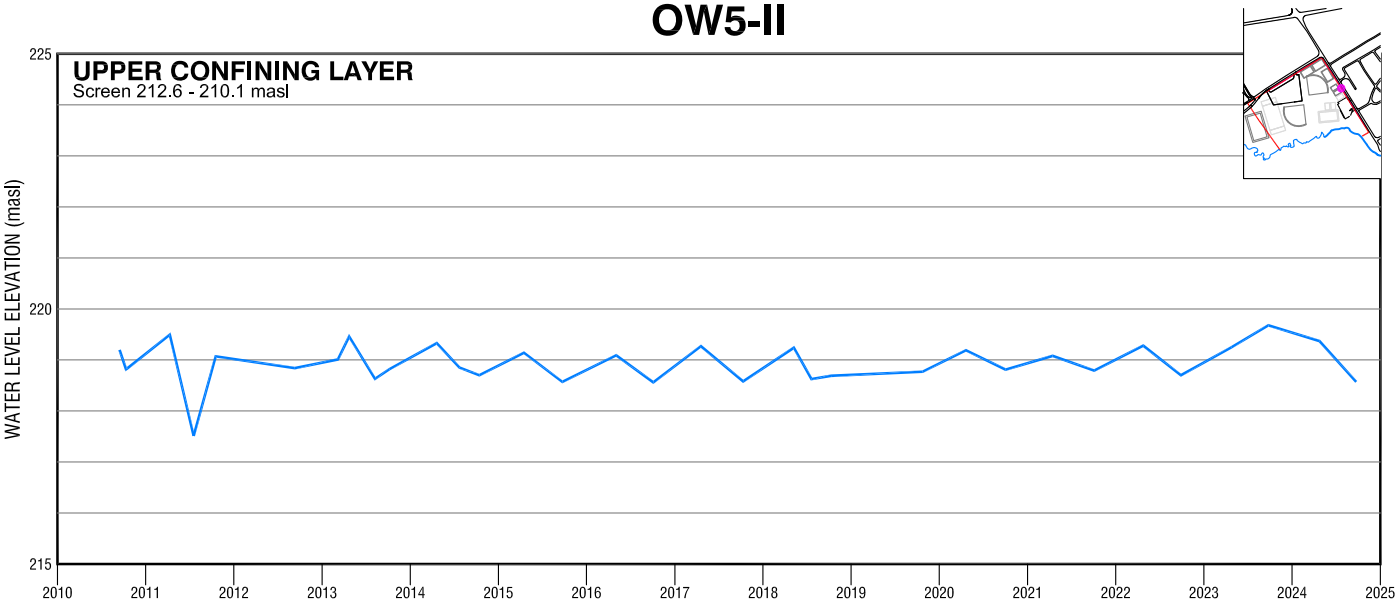
OW5-I



MP Elevation 221.36 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.04	07-Oct-13	219.08	09-May-18	219.38	26-Apr-23	219.29				
12-Oct-10	218.89	21-Apr-14	219.46	21-Jul-18	218.91	25-Sep-23	218.92				
18-Oct-10	218.89	24-Jul-14	219.09	10-Oct-18	218.88	24-Apr-24	220.25				
11-Apr-11	219.35	14-Oct-14	218.91	23-Oct-19	218.92	23-Sep-24	218.77				
19-Jul-11	217.67	17-Apr-15	219.20	21-Apr-20	219.20						
28-Oct-11	218.95	23-Sep-15	218.84	02-Oct-20	218.95						
10-Sep-12	218.85	03-May-16	219.26	15-Apr-21	219.15						
07-Mar-13	218.98	04-Oct-16	218.76	04-Oct-21	218.96						
23-Apr-13	219.42	19-Apr-17	219.38	25-Apr-22	219.34						
08-Aug-13	218.92	11-Oct-17	218.77	28-Sep-22	218.83						

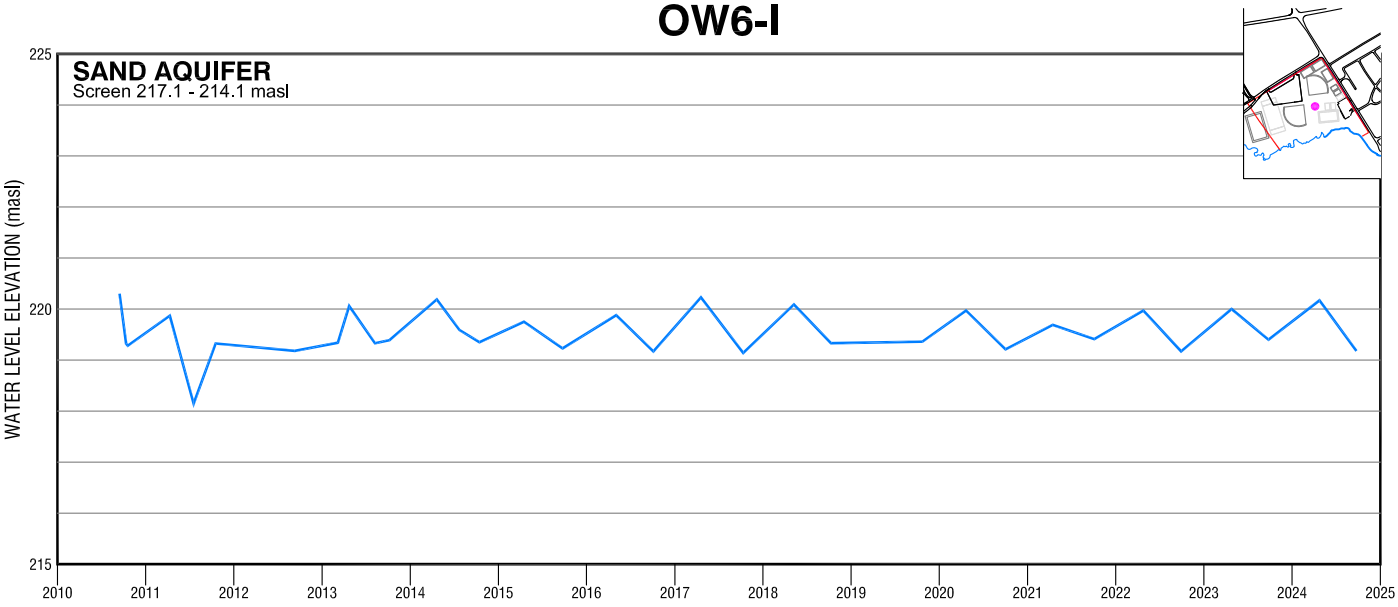
OW5-II



MP Elevation 221.27 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.20	07-Oct-13	218.82	09-May-18	219.24	26-Apr-23	219.25				
12-Oct-10	218.82	21-Apr-14	219.33	21-Jul-18	218.63	25-Sep-23	219.68				
18-Oct-10	218.84	24-Jul-14	218.85	10-Oct-18	218.69	24-Apr-24	219.37				
11-Apr-11	219.49	14-Oct-14	218.70	24-Oct-19	218.77	23-Sep-24	218.57				
19-Jul-11	217.51	17-Apr-15	219.14	21-Apr-20	219.19						
18-Oct-11	219.07	23-Sep-15	218.57	02-Oct-20	218.81						
10-Sep-12	218.84	03-May-16	219.09	15-Apr-21	219.08						
07-Mar-13	219.01	04-Oct-16	218.56	04-Oct-21	218.79						
23-Apr-13	219.46	19-Apr-17	219.27	25-Apr-22	219.28						
08-Aug-13	218.63	11-Oct-17	218.58	28-Sep-22	218.70						

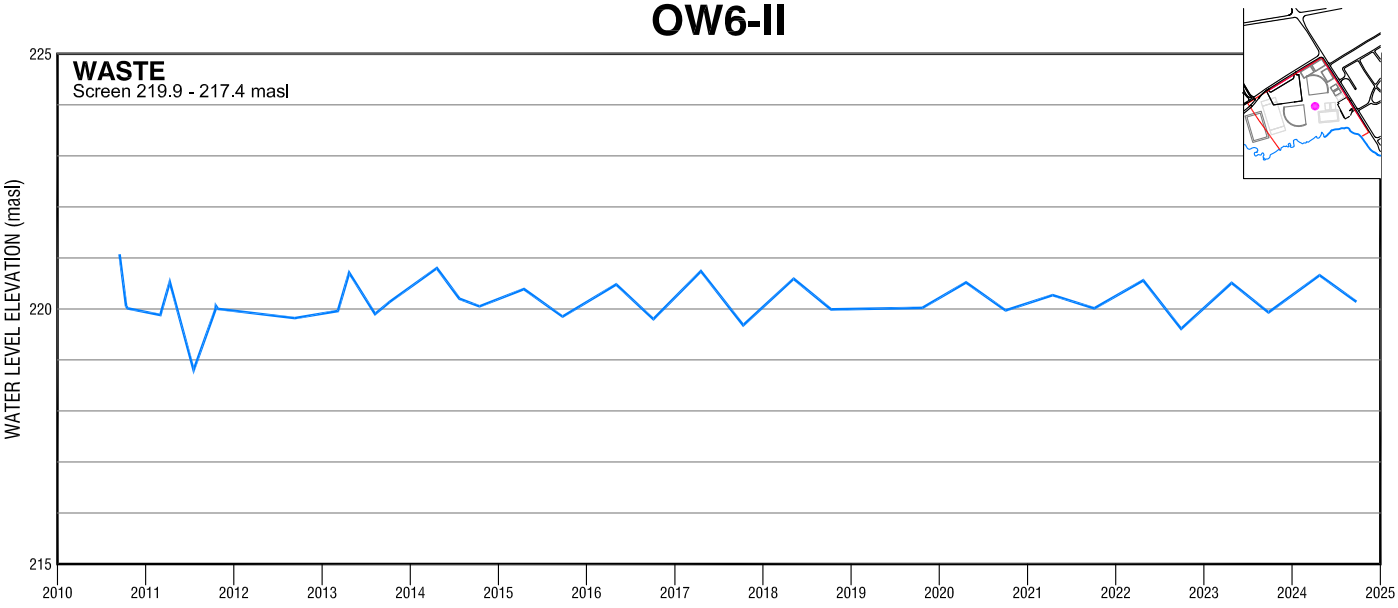
OW6-I



MP Elevation 222.42 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	220.30	07-Oct-13	219.39	09-May-18	220.09	26-Sep-23	219.40				
12-Oct-10	219.32	21-Apr-14	220.19	10-Oct-18	219.33	24-Apr-24	220.17				
19-Oct-10	219.28	24-Jul-14	219.59	23-Oct-19	219.36	24-Sep-24	219.18				
11-Apr-11	219.87	15-Oct-14	219.35	21-Apr-20	219.97						
19-Jul-11	218.15	17-Apr-15	219.75	02-Oct-20	219.21						
18-Oct-11	219.32	24-Sep-15	219.23	15-Apr-21	219.69						
10-Sep-12	219.18	03-May-16	219.88	04-Oct-21	219.41						
07-Mar-13	219.34	04-Oct-16	219.17	25-Apr-22	219.97						
23-Apr-13	220.06	19-Apr-17	220.23	29-Sep-22	219.17						
08-Aug-13	219.33	11-Oct-17	219.14	26-Apr-23	220.00						

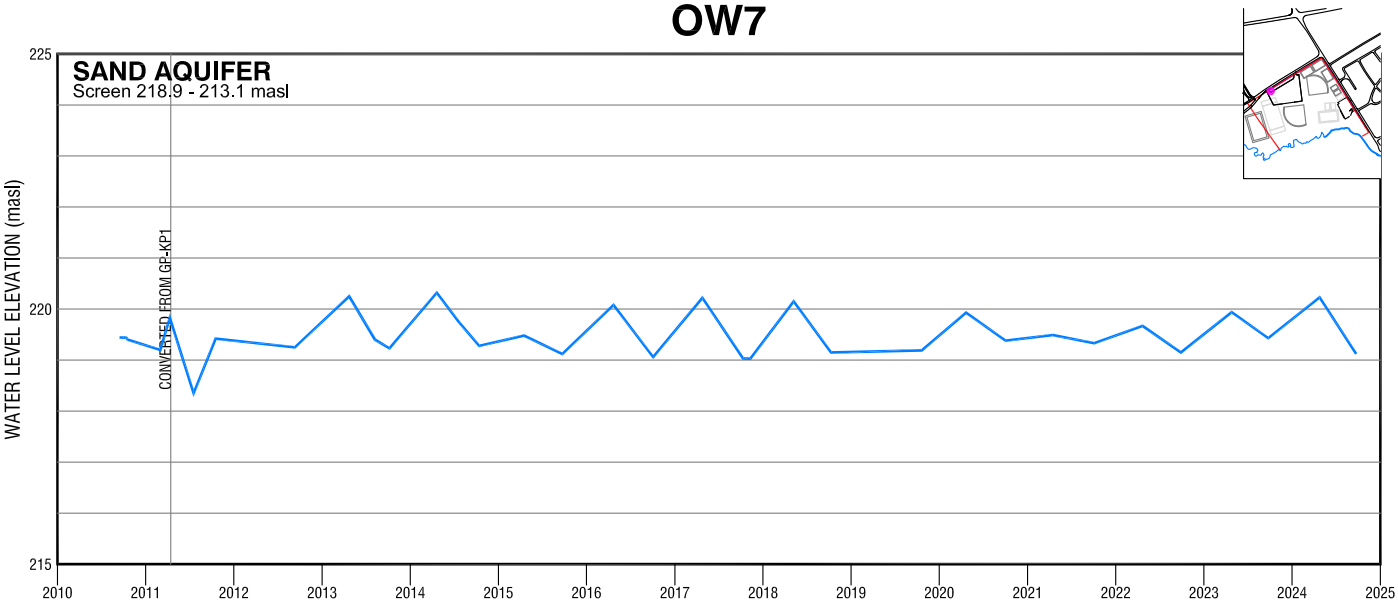
OW6-II



MP Elevation 222.42 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	221.07	07-Mar-13	219.96	04-Oct-16	219.80	25-Apr-22	220.56				
12-Oct-10	220.05	23-Apr-13	220.71	19-Apr-17	220.74	29-Sep-22	219.61				
19-Oct-10	220.01	08-Aug-13	219.90	11-Oct-17	219.68	26-Apr-23	220.51				
03-Mar-11	219.88	07-Oct-13	220.13	08-May-18	220.59	26-Sep-23	219.93				
11-Apr-11	220.53	21-Apr-14	220.80	10-Oct-18	219.99	24-Apr-24	220.66				
19-Jul-11	218.80	24-Jul-14	220.20	23-Oct-19	220.02	24-Sep-24	220.14				
18-Oct-11	220.00	15-Oct-14	220.05	21-Apr-20	220.52						
19-Oct-11	220.06	17-Apr-15	220.39	02-Oct-20	219.97						
28-Oct-11	220.00	24-Sep-15	219.85	15-Apr-21	220.27						
10-Sep-12	219.82	03-May-16	220.48	04-Oct-21	220.01						

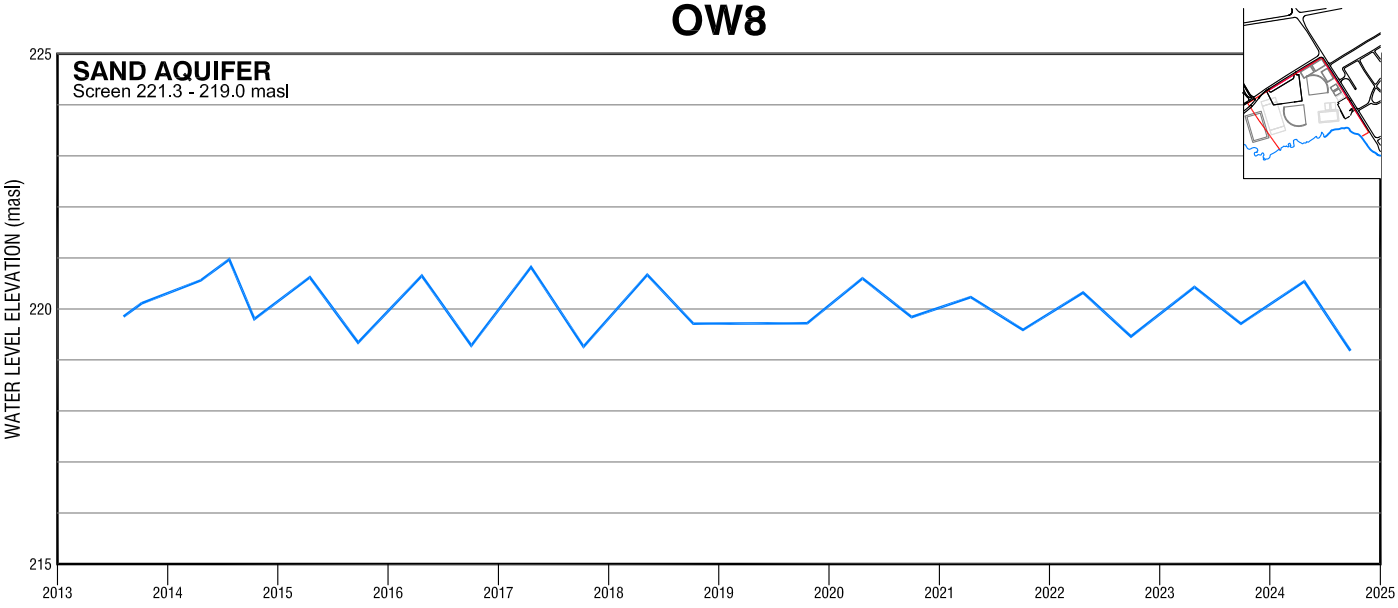
OW7



MP Elevation 224.09 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
15-Sep-10	219.44	07-Oct-13	219.23	10-Nov-17	219.03	26-Apr-23	219.94				
12-Oct-10	219.44	21-Apr-14	220.32	08-May-18	220.15	25-Sep-23	219.43				
19-Oct-10	219.40	24-Jul-14	219.73	10-Oct-18	219.15	24-Apr-24	220.23				
03-Mar-11	219.20	14-Oct-14	219.28	21-Oct-19	219.19	23-Sep-24	219.12				
11-Apr-11	219.83	17-Apr-15	219.48	21-Apr-20	219.93						
19-Jul-11	218.35	23-Sep-15	219.12	02-Oct-20	219.38						
18-Oct-11	219.42	22-Apr-16	220.08	15-Apr-21	219.49						
10-Sep-12	219.25	03-Oct-16	219.06	04-Oct-21	219.33						
23-Apr-13	220.25	25-Apr-17	220.22	22-Apr-22	219.67						
08-Aug-13	219.40	11-Oct-17	219.03	28-Sep-22	219.15						

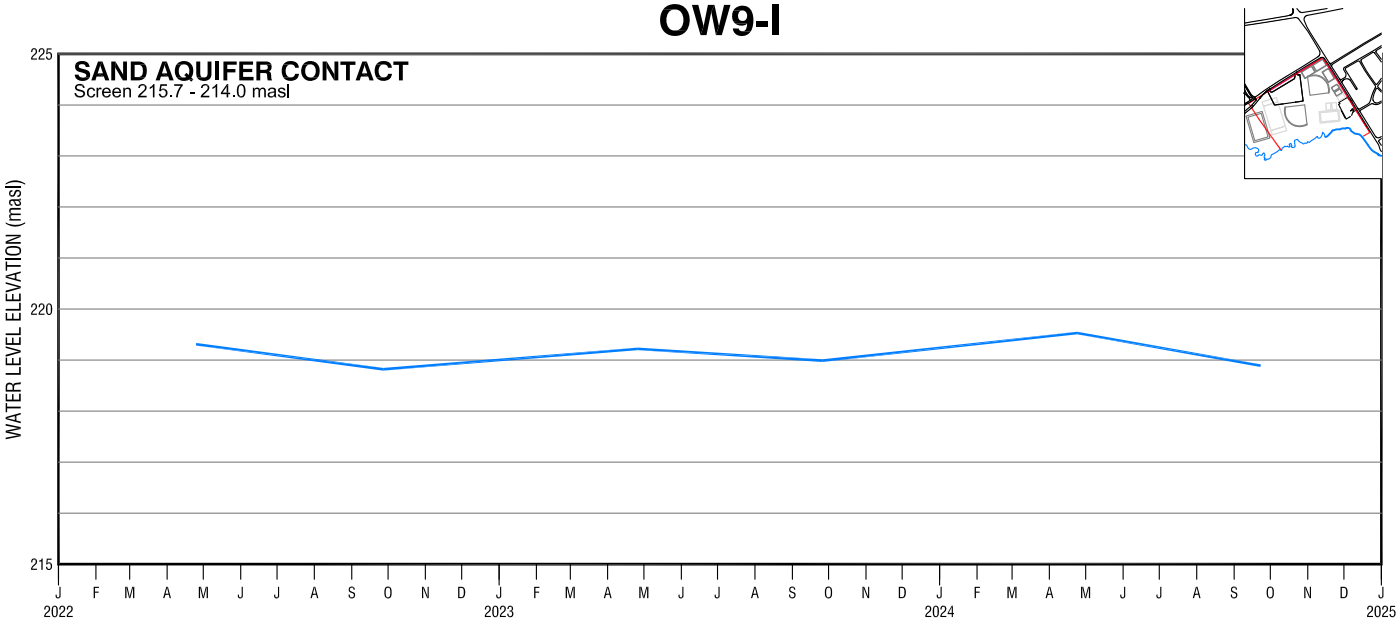
OW8



MP Elevation 223.17 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
08-Aug-13	219.85	10-Oct-17	219.26	26-Apr-23	220.43						
07-Oct-13	220.11	09-May-18	220.67	27-Sep-23	219.71						
21-Apr-14	220.56	09-Oct-18	219.71	24-Apr-24	220.54						
24-Jul-14	220.97	21-Oct-19	219.72	24-Sep-24	219.18						
15-Oct-14	219.80	21-Apr-20	220.60								
17-Apr-15	220.62	01-Oct-20	219.84								
24-Sep-15	219.34	15-Apr-21	220.23								
22-Apr-16	220.65	05-Oct-21	219.59								
03-Oct-16	219.28	22-Apr-22	220.32								
19-Apr-17	220.82	28-Sep-22	219.46								

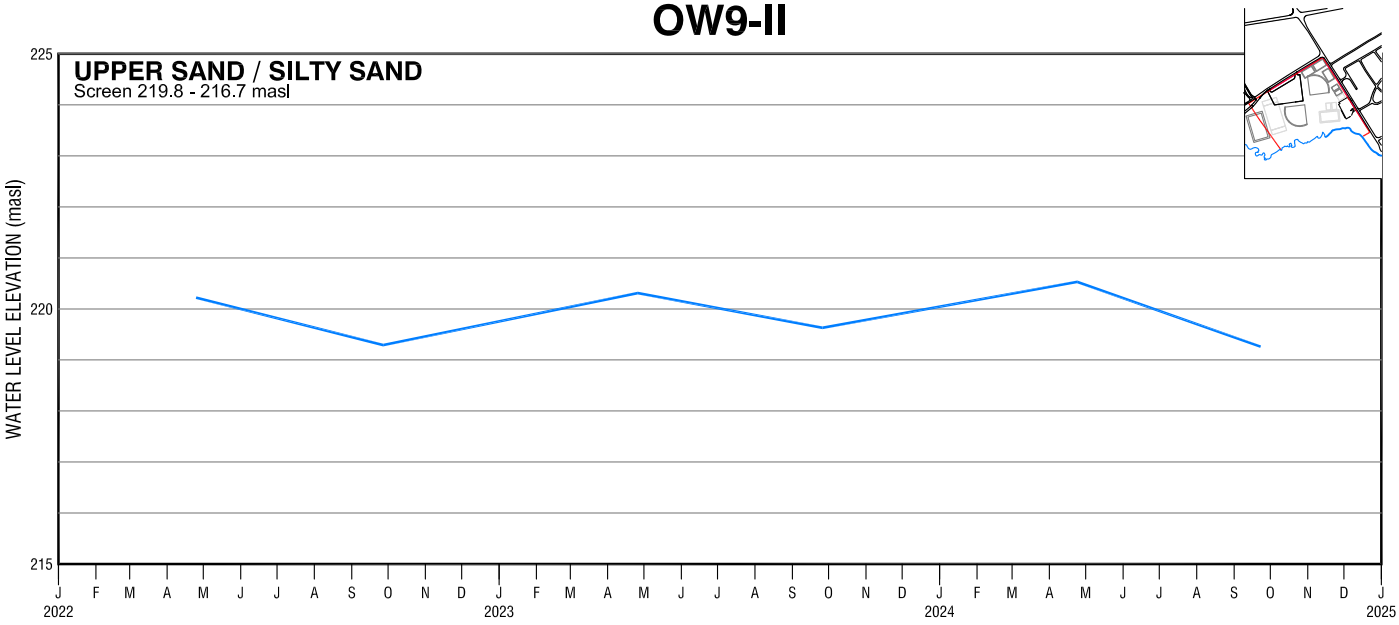
OW9-I



MP Elevation 223.74 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
25-Apr-22	219.31										
27-Sep-22	218.82										
26-Apr-23	219.22										
26-Sep-23	218.99										
24-Apr-24	219.53										
23-Sep-24	218.89										

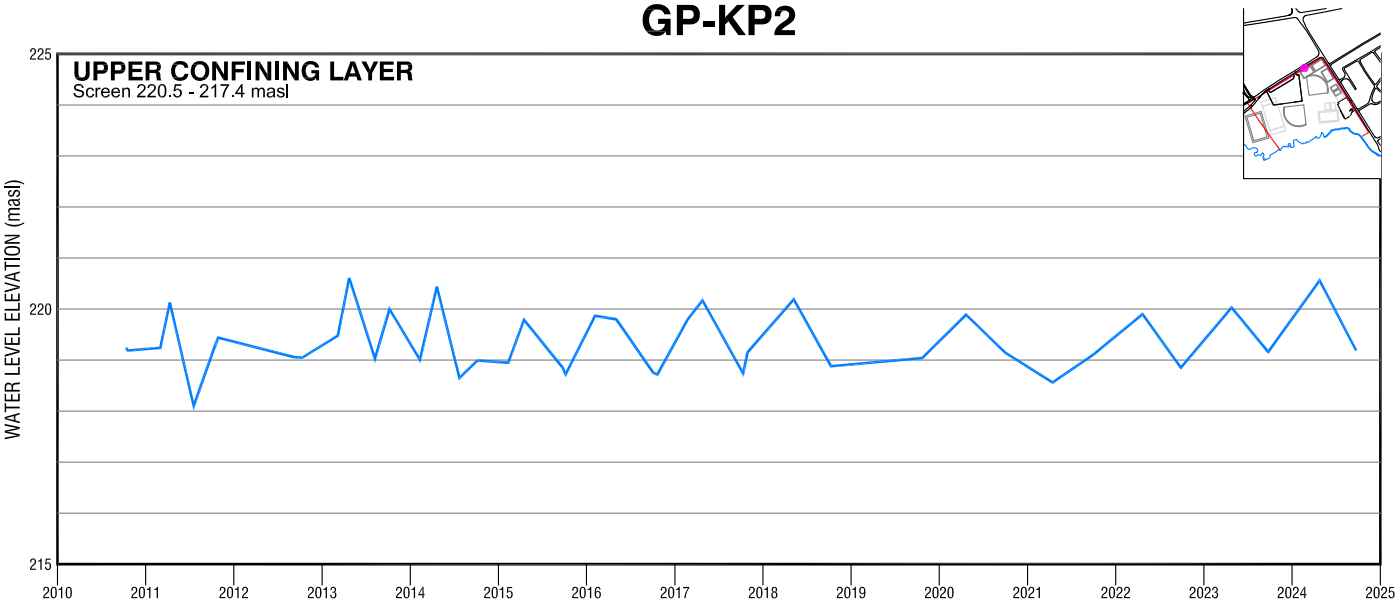
OW9-II



MP Elevation 223.87 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
25-Apr-22	220.22										
27-Sep-22	219.29										
26-Apr-23	220.31										
26-Sep-23	219.63										
24-Apr-24	220.53										
23-Sep-24	219.26										

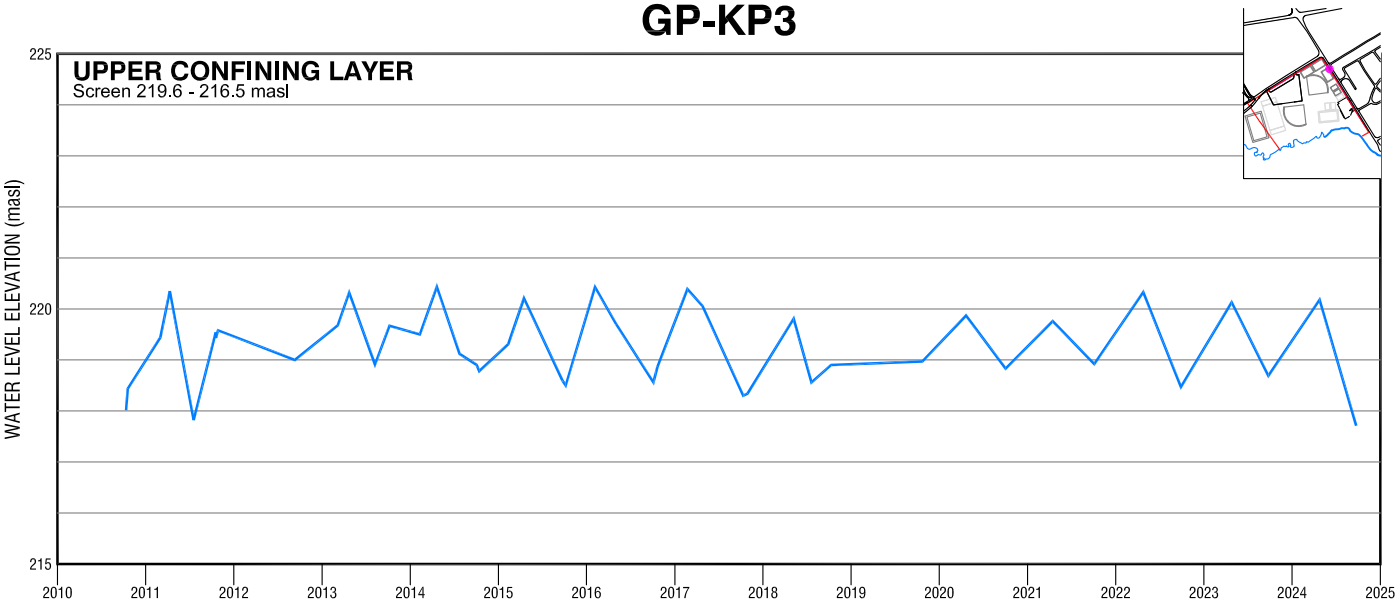
GP-KP2



MP Elevation 223.45 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
12-Oct-10	219.25	07-Mar-13	219.48	17-Apr-15	219.79	29-Oct-17	219.15	26-Apr-23	220.03		
19-Oct-10	219.19	23-Apr-13	220.61	23-Sep-15	218.86	08-May-18	220.19	25-Sep-23	219.16		
03-Mar-11	219.24	08-Aug-13	219.03	07-Oct-15	218.72	10-Oct-18	218.88	24-Apr-24	220.56		
11-Apr-11	220.13	07-Oct-13	220.00	05-Feb-16	219.87	23-Oct-19	219.04	23-Sep-24	219.19		
19-Jul-11	218.10	10-Feb-14	219.01	03-May-16	219.80	21-Apr-20	219.89				
18-Oct-11	219.32	21-Apr-14	220.44	04-Oct-16	218.75	02-Oct-20	219.14				
19-Oct-11	219.31	24-Jul-14	218.65	21-Oct-16	218.72	15-Apr-21	218.56				
28-Oct-11	219.44	03-Oct-14	218.98	22-Feb-17	219.79	04-Oct-21	219.12				
10-Sep-12	219.05	14-Oct-14	218.99	25-Apr-17	220.17	22-Apr-22	219.90				
12-Oct-12	219.05	11-Feb-15	218.95	11-Oct-17	218.74	28-Sep-22	218.85				

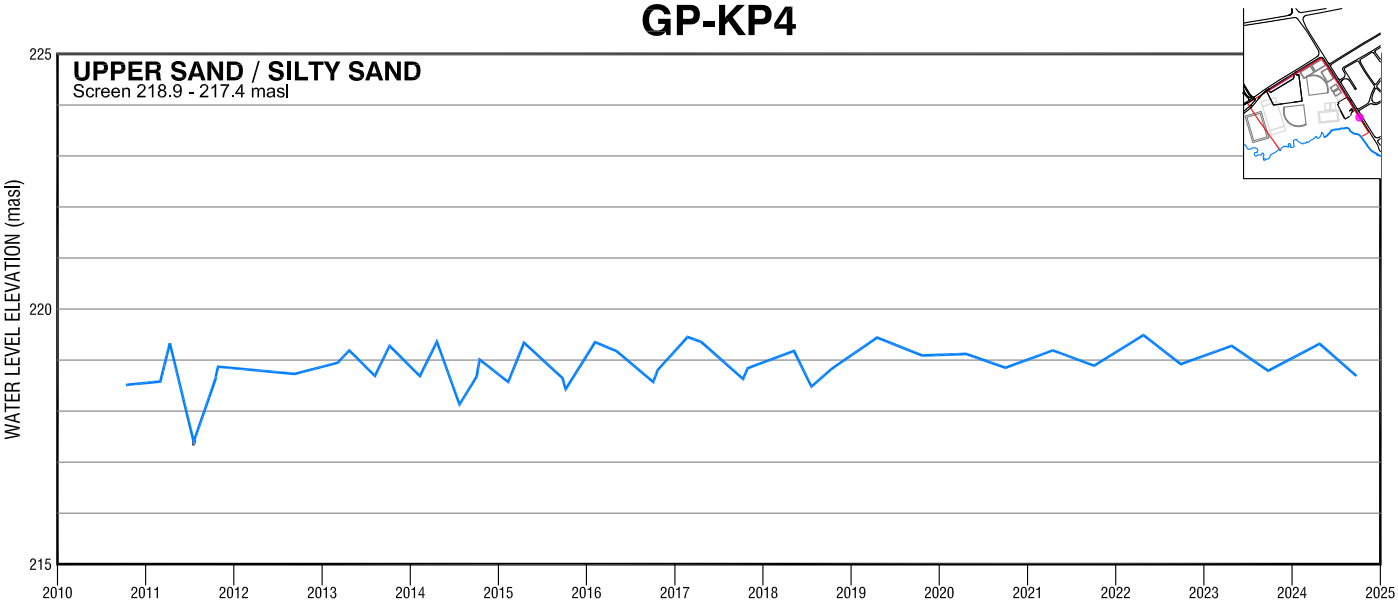
GP-KP3



MP Elevation 222.11 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
12-Oct-10	218.02	23-Apr-13	220.32	23-Sep-15	218.60	08-May-18	219.81	26-Apr-23	220.13		
19-Oct-10	218.44	08-Aug-13	218.91	07-Oct-15	218.50	21-Jul-18	218.56	25-Sep-23	218.69		
03-Mar-11	219.44	07-Oct-13	219.67	05-Feb-16	220.43	10-Oct-18	218.90	24-Apr-24	220.18		
11-Apr-11	220.35	10-Feb-14	219.50	03-May-16	219.70	23-Oct-19	218.97	23-Sep-24	217.71		
19-Jul-11	217.82	21-Apr-14	220.43	04-Oct-16	218.56	21-Apr-20	219.87				
18-Oct-11	219.54	24-Jul-14	219.12	21-Oct-16	218.87	02-Oct-20	218.83				
19-Oct-11	219.43	03-Oct-14	218.90	22-Feb-17	220.39	15-Apr-21	219.76				
28-Oct-11	219.58	14-Oct-14	218.78	25-Apr-17	220.06	04-Oct-21	218.92				
10-Sep-12	219.00	11-Feb-15	219.31	11-Oct-17	218.30	25-Apr-22	220.33				
07-Mar-13	219.68	17-Apr-15	220.21	29-Oct-17	218.34	28-Sep-22	218.47				

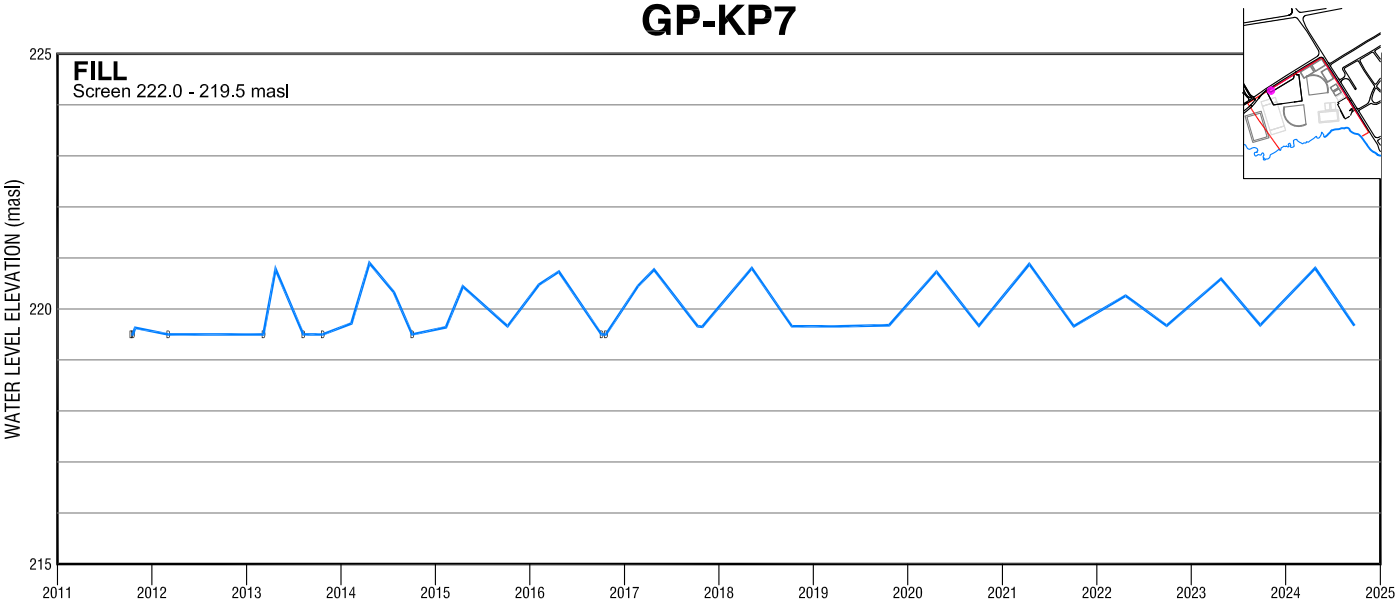
GP-KP4



MP Elevation 220.93 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
12-Oct-10	218.51	23-Apr-13	219.19	23-Sep-15	218.65	09-May-18	219.18	28-Sep-22	218.92		
19-Oct-10	218.52	08-Aug-13	218.69	07-Oct-15	218.43	21-Jul-18	218.48	26-Apr-23	219.28		
03-Mar-11	218.58	07-Oct-13	219.28	05-Feb-16	219.35	10-Oct-18	218.82	25-Sep-23	218.79		
11-Apr-11	219.33	10-Feb-14	218.69	03-May-16	219.18	18-Apr-19	219.44	24-Apr-24	219.32		
19-Jul-11	DRY	21-Apr-14	219.36	04-Oct-16	218.57	23-Oct-19	219.09	24-Sep-24	218.69		
18-Oct-11	218.64	24-Jul-14	218.13	21-Oct-16	218.80	21-Apr-20	219.12				
19-Oct-11	218.68	03-Oct-14	218.68	22-Feb-17	219.45	02-Oct-20	218.85				
28-Oct-11	218.87	15-Oct-14	219.01	19-Apr-17	219.36	15-Apr-21	219.19				
10-Sep-12	218.73	11-Feb-15	218.57	11-Oct-17	218.63	04-Oct-21	218.89				
07-Mar-13	218.95	17-Apr-15	219.34	29-Oct-17	218.84	25-Apr-22	219.49				

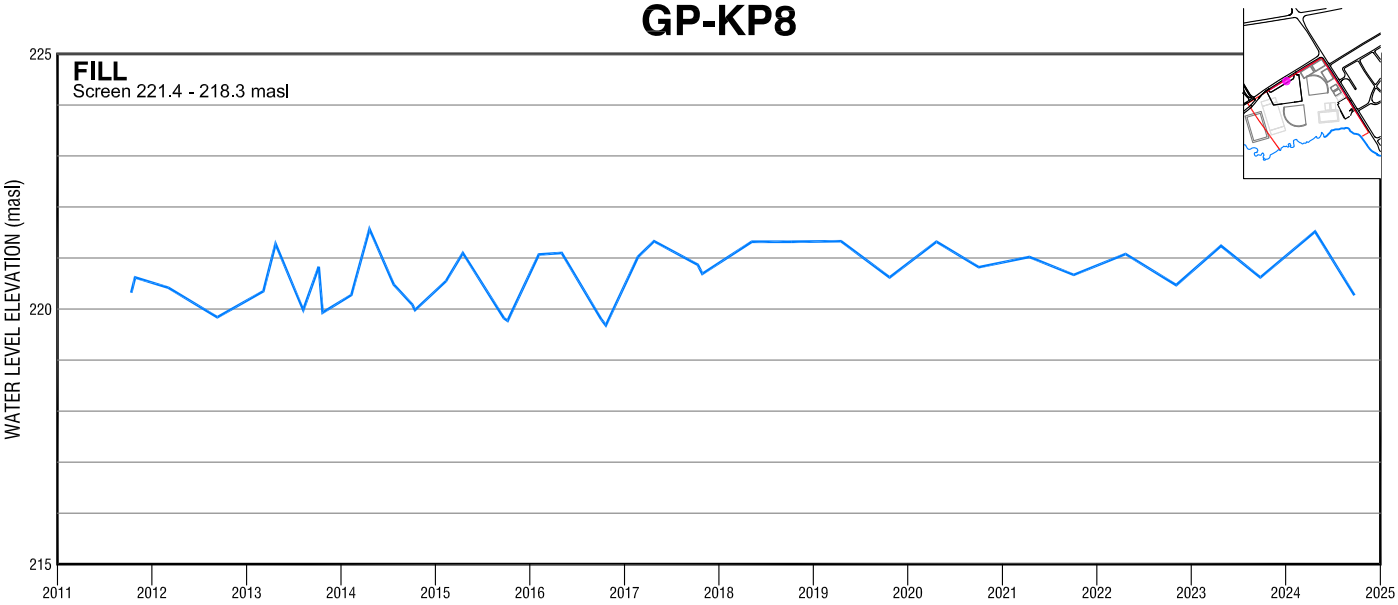
GP-KP7



MP Elevation 224.21 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
13-Oct-11	DRY	24-Jul-14	220.33	25-Apr-17	220.77	04-Oct-21	219.66				
19-Oct-11	DRY	03-Oct-14	DRY	11-Oct-17	219.66	22-Apr-22	220.26				
28-Oct-11	219.63	11-Feb-15	219.64	29-Oct-17	219.65	28-Sep-22	219.67				
04-Mar-12	DRY	17-Apr-15	220.44	08-May-18	220.80	26-Apr-23	220.59				
07-Mar-13	DRY	07-Oct-15	219.66	10-Oct-18	219.66	25-Sep-23	219.68				
23-Apr-13	220.78	05-Feb-16	220.48	18-Apr-19	219.66	24-Apr-24	220.80				
08-Aug-13	DRY	22-Apr-16	220.73	21-Oct-19	219.68	23-Sep-24	219.67				
22-Oct-13	DRY	04-Oct-16	DRY	21-Apr-20	220.73						
10-Feb-14	219.71	21-Oct-16	DRY	02-Oct-20	219.67						
21-Apr-14	220.90	22-Feb-17	220.45	15-Apr-21	220.88						

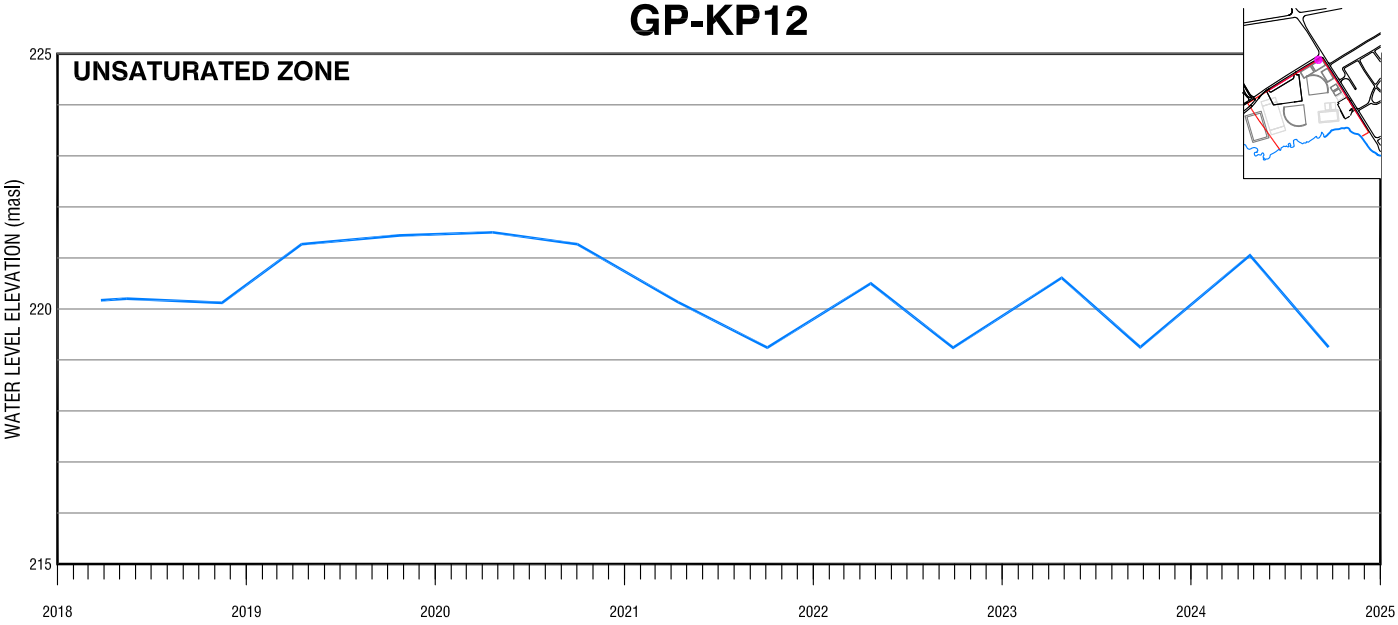
GP-KP8



MP Elevation 223.89 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
13-Oct-11	220.32	21-Apr-14	221.57	03-Oct-16	219.80	21-Apr-20	221.32				
28-Oct-11	220.62	24-Jul-14	220.48	21-Oct-16	219.68	02-Oct-20	220.82				
04-Mar-12	220.42	03-Oct-14	220.09	22-Feb-17	221.02	15-Apr-21	221.02				
10-Sep-12	219.84	14-Oct-14	219.98	25-Apr-17	221.33	04-Oct-21	220.67				
07-Mar-13	220.35	11-Feb-15	220.55	11-Oct-17	220.87	22-Apr-22	221.08				
23-Apr-13	221.28	17-Apr-15	221.10	29-Oct-17	220.69	04-Nov-22	220.47				
08-Aug-13	219.98	23-Sep-15	219.82	08-May-18	221.32	26-Apr-23	221.24				
07-Oct-13	220.83	07-Oct-15	219.77	10-Oct-18	221.32	25-Sep-23	220.62				
22-Oct-13	219.93	05-Feb-16	221.07	18-Apr-19	221.33	24-Apr-24	221.52				
10-Feb-14	220.28	03-May-16	221.10	23-Oct-19	220.62	23-Sep-24	220.27				

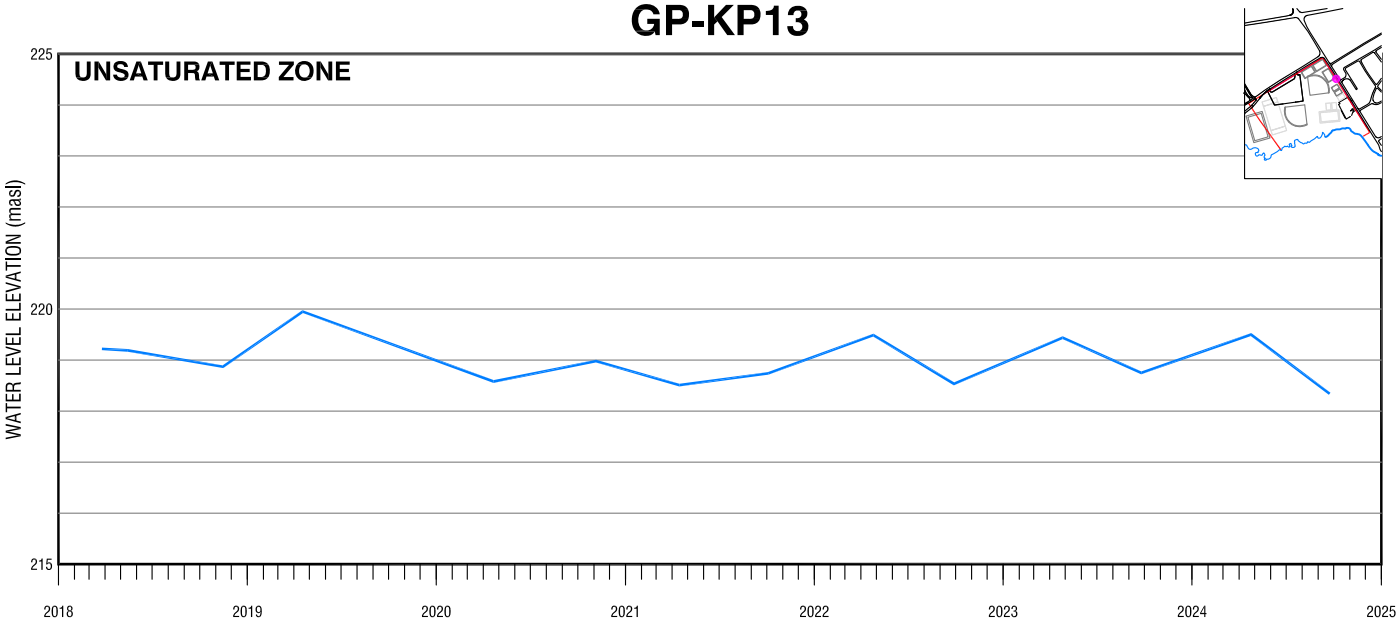
GP-KP12



MP Elevation 223.03 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
26-Mar-18	220.17	28-Sep-22	219.24								
15-May-18	220.20	26-Apr-23	220.61								
15-Nov-18	220.12	25-Sep-23	219.25								
18-Apr-19	221.27	24-Apr-24	221.05								
23-Oct-19	221.44	23-Sep-24	219.25								
21-Apr-20	221.50										
02-Oct-20	221.27										
15-Apr-21	220.13										
04-Oct-21	219.24										
22-Apr-22	220.50										

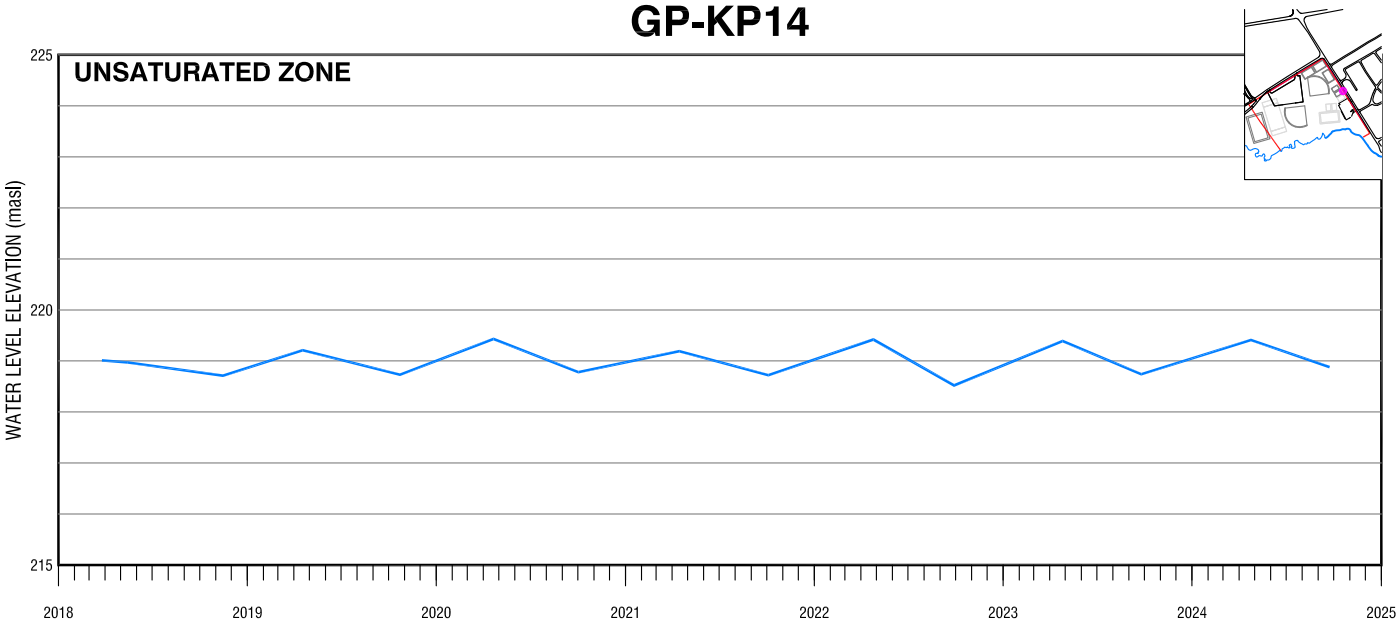
GP-KP13



MP Elevation 221.26 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
26-Mar-18	219.22	26-Apr-23	219.44								
15-May-18	219.19	25-Sep-23	218.75								
15-Nov-18	218.87	24-Apr-24	219.50								
18-Apr-19	219.95	23-Sep-24	218.34								
21-Apr-20	218.58										
05-Nov-20	218.98										
15-Apr-21	218.51										
04-Oct-21	218.74										
25-Apr-22	219.49										
28-Sep-22	218.54										

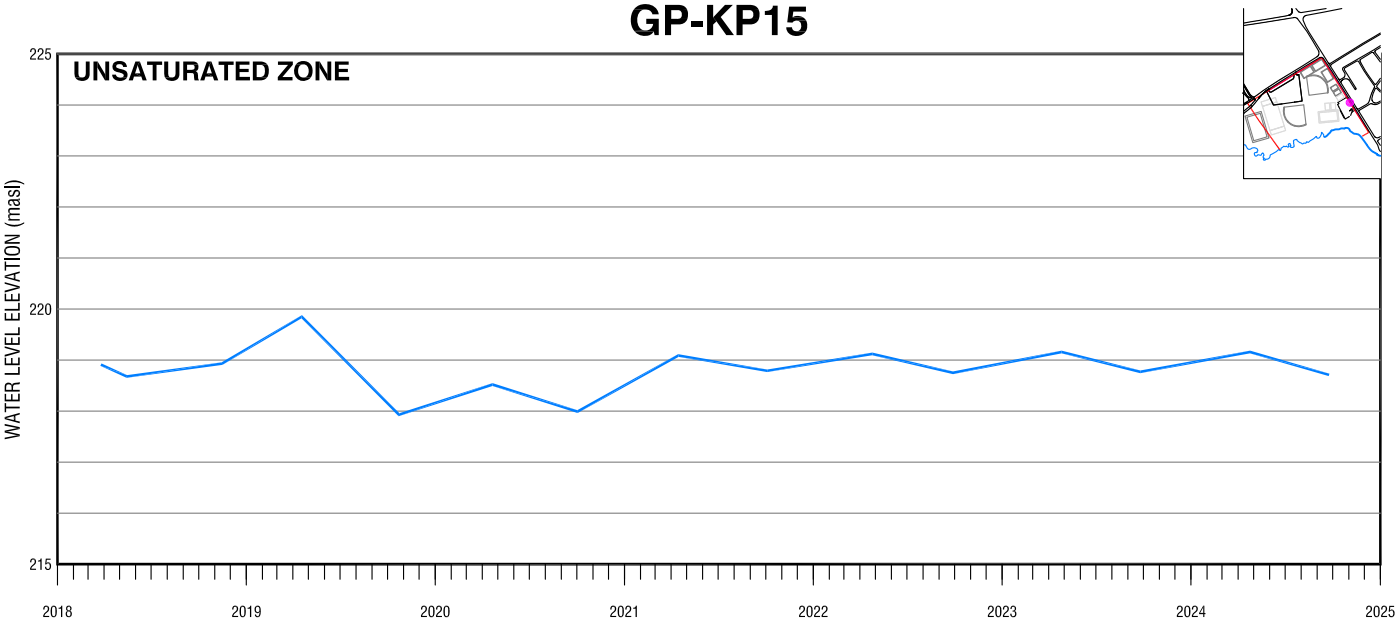
GP-KP14



MP Elevation 221.28 masl

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
26-Mar-18	219.01	28-Sep-22	218.52								
15-May-18	218.97	26-Apr-23	219.39								
15-Nov-18	218.71	25-Sep-23	218.74								
18-Apr-19	219.21	24-Apr-24	219.41								
23-Oct-19	218.73	23-Sep-24	218.88								
21-Apr-20	219.43										
02-Oct-20	218.78										
15-Apr-21	219.19										
04-Oct-21	218.72										
25-Apr-22	219.42										

GP-KP15



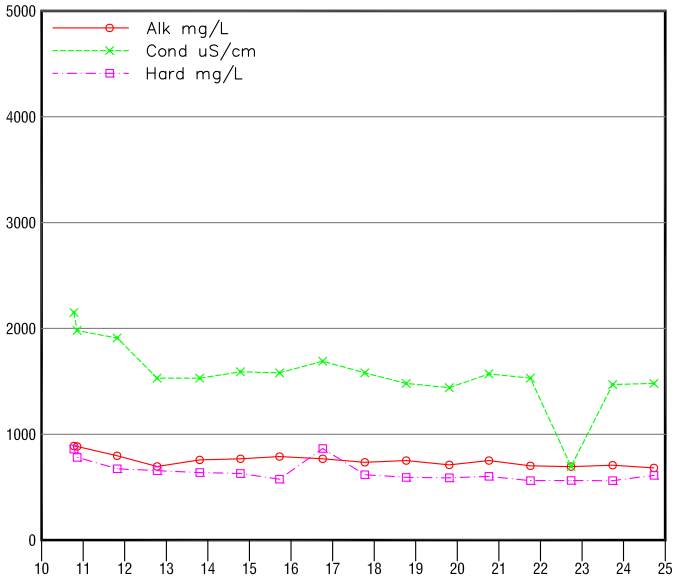
MP Elevation 220.57 masl

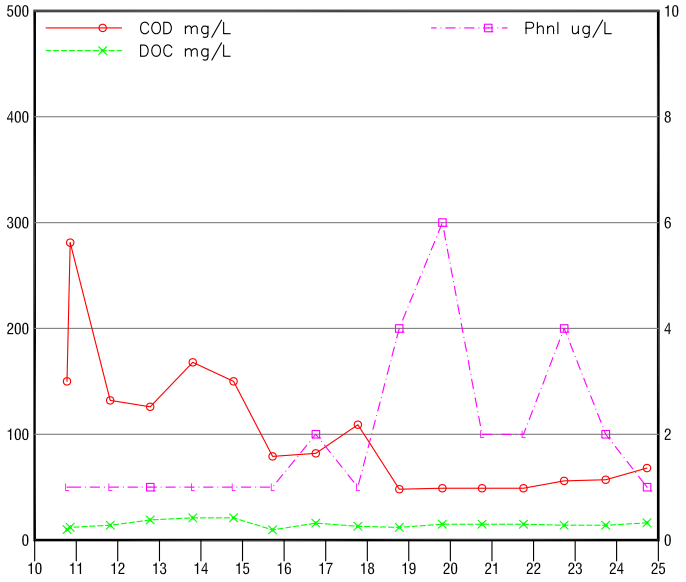
DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
26-Mar-18	218.91	28-Sep-22	218.75								
15-May-18	218.68	26-Apr-23	219.16								
15-Nov-18	218.93	25-Sep-23	218.77								
18-Apr-19	219.85	24-Apr-24	219.16								
23-Oct-19	217.93	24-Sep-24	218.71								
21-Apr-20	218.52										
02-Oct-20	217.99										
15-Apr-21	219.09										
04-Oct-21	218.79										
25-Apr-22	219.12										

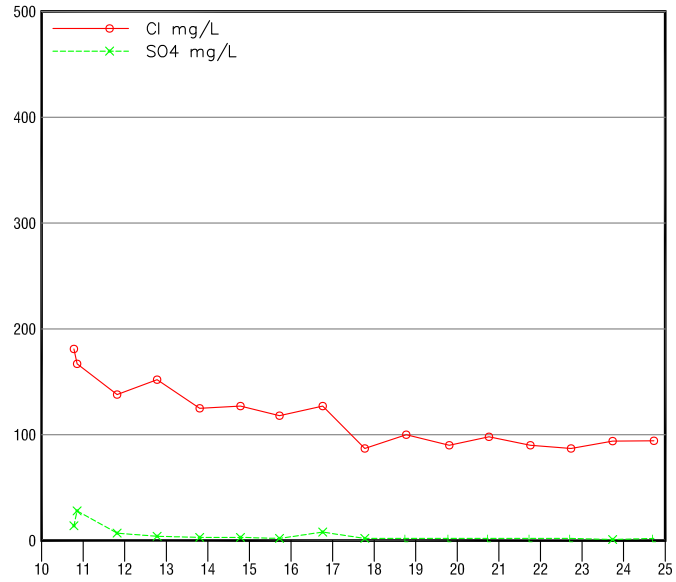
APPENDIX B

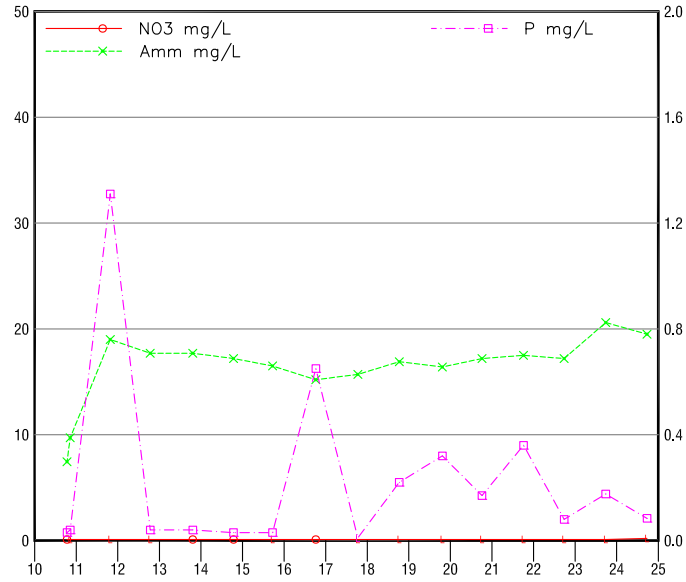
Water Quality Data

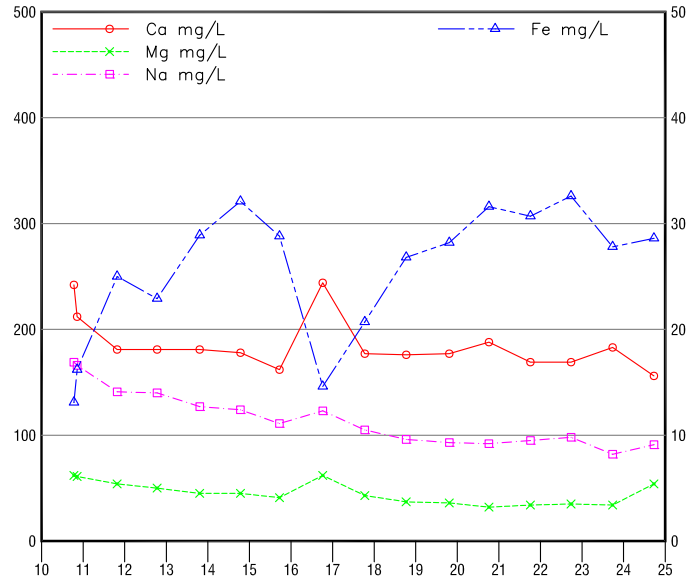
Water Quality Graphs and Data – Major Ions and Indicator Parameters











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW1-I

FORMERLY 1-IX
CONVERTED Sep 16

SAND AQUIFER

Screen 211.5 - 206.9 masl

22578520 27 Dec 24	WSP	24G001

OW1-I

SAND AQUIFER

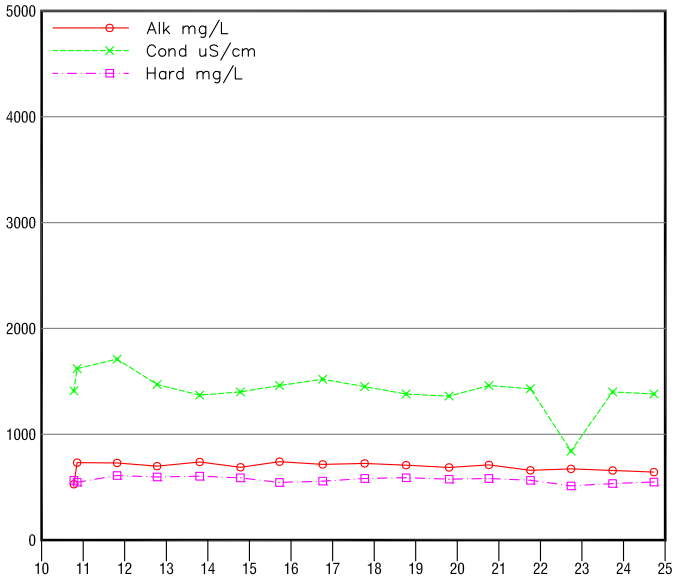
OBSERVATION WELL
Screen 211.5 - 206.9 masl

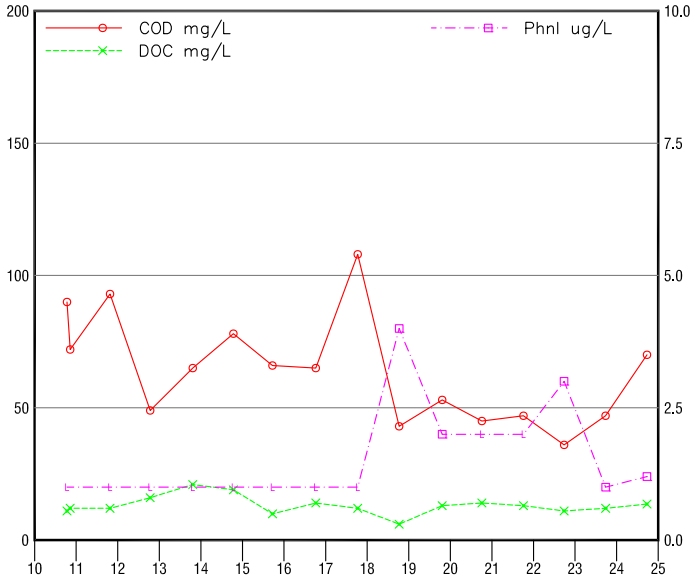
FORMERLY OW1-IX
CONVERTED Sep 16

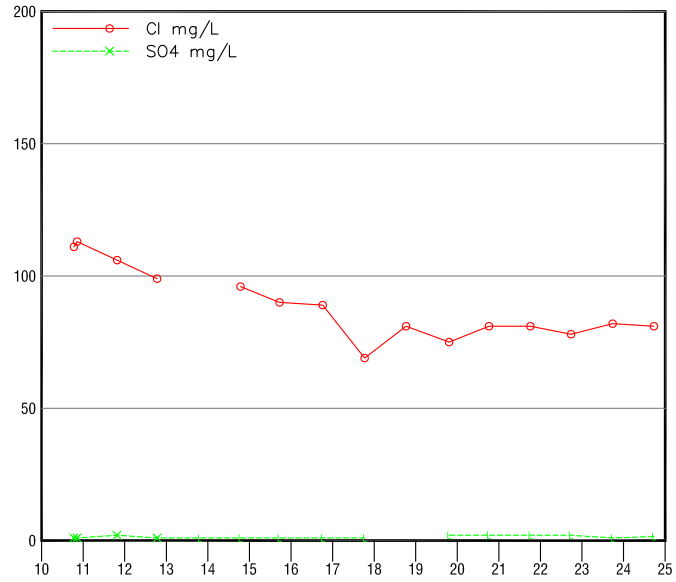
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	PhnI ug/L	Ion B %
	PWQO											0.3								1	
12-Oct-10	2114	889	2150	860	7.1	181	14	242	62	169	21	**13.1**	620	150	10	10.2	0.1	<0.1	7.45	<1	5.9
09-Nov-10	2179	885	1980	781	7.1	167	28	212	61	166	22	**16.2**	631	281	12	12.4	<0.1	<0.1	9.71		3.5
27-Oct-11	2356	796	1910	674	7.4	138	7	181	54	141	24	**25.0**	371	132	14	19.7	<0.1	<0.1	19.0	<1	6.0
12-Oct-12	2550	695	1530	656	7.7	152	4	181	50	140	24	**22.9**	237	126	19	20.0	<0.1	<0.1	17.7	1	9.1
21-Oct-13	2731	757	1530	638	7.3	125	3	181	45	127	22	**28.9**	211	168	21	20.0	0.1	<0.1	17.7	<1	6.0
14-Oct-14	2923	768	1590	629	7.2	127	3	178	45	124	22	**32.1**	229	150	21	19.0	0.1	<0.1	17.2	<1	4.8
22-Sep-15	3130	789	1580	575	7.3	118	2	162	41	111	19	**28.8**	174	79	9.6	18.3	<0.1	<0.1	16.5	<1	−0.4
06-Oct-16	3275	768	1690	865	7.5	127	8	244	62	123	21	**14.6**	906	82	16	17.2	0.1	<0.1	15.2	**2**	12.9
10-Oct-17	3453	735	1580	618	7.4	87	2	177	43	105	22	**20.7**	367	109	13	18.5	<0.1	<0.1	15.7	<1	6.0
09-Oct-18	3619	751	1480	592	7.4	100	<2	176	37	96	20	**26.8**	236	48	12	19.2	<0.1	<0.1	16.9	**4**	2.3
23-Oct-19	3807	711	1440	588	7.0	90	<2	177	36	93	20	**28.2**	185	49	15	17.5	<0.1	<0.1	16.4	**6**	5.1
05-Oct-20	4013	751	1570	602	7.6	98	<2	188	32	92	20	**31.6**	214	49	15	18.8	<0.1	<0.1	17.2	<2	3.0
05-Oct-21	4187	702	1530	562	7.3	90	<2	169	34	95	19	**30.7**	195	49	15	19.0	<0.1	<0.3	17.5	<2	2.8
27-Sep-22	4345	694	695	563	7.0	87	<2	169	35	98	19	**32.6**	200	56	14	19.7	<0.1	<0.1	17.2	**4**	6.0
27-Sep-23	4522	707	1470	561	7.0	94	1	183	34	82	21	**27.8**	174	57	14	13.9	<0.1	<0.1	20.6	**2**	5.3
24-Sep-24	4645	681	1480	611	6.59	94.3	<2	156	54	91	18	**28.6**	162	68	16.3	18	<0.2	<0.2	19.5	1	5.5

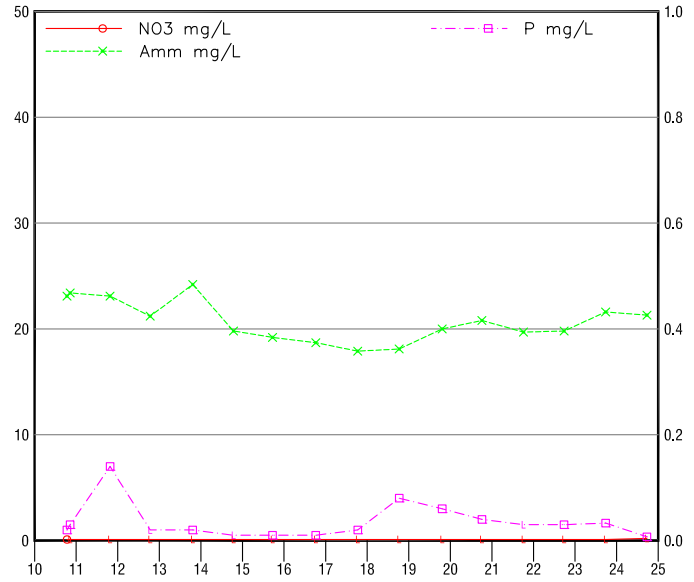
TOTAL SAMPLES	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	
AVERAGE 2024																				

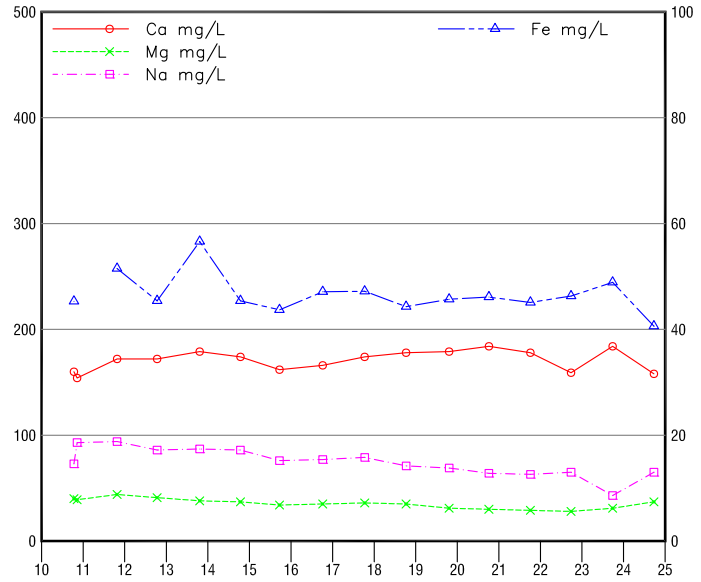
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW1-II

SAND AQUIFER

Screen 215.6 - 214.1 masl

22578520 27 Dec 24	WSP	24G002

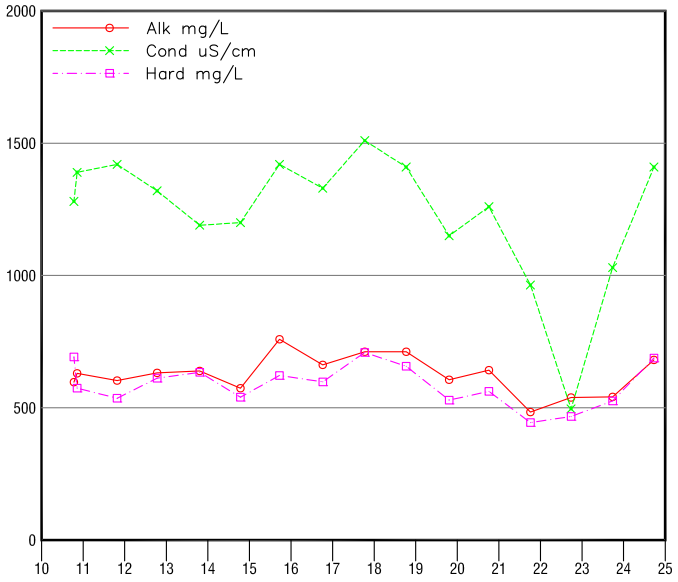
OW1-II

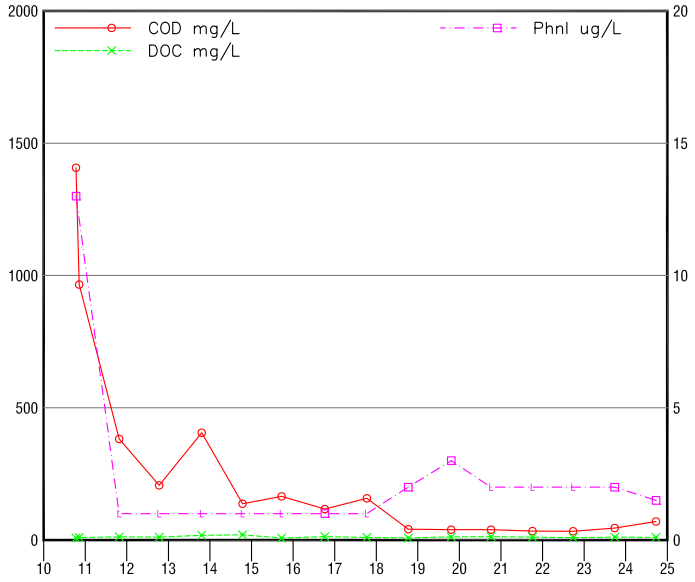
SAND AQUIFER

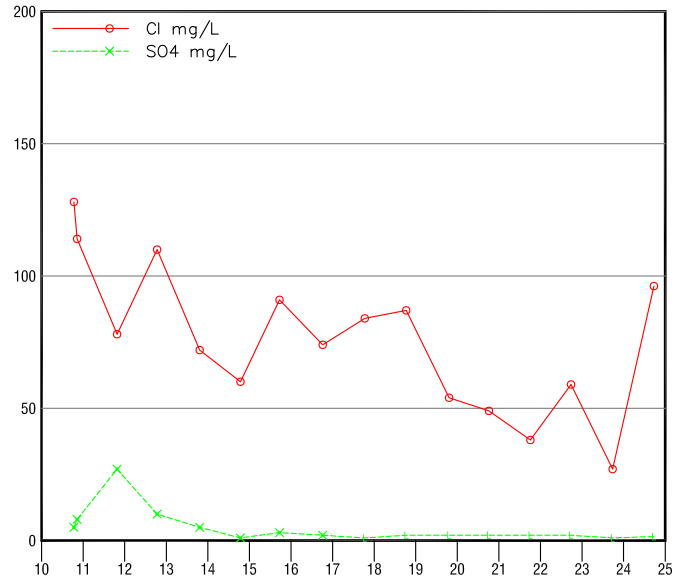
OBSERVATION WELL
Screen 215.6 - 214.1 masl

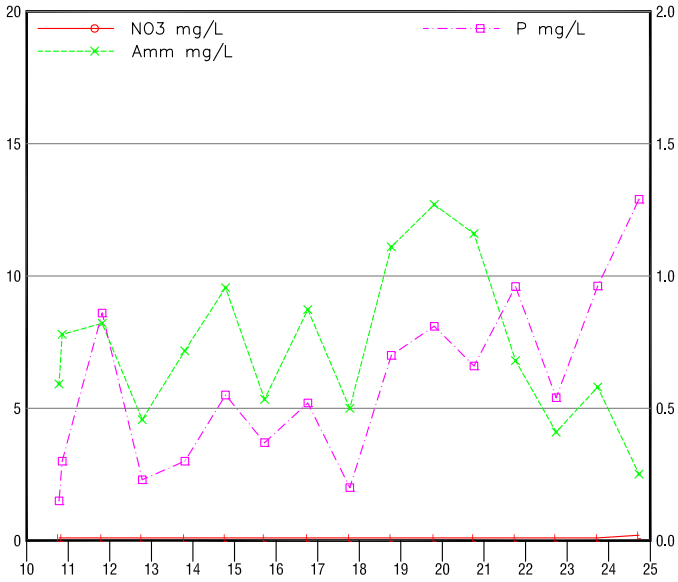
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
12-Oct-10	2115	528	1410	564	7.0	111	1	160	40	73	24	**45.3**	642	90	11	25.6	0.1	<0.1	23.1	<1	14.4
09-Nov-10	2180	732	1620	546	7.1	113	1	154	39	93	27	*0.05*	360	72	12	27.0	<0.1	<0.1	23.4		-1.5
26-Oct-11	2357	728	1710	610	7.2	106	2	172	44	94	26	**51.5**	393	93	12	25.1	<0.1	<0.1	23.1	<1	7.6
12-Oct-12	2551	698	1470	596	7.6	99	1	172	41	86	25	**45.4**	267	49	16	24.8	<0.1	<0.1	21.2	<1	7.5
21-Oct-13	2732	738	1370	603	7.2	*10*	<1	179	38	87	25	**56.6**	279	65	21	24.0	<0.1	<0.1	24.2	<1	14.8
14-Oct-14	2924	688	1400	588	7.2	96	<1	174	37	86	24	**45.4**	262	78	19	22.0	<0.1	<0.1	19.8	<1	7.5
22-Sep-15	3131	741	1460	544	7.2	90	<1	162	34	76	21	**43.7**	258	66	9.9	20.4	<0.1	<0.1	19.2	<1	0.9
06-Oct-16	3276	715	1520	557	7.4	89	<1	166	35	77	22	**47.1**	275	65	14	20.9	<0.1	<0.1	18.7	<1	3.7
10-Oct-17	3504	724	1450	582	7.5	69	<1	174	36	79	23	**47.2**	236	108	12	21.3	<0.1	<0.1	17.9	<1	6.3
09-Oct-18	3620	707	1380	589	7.2	81	*96*	178	35	71	21	**44.3**	254	43	6.0	20.8	<0.1	<0.1	18.1	**4**	-0.4
22-Oct-19	3808	687	1360	575	7.0	75	<2	179	31	69	21	**45.7**	252	53	13	18.5	<0.1	<0.1	20	**2**	6.6
05-Oct-20	4014	711	1460	582	7.5	81	<2	184	30	64	21	**46.1**	262	45	14	21.9	<0.1	<0.1	20.8	<2	4.6
05-Oct-21	4188	659	1430	565	7.2	81	<2	178	29	63	22	**45.1**	261	47	13	22.9	<0.1	<0.1	19.7	<2	4.8
27-Sep-22	4346	673	841	512	6.8	78	<2	159	28	65	19	**46.3**	248	36	11	22.5	<0.1	<0.1	19.8	**3**	2.9
27-Sep-23	4523	658	1400	534	7.1	82	<1	184	31	43	22	**48.9**	266	47	12	15.1	<0.1	<0.1	21.6	1	5.1
24-Sep-24	4646	642	1380	548	6.67	81	<1.5	158	37	65	19	**40.6**	249	70	13.6	18.1	<0.2	<0.2	21.3	**1.2**	3.8
TOTAL SAMPLES		16	16	16	16	15	15	16	16	16	16	15	16	16	16	16	16	16	16	15	
AVERAGE 2024																					

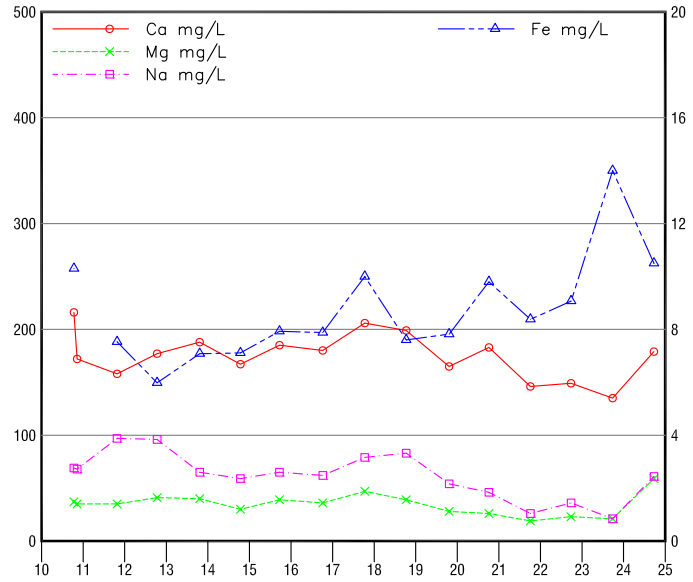
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L Concentration Reported Less Than

G Concentration Reported Greater Than

A Concentration Determined Anomalous

Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW1-III

PEAT

Screen 219.3 - 218.1 masl

22578520

27 Dec 24

24G003

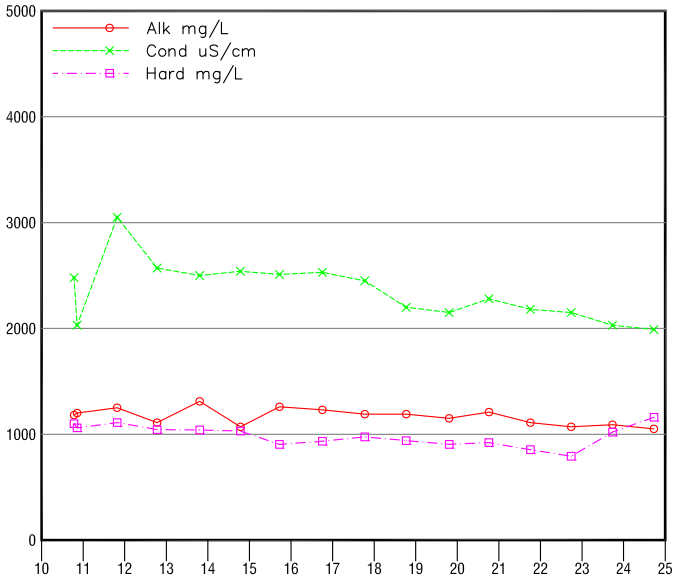
OW1-III

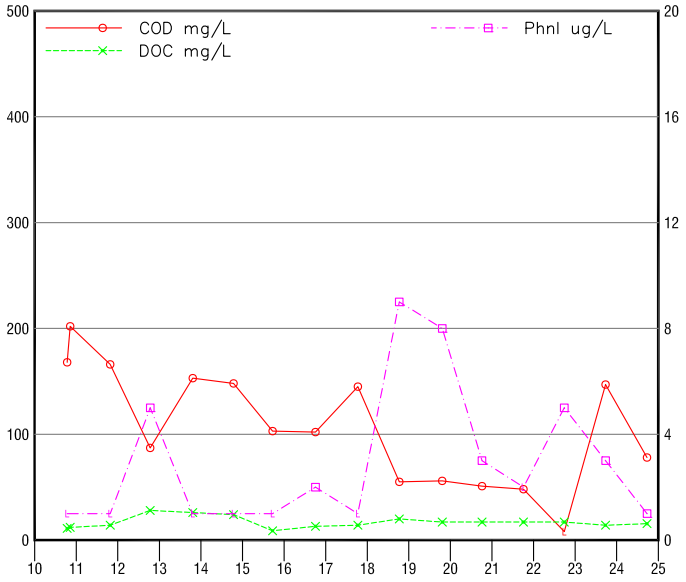
PEAT

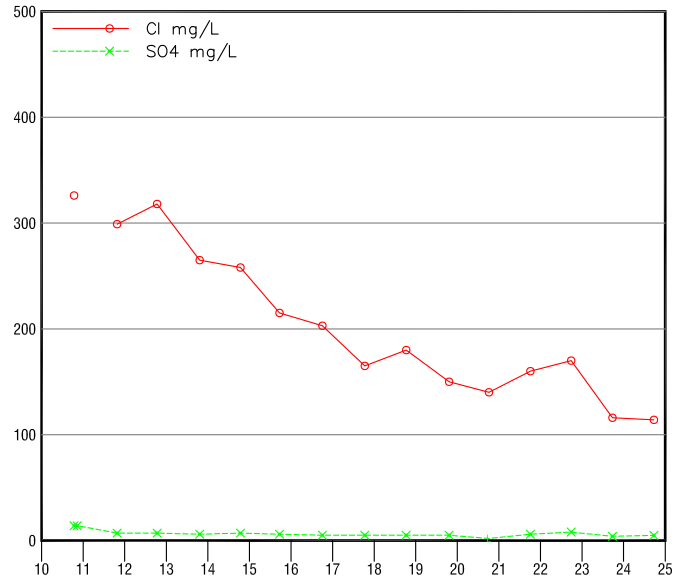
OBSERVATION WELL
Screen 219.3 - 218.1 masl

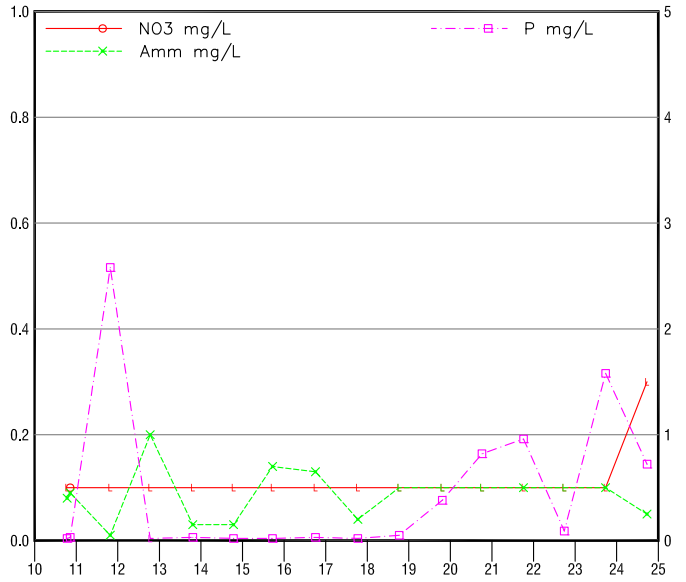
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
12-Oct-10	2116	597	1280	692	7.0	128	5	216	37	69	7.0	**10.3**	1590	1407	7.8	7.6	<0.1	<0.1	5.92	**13**	6.4
09-Nov-10	2181	630	1390	574	7.1	114	8	172	35	68	7.3	*0.03*	761	966	9.7	10.7	<0.1	<0.1	7.79		−2.6
26-Oct-11	2358	603	1420	536	7.4	78	27	158	35	97	7.6	**7.53**	1180	382	12	17.6	<0.1	<0.1	8.21	<1	4.0
12-Oct-12	2552	632	1320	612	8.0	110	10	177	41	96	5.8	**5.98**	1170	207	11	6.0	<0.1	<0.1	4.57	<1	3.4
21-Oct-13	2733	639	1190	634	7.3	72	5	188	40	65	6.9	**7.08**	1330	406	18	8.5	<0.1	<0.1	7.17	<1	4.9
14-Oct-14	2925	574	1200	540	7.3	60	1	167	30	59	11	**7.11**	1000	137	20	13.0	<0.1	<0.1	9.56	<1	5.1
22-Sep-15	3132	759	1420	622	7.4	91	3	185	39	65	6.5	**7.93**	1330	165	7.5	7.9	<0.1	<0.1	5.34	<1	−5.0
06-Oct-16	3277	662	1330	598	7.7	74	2	180	36	62	8.3	**7.88**	1070	117	13	11.0	<0.1	<0.1	8.73	1	1.3
10-Oct-17	3454	712	1510	709	7.5	84	<1	206	47	79	7.4	**10.0**	1510	158	9.9	7.3	<0.1	<0.1	5.0	<1	5.4
09-Oct-18	3621	712	1410	657	7.3	87	<2	199	39	83	12	**7.60**	1210	41	8.0	13.0	<0.1	<0.1	11.1	**2**	4.1
22-Oct-19	3809	606	1150	529	7.3	54	<2	165	28	54	12	**7.82**	936	39	12	12.7	<0.1	<0.1	12.7	**3**	2.7
05-Oct-20	4015	642	1260	562	7.6	49	<2	183	26	46	12	**9.80**	911	39	13	12.9	<0.1	<0.1	11.6	<2	1.8
05-Oct-21	4189	484	964	444	7.5	38	<2	146	19	26	8.7	**8.38**	754	34	11	7.3	<0.1	<0.1	6.8	<2	0.1
27-Sep-22	4347	539	496	467	7.1	59	<2	149	23	36	6.0	**9.07**	951	33	9.0	5.2	<0.1	<0.1	4.1	<2	−3.3
27-Sep-23	4524	541	1030	526	7.4	27	<1	135	21	21	8.6	**14.0**	812	45	11	6.1	<0.1	<0.1	5.8	**2**	7.8
24-Sep-24	4647	681	1410	688	6.72	96.2	<1.5	179	59	61	5.8	**10.5**	1300	70	10.1	2.6	<0.2	<0.2	2.51	**1.5**	4.8
TOTAL SAMPLES		16	16	16	16	16	16	16	16	16	16	15	16	16	16	16	16	16	16	15	
AVERAGE 2024																					

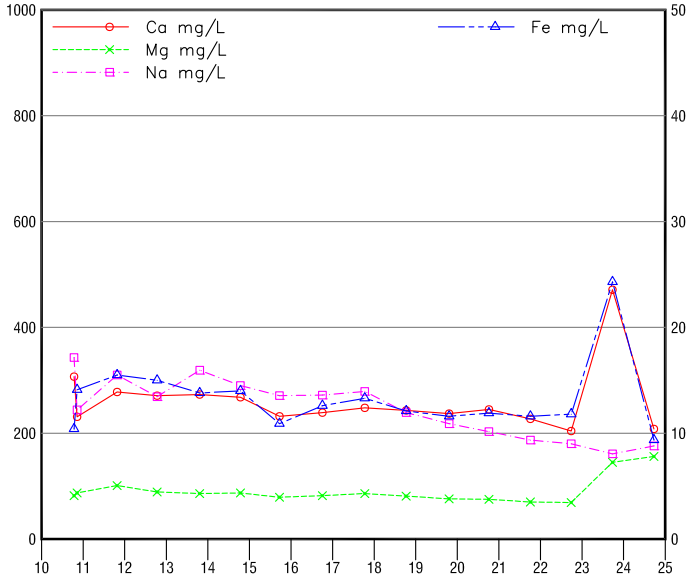
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW2-I

SAND AQUIFER

Screen 212.6 - 210.1 masl

22578520 27 Dec 24	wsp	24G004

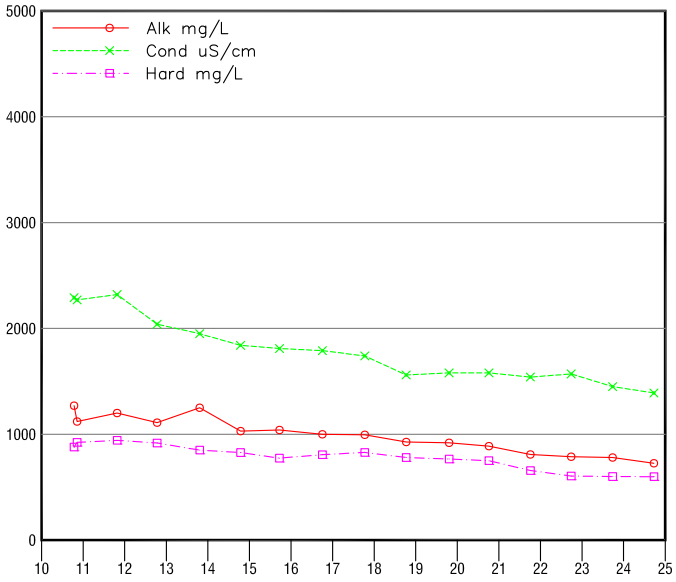
OW2-I

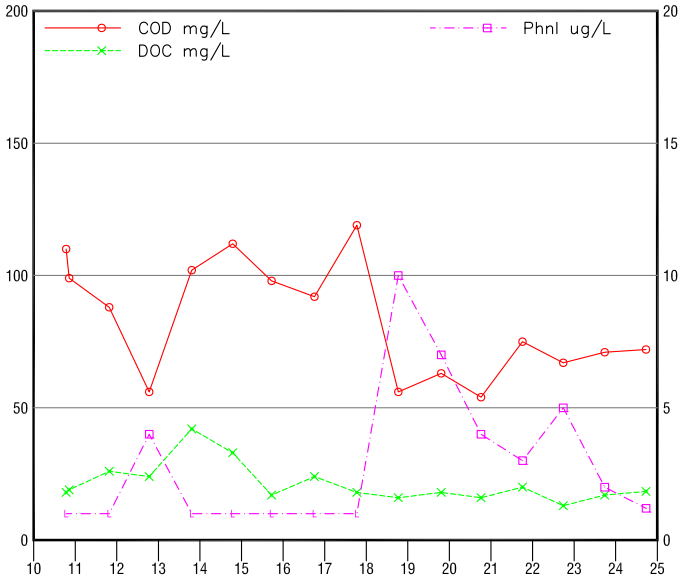
SAND AQUIFER

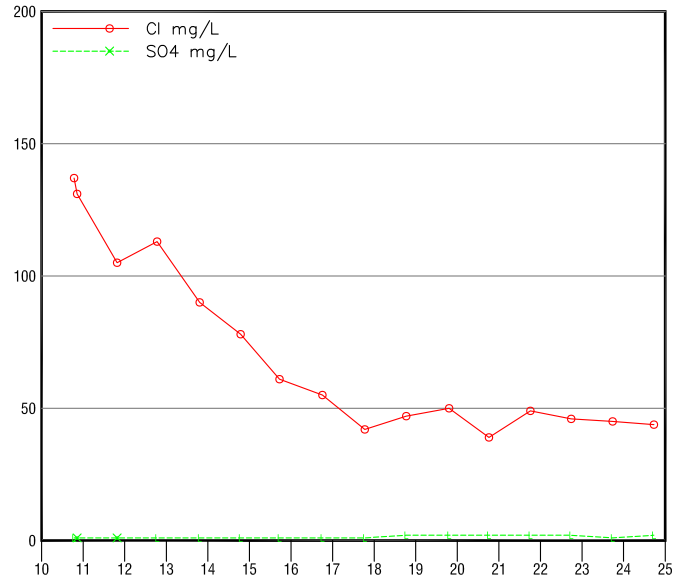
OBSERVATION WELL
Screen 212.6 - 210.1 masl

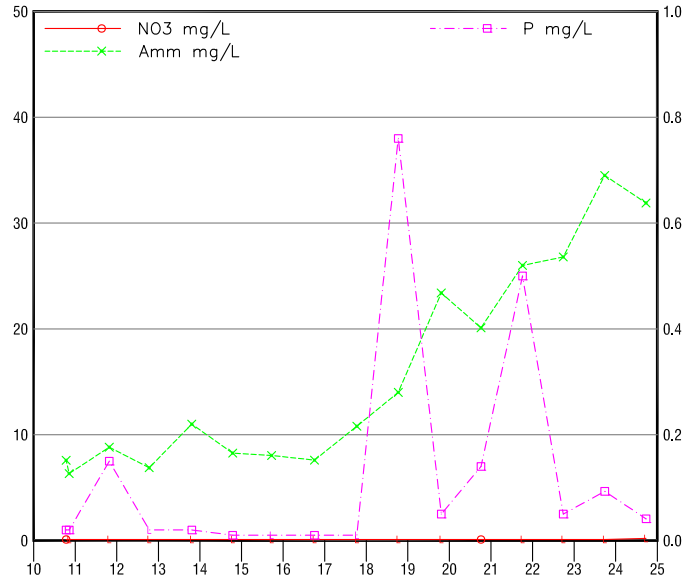
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
13-Oct-10	2117	1180	2480	1100	7.0	326	14	307	82	343	7.8	**10.4**	292	168	11	1.7	<0.1	<0.1	0.08	<1	6.4
09-Nov-10	2182	1200	2030	1060	7.1	*3*	14	231	87	244	7.6	**14.1**	274	202	12	1.5	0.1	<0.1	0.09		10.4
27-Oct-11	2359	1250	3050	1110	7.3	299	7	278	101	310	6.7	**15.5**	110	166	14	1.7	<0.1	<0.1	0.01	<1	4.1
12-Oct-12	2565	1110	2570	1044	7.6	318	7	271	89	269	6.8	**15.0**	139	87	28	1.5	<0.1	<0.1	0.20	**5**	3.1
21-Oct-13	2734	1310	2500	1040	7.2	265	6	273	86	319	6.4	**13.8**	94	153	26	2.2	<0.1	<0.1	0.03	<1	2.1
14-Oct-14	2926	1070	2540	1030	7.2	258	7	268	87	290	6.5	**14.0**	122	148	24	1.8	<0.1	<0.1	0.03	<1	8.0
22-Sep-15	3133	1260	2510	904	7.4	215	6	232	79	271	5.2	**10.9**	98	103	8.8	1.4	<0.1	<0.1	0.14	<1	-1.6
03-Oct-16	3278	1230	2530	934	7.5	203	5	239	82	272	5.5	**12.6**	102	102	13	2.0	<0.1	<0.1	0.13	**2**	1.1
10-Oct-17	3455	1190	2450	975	7.5	165	5	248	86	279	5.9	**13.3**	108	145	14	1.2	<0.1	<0.1	0.04	<1	6.1
09-Oct-18	3622	1190	2200	940	7.2	180	5	243	81	239	5.5	**12.1**	105	55	20	0.6	<0.1	<0.3	<0.1	**9**	1.5
22-Oct-19	3810	1150	2150	904	7.2	150	5	237	76	218	5.1	**11.6**	98	56	17	0.7	<0.1	<0.1	<0.1	**8**	1.6
05-Oct-20	4016	1210	2280	921	7.7	140	<2	245	75	203	5.4	**11.9**	114	51	17	<0.5	<0.1	<0.1	<0.1	**3**	-0.4
05-Oct-21	4190	1110	2180	854	7.4	160	6	227	70	187	4.9	**11.6**	118	48	17	0.7	<0.1	<0.3	0.1	<2	-1.6
28-Sep-22	4348	1070	2150	792	7.7	170	8	204	69	180	4.4	**11.8**	135	<8	17	1.2	<0.1	<0.1	<0.1	**5**	-4.0
26-Sep-23	4525	1090	2030	1020	7.3	116	4	471	145	161	4.6	**24.3**	1390	147	14	0.6	<0.1	<0.1	0.1	**3**	10.5
24-Sep-24	4648	1050	1990	1160	6.82	114	4.9	208	156	176	5.3	**9.36**	115	78	15.5	<0.2	<0.3	<0.3	0.05	1	9.3
TOTAL SAMPLES		16	16	16	16	15	16	16	16	16	16	16	16	16	16	16	16	16	16	15	
AVERAGE 2024																					

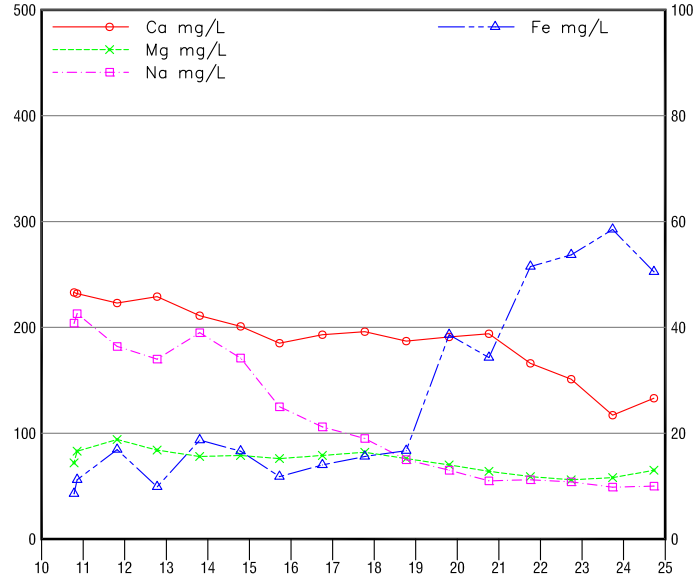
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L Concentration Reported Less Than

G Concentration Reported Greater Than

A Concentration Determined Anomalous

Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW2-II

SAND AQUIFER

Screen 217.8 - 213.2 masl

22578520

27 Dec 24

24G005

OW2-II

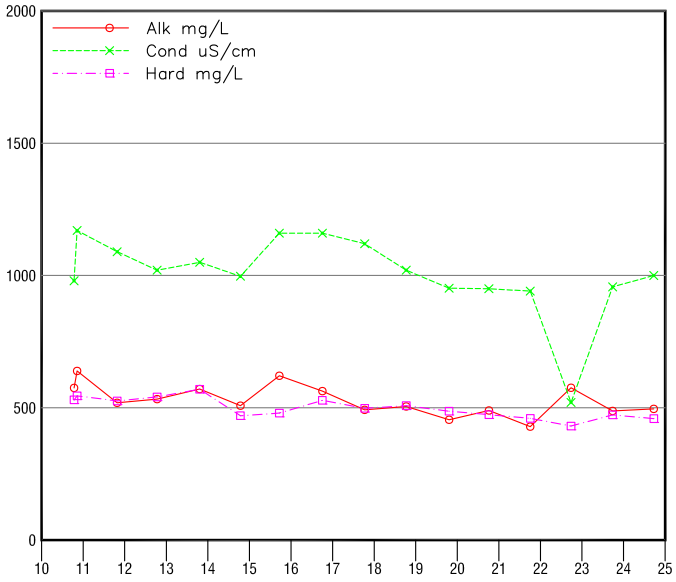
SAND AQUIFER

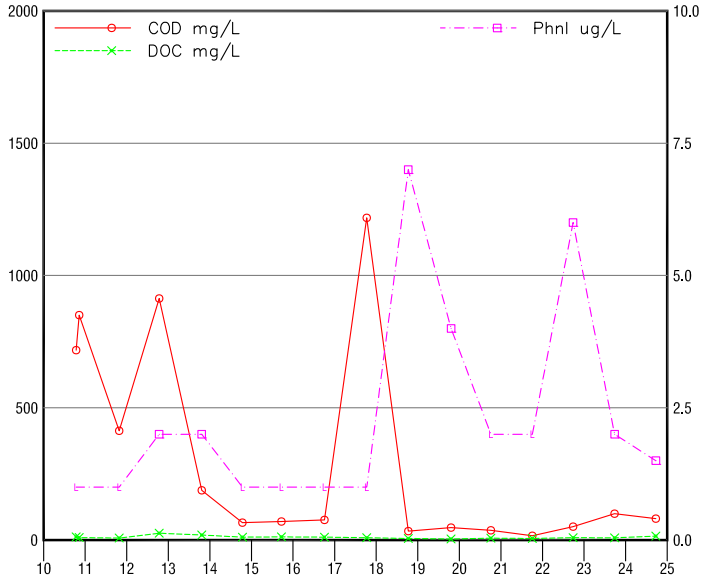
OBSERVATION WELL
Screen 217.8 - 213.2 masl

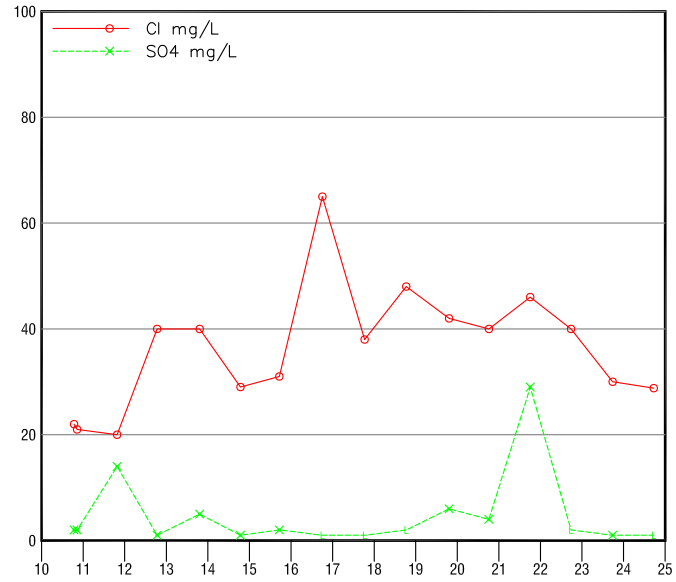
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	PhnI ug/L	Ion B %
	PWQO											0.3								1	
13-Oct-10	2118	1270	2290	879	6.9	137	<1	233	72	204	15	**8.57**	1280	110	18	10.0	0.1	<0.1	7.58	<1	-2.8
09-Nov-10	2183	1120	2270	923	7.1	131	1	232	83	213	17	**11.2**	1450	99	19	9.9	<0.1	<0.1	6.33		5.2
27-Oct-11	2360	1200	2320	942	7.3	105	1	223	94	182	17	**16.9**	1540	88	26	10.7	<0.1	<0.1	8.82	<1	2.7
12-Oct-12	2553	1110	2040	917	7.5	113	<1	229	84	170	18	**9.86**	1460	56	24	9.8	<0.1	<0.1	6.88	**4**	3.2
21-Oct-13	2735	1250	1950	850	7.2	90	<1	211	78	195	17	**18.7**	1100	102	42	13.0	<0.1	<0.1	11.0	<1	-0.4
15-Oct-14	2927	1030	1840	827	7.2	78	<1	201	79	171	16	**16.6**	1000	112	33	9.7	<0.1	<0.1	8.26	<1	5.8
22-Sep-15	3134	1040	1810	774	7.4	61	<1	185	76	125	14	**11.8**	875	98	17	10.2	<0.1	<0.1	8.04	<1	-0.5
03-Oct-16	3279	1000	1790	807	7.5	55	<1	193	79	106	14	**14.0**	910	92	24	9.2	<0.1	<0.1	7.6	<1	1.4
10-Oct-17	3456	994	1740	828	7.5	42	<1	196	82	95	17	**15.6**	893	119	18	12.9	<0.1	<0.1	10.8	<1	3.2
09-Oct-18	3623	927	1560	780	7.3	47	<2	187	76	75	17	**16.7**	850	56	16	16.3	<0.1	<0.1	14	**10**	2.5
22-Oct-19	3811	919	1580	766	7.0	50	<2	191	70	65	22	**38.6**	787	63	18	23.5	<0.1	<0.1	23.4	**7**	4.7
05-Oct-20	4017	888	1580	750	7.7	39	<2	194	64	55	19	**34.3**	892	54	16	19.6	0.1	<0.1	20.1	**4**	4.2
05-Oct-21	4191	809	1540	657	7.3	49	<2	166	59	56	21	**51.5**	697	75	20	29.6	<0.1	<0.3	26.0	**3**	3.8
28-Sep-22	4349	787	1570	605	7.7	46	<2	151	56	54	20	**53.7**	595	67	13	29.9	<0.1	<0.1	26.8	**5**	5.0
27-Sep-23	4526	780	1450	600	6.9	45	<1	117	58	49	26	**58.5**	542	71	17	24.2	<0.1	<0.1	34.5	**2**	5.1
24-Sep-24	4649	725	1390	599	6.71	43.8	<2	133	65	50	21	**50.5**	376	72	18.4	51	<0.2	<0.2	31.9	**1.2**	3.0

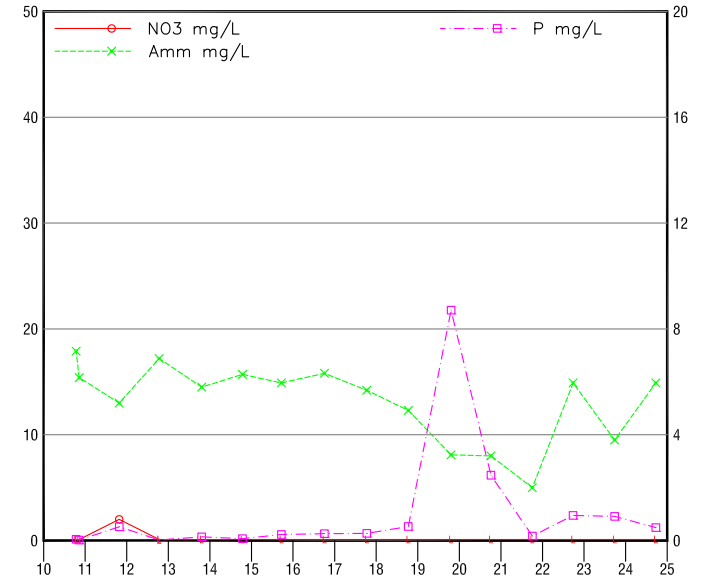
TOTAL SAMPLES	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	
AVERAGE 2024																					

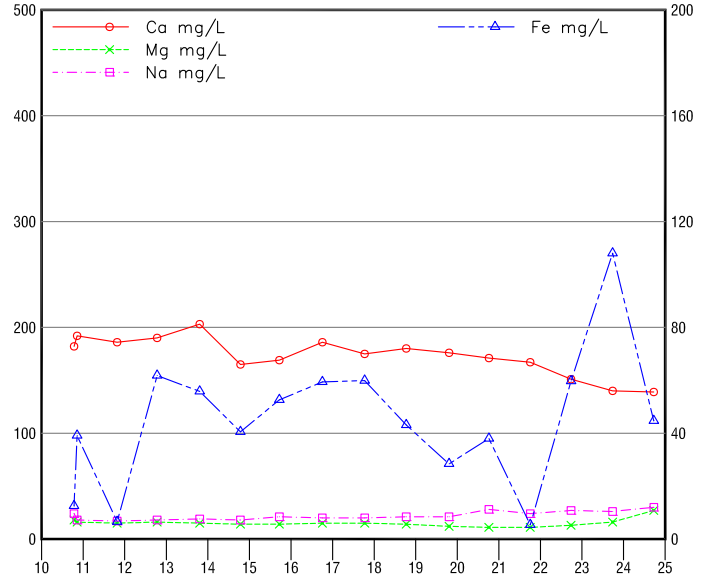
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW3

WASTE

Screen 221.5 - 218.7 masl

22578520 27 Dec 24	WSP	24G006

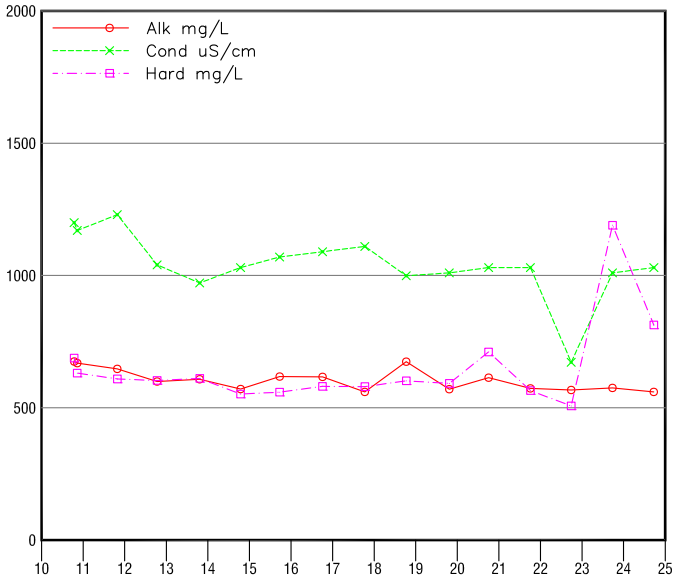
OW3

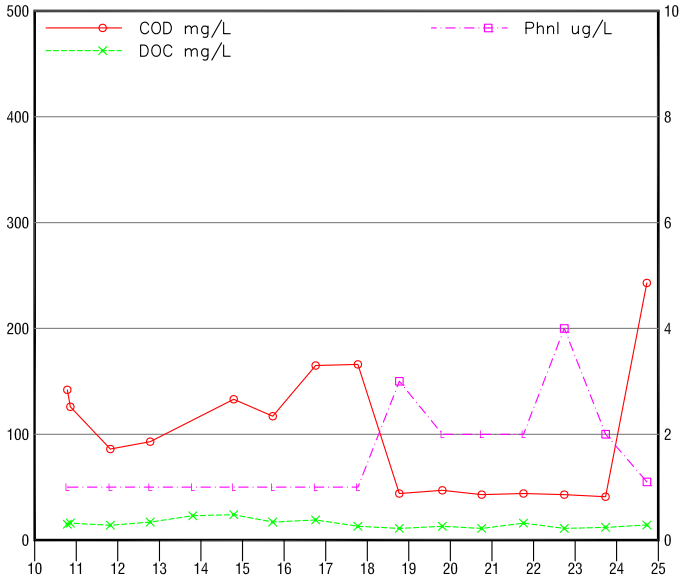
WASTE

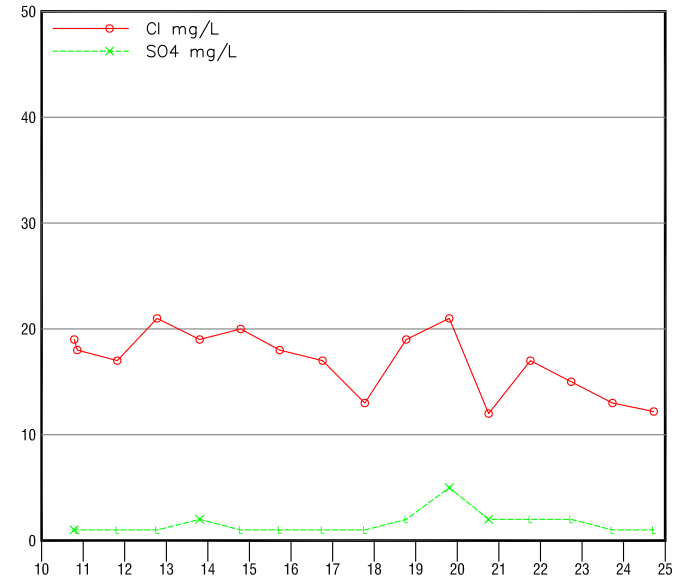
OBSERVATION WELL
Screen 221.5 - 218.7 masl

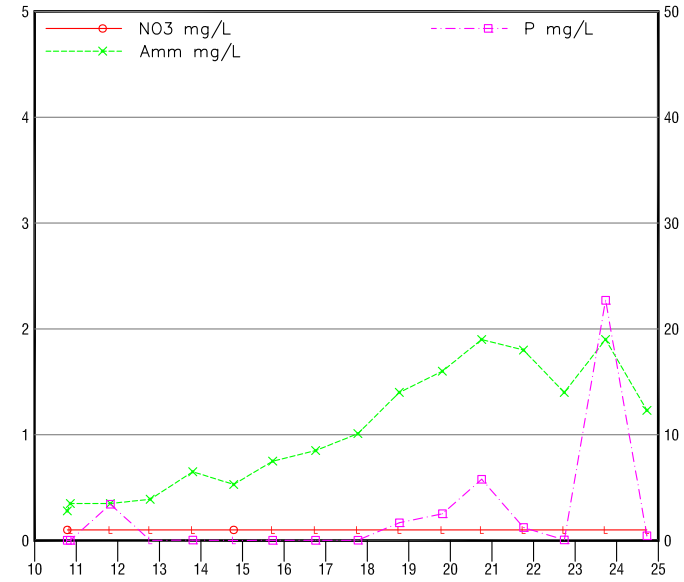
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
13-Oct-10	2119	575	980	530	6.9	22	2	182	18	24	14	**12.5**	2700	718	12	20.4	<0.1	<0.1	17.9	<1	6.0
09-Nov-10	2184	639	1170	545	7.0	21	2	192	16	18	10	**39.1**	1670	850	9.4	18.7	<0.1	<0.1	15.4		3.7
27-Oct-11	2361	519	1090	526	7.3	20	14	186	15	17	7.8	**6.53**	2600	413	7.6	14.7	2.0	<0.1	13.0	<1	5.2
12-Oct-12	2554	533	1020	541	7.8	40	1	190	16	18	11	**61.8**	1070	913	26	20.6	<0.1	<0.1	17.2	**2**	12.9
21-Oct-13	2736	571	1050	570	7.0	40	5	203	15	19	9.0	**55.8**	1520	188	19	16.0	<0.1	<0.1	14.5	**2**	10.0
14-Oct-14	2928	508	997	470	7.1	29	1	165	14	18	9.4	**40.5**	1070	66	11	16.0	<0.1	<0.1	15.7	<1	8.3
21-Sep-15	3135	621	1160	480	7.0	31	2	169	14	21	9.0	**52.6**	941	70	12	16.7	<0.1	<0.1	14.9	<1	1.3
03-Oct-16	3280	563	1160	528	7.3	65	<1	186	15	20	9.9	**59.4**	1010	76	11	17.7	<0.1	<0.1	15.8	<1	6.5
10-Oct-17	3457	492	1120	498	7.3	38	<1	175	15	20	9.7	**59.9**	897	1218	8.8	15.1	<0.1	<0.1	14.2	<1	13.3
10-Oct-18	3624	505	1020	508	7.2	48	<2	180	14	21	9.1	**43.1**	946	34	6.0	15.1	<0.1	<0.1	12.3	**7**	9.0
21-Oct-19	3812	455	952	487	7.2	42	6	176	12	21	7.8	**28.4**	840	47	4.0	9.1	<0.1	<0.1	8.1	**4**	9.1
05-Oct-20	4018	490	950	474	7.6	40	4	171	11	28	8.9	**38.0**	992	37	7.0	8.6	<0.1	<0.1	8.0	<2	7.7
04-Oct-21	4192	429	941	460	7.4	46	29	167	11	24	8.4	**5.37**	836	16	6.0	5.6	<0.1	<0.1	5.0	<2	1.6
27-Sep-22	4350	576	520	431	6.9	40	<2	151	13	27	9.0	**59.7**	574	51	9.0	17.1	<0.1	<0.1	14.9	**6**	2.1
27-Sep-23	4527	488	957	473	7.2	30	1	140	16	26	11	**108**	713	100	8.3	13.0	<0.1	<0.1	9.5	**2**	7.0
23-Sep-24	4650	496	1000	459	6.86	28.8	<1	139	27	30	11	**44.7**	385	81	14.9	13	<0.1	<0.1	14.9	**1.5**	4.0
TOTAL SAMPLES		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	
AVERAGE 2024																					

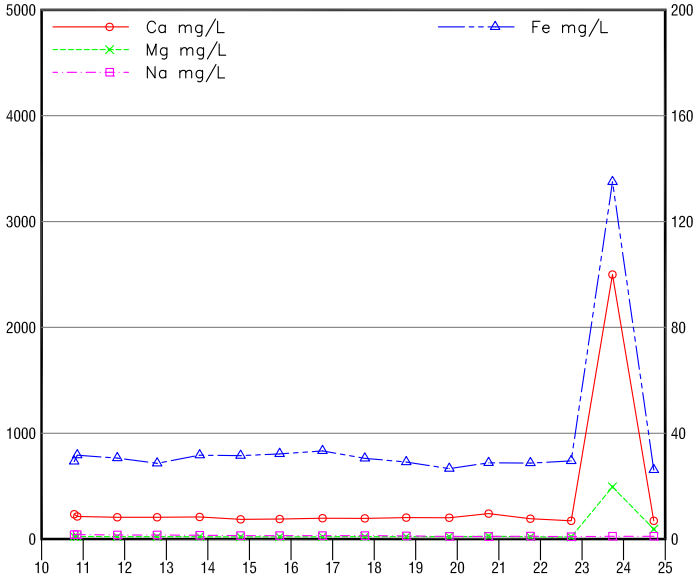
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW4-I

SAND AQUIFER

Screen 214.7 - 212.6 masl

22578520 27 Dec 24	wsp	24G007

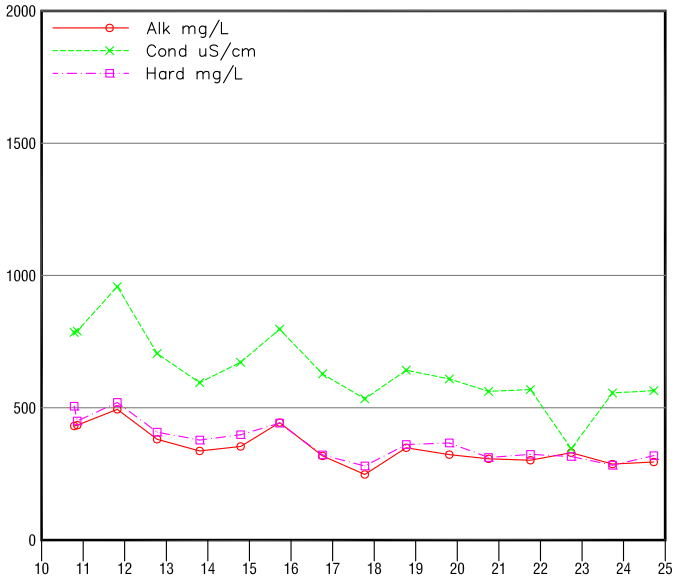
OW4-I

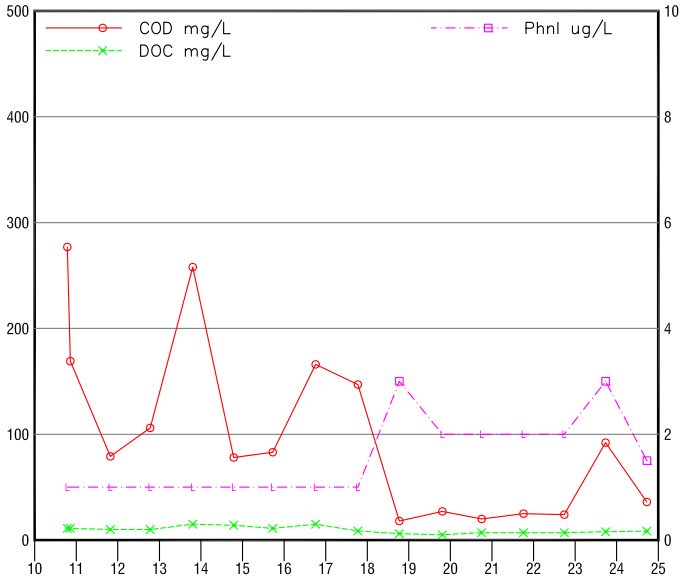
SAND AQUIFER

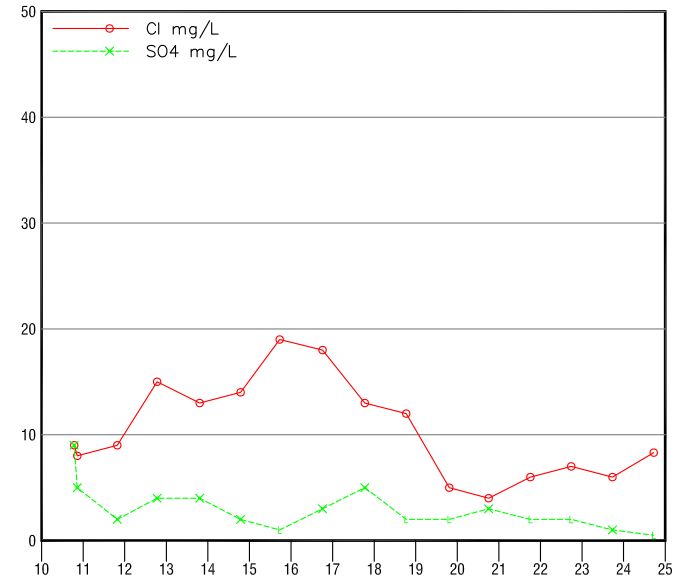
OBSERVATION WELL
Screen 214.7 - 212.6 masl

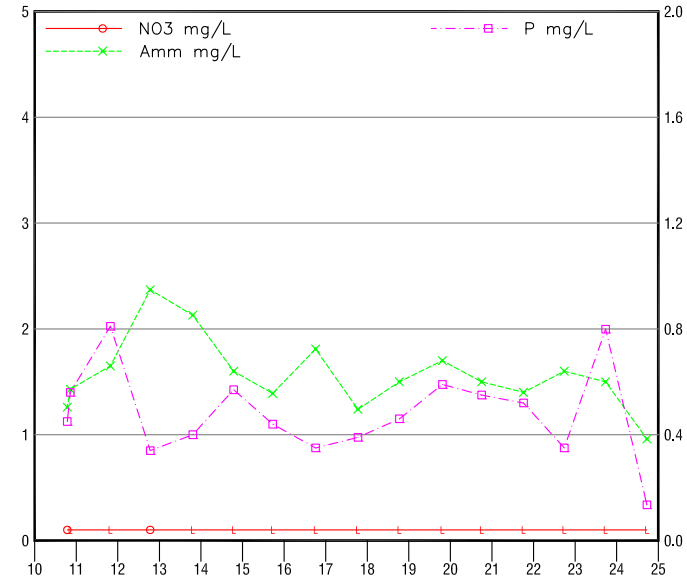
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
14-Oct-10	2120	675	1200	688	7.0	19	1	235	24	41	2.6	**29.3**	445	142	15	1.3	0.1	<0.1	0.28	<1	8.4
10-Nov-10	2185	669	1170	631	7.1	18	<1	213	24	42	2.2	**31.7**	503	126	16	1.3	<0.1	<0.1	0.35		6.0
28-Oct-11	2362	647	1230	609	7.4	17	<1	205	23	38	2.2	**30.6**	624	86	14	0.7	<0.1	<0.1	0.35	<1	5.4
12-Oct-12	2555	599	1040	603	8.1	21	<1	205	22	38	2.0	**28.6**	535	93	17	1.5	<0.1	<0.1	0.39	<1	8.2
21-Oct-13	2737	608	972	611	7.2	19	2	208	22	36	2.3	**31.7**	513		23	1.9	<0.1	<0.1	0.65	<1	8.2
15-Oct-14	2929	571	1030	552	7.3	20	<1	186	21	32	2.4	**31.5**	517	133	24	1.8	0.1	<0.1	0.53	<1	6.4
23-Sep-15	3136	618	1070	559	7.2	18	<1	189	21	32	2.0	**32.2**	519	117	17	2.1	<0.1	<0.1	0.75	<1	3.6
04-Oct-16	3281	617	1090	581	7.4	17	<1	196	22	32	2.2	**33.3**	525	165	19	1.9	<0.1	<0.1	0.85	<1	5.5
11-Oct-17	3458	560	1110	580	7.4	13	<1	195	23	32	2.5	**30.5**	526	166	13	2.0	<0.1	<0.1	1.01	<1	10.4
10-Oct-18	3625	674	999	602	7.3	19	<2	203	23	29	2.7	**29.1**	600	44	11	2.3	<0.1	<0.1	1.4	**3**	1.7
23-Oct-19	3813	570	1010	592	7.2	21	5	201	22	25	2.7	**26.6**	572	47	13	1.7	<0.1	<0.1	1.6	<2	7.6
02-Oct-20	4019	614	1030	711	7.6	12	2	240	27	24	3.2	**28.8**	715	43	11	1.8	<0.1	<0.1	1.9	<2	13.1
05-Oct-21	4193	573	1030	565	7.3	17	<2	192	21	27	2.7	**28.7**	590	44	16	2.2	<0.1	<0.1	1.8	<2	8.5
28-Sep-22	4351	567	672	507	7.0	15	<2	172	19	22	2.8	**29.5**	503	43	11	2.7	<0.1	<0.1	1.4	**4**	2.4
26-Sep-23	4528	575	1010	1190	7.2	13	<1	2500	493	26	2.7	**135**	11100	41	12	1.5	<0.1	<0.1	1.9	**2**	12.3
23-Sep-24	4651	560	1030	813	6.72	12.2	<1	173	93	26	3.1	**26.1**	459	243	14.2	1.6	<0.1	<0.1	1.23	**1.1**	10.2
TOTAL SAMPLES		16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	16	16	16	15	
AVERAGE 2024																					

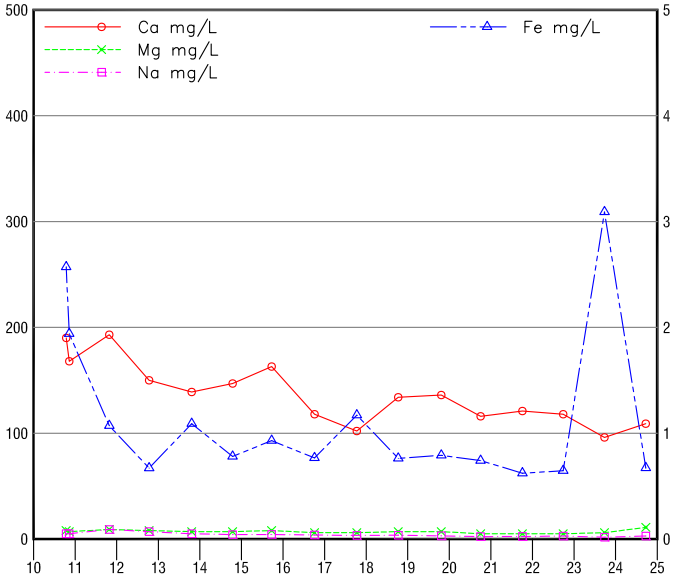
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW4-II

UPPER SAND / SILTY SAND

Screen 219.0 - 217.5 masl

22578520 27 Dec 24	WSP	24G008

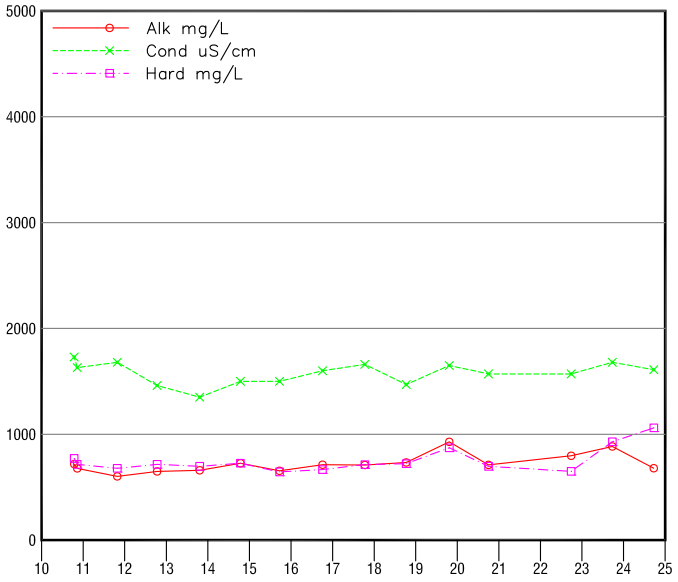
OW4-II

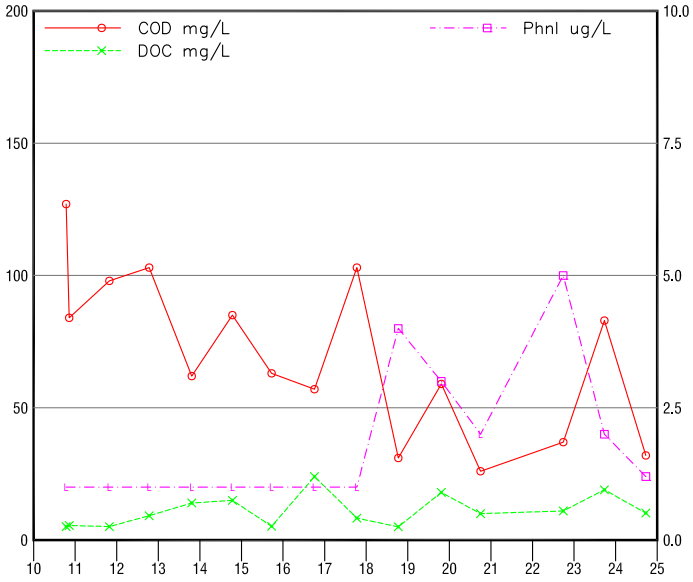
UPPER SAND / SILTY SAND

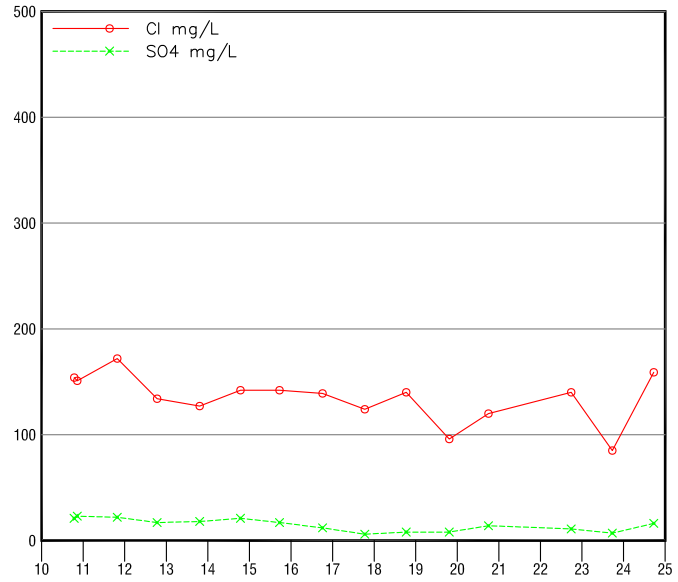
OBSERVATION WELL
Screen 219.0 - 217.5 masl

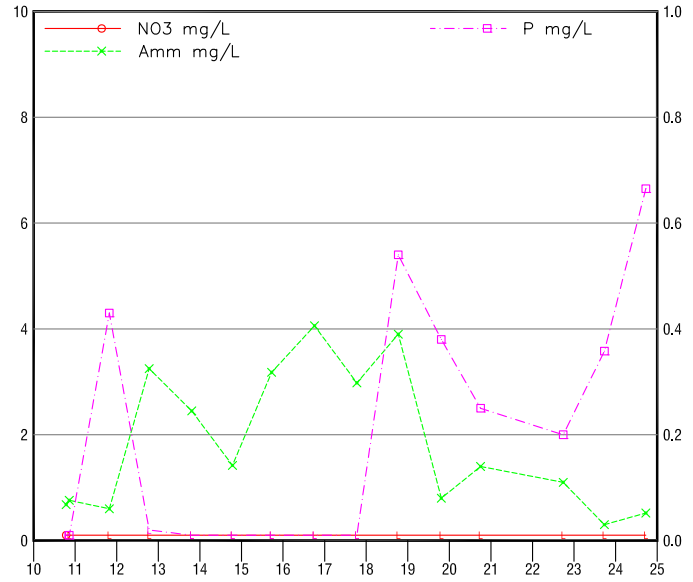
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
14-Oct-10	2121	431	785	506	7.1	9	9	190	8	5.0	4.2	**2.57**	484	277	11	2.4	0.1	<0.1	1.26	<1	8.0
10-Nov-10	2186	434	790	450	7.2	8	5	168	7	5.0	3.8	**1.94**	397	169	11	2.6	<0.1	<0.1	1.43		2.4
28-Oct-11	2363	494	958	520	7.4	9	2	193	9	9.0	5.2	**1.07**	396	79	10	3.5	<0.1	<0.1	1.65	<1	4.2
12-Oct-12	2556	381	705	408	8.3	15	4	150	8	7.0	4.9	**0.67**	327	106	10	3.6	0.1	<0.1	2.37	<1	3.8
21-Oct-13	2738	337	595	378	7.4	13	4	139	7	5.0	4.6	**1.09**	292	258	15	3.1	<0.1	<0.1	2.13	<1	5.6
15-Oct-14	2930	354	672	398	7.5	14	2	147	7	4.2	5.3	**0.78**	265	78	14	2.9	<0.1	<0.1	1.6	<1	5.6
23-Sep-15	3137	444	797	442	7.5	19	<1	163	8	4.3	6.0	**0.93**	329	83	11	3.1	<0.1	<0.1	1.39	<1	−0.7
04-Oct-16	3282	318	628	322	7.7	18	3	118	6	3.8	5.4	**0.766**	271	166	15	3.1	<0.1	<0.1	1.81	<1	−0.4
11-Oct-17	3459	248	534	280	7.7	13	5	102	6	3.4	5.2	**1.17**	232	147	8.6	2.3	<0.1	<0.1	1.24	<1	5.0
10-Oct-18	3626	349	642	361	7.7	12	<2	134	7	3.6	5.7	**0.762**	299	18	6.0	2.3	<0.1	<0.1	1.5	**3**	2.4
23-Oct-19	3814	323	609	367	7.4	5	<2	136	7	3.0	5.9	**0.791**	260	27	5.0	2.1	<0.1	<0.1	1.7	<2	8.1
02-Oct-20	4020	307	562	312	7.7	4	3	116	5	2.3	5.9	**0.741**	258	20	7.0	2.0	<0.1	<0.1	1.5	<2	2.3
05-Oct-21	4194	302	569	324	7.5	6	<2	121	5	2.4	6.0	**0.622**	268	25	7.0	1.4	<0.1	<0.1	1.4	<2	4.6
28-Sep-22	4352	330	345	316	7.3	7	<2	118	5	2.8	6.2	**0.645**	278	24	7.0	2.1	<0.1	<0.1	1.6	<2	−0.4
26-Sep-23	4529	287	556	283	7.5	6	1	96	6	1.7	6.6	**3.09**	270	92	7.9	2.5	<0.1	<0.1	1.5	**3**	11.5
23-Sep-24	4652	295	565	319	7.12	8.3	<0.5	109	11	2.8	5.7	**0.672**	289	36	8.4	1.2	<0.1	<0.1	0.96	**1.5**	9.9
TOTAL SAMPLES		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	
AVERAGE 2024																					

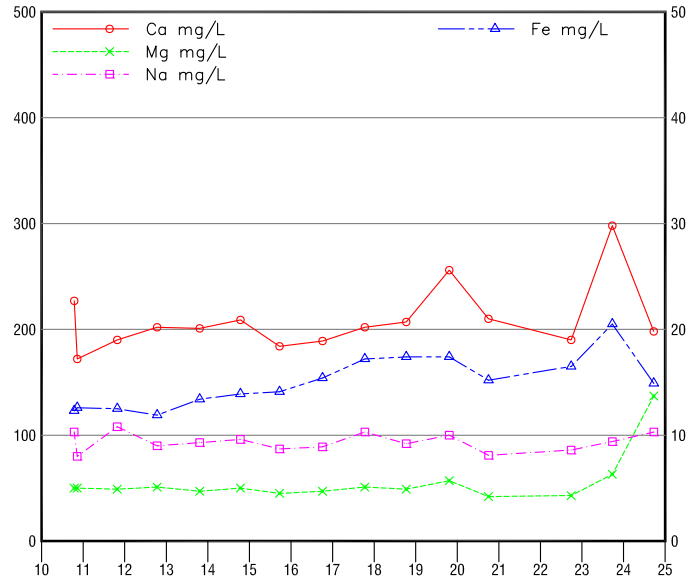
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW5-I

SAND AQUIFER

Screen 210.0 - 208.4 masl

22578520 27 Dec 24	wsp	24G009

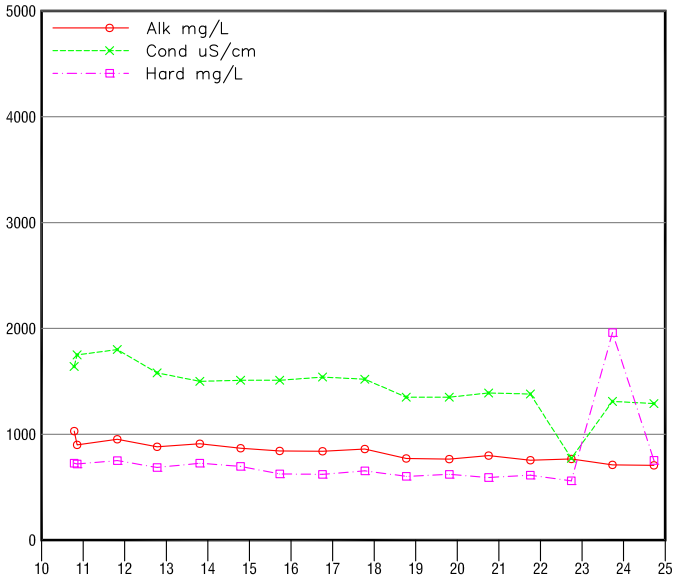
OW5-I

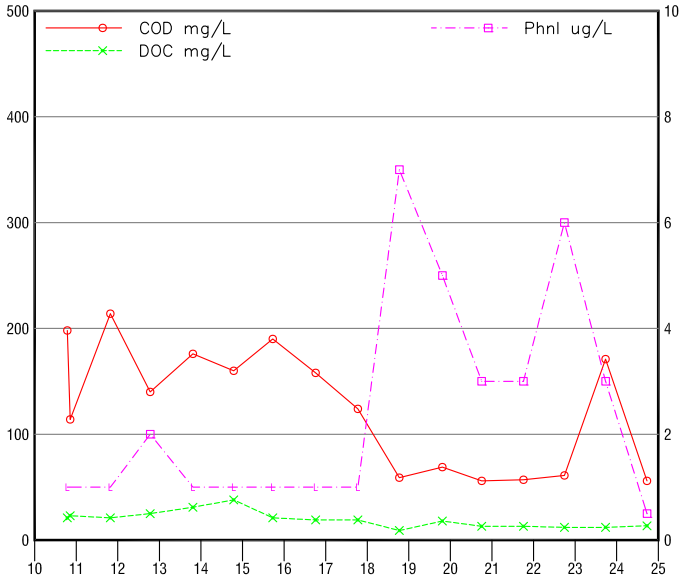
SAND AQUIFER

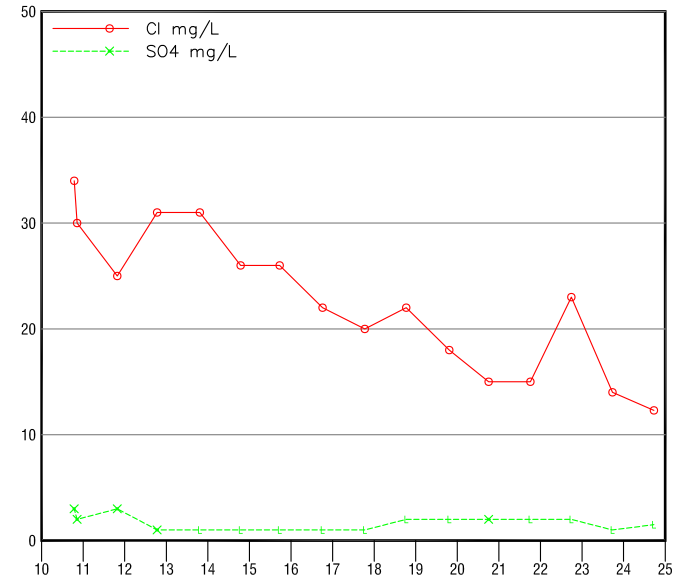
OBSERVATION WELL
Screen 210.0 - 208.4 masl

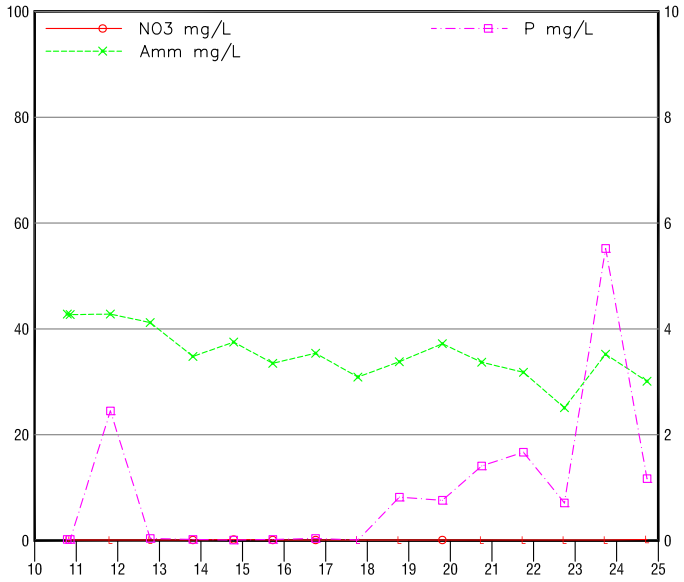
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	PhnI ug/L	Ion B %
	PWQO											0.3								1	
14-Oct-10	2122	718	1730	771	7.0	154	21	227	50	103	5.0	**12.3**	1860	127	5.1	1.6	0.1	<0.1	0.68	<1	3.5
10-Nov-10	2187	677	1630	715	7.1	151	23	172	50	80	5.0	**12.6**	1930	84	5.5	2.7	<0.1	<0.1	0.76		-4.1
28-Oct-11	2364	601	1680	678	7.5	172	22	190	49	108	4.5	**12.5**	1980	98	5.1	1.2	<0.1	<0.1	0.60	<1	4.1
12-Oct-12	2557	649	1460	715	7.9	134	17	202	51	90	6.5	**11.9**	1590	103	9.2	4.3	<0.1	<0.1	3.25	<1	5.3
21-Oct-13	2739	659	1350	697	7.2	127	18	201	47	93	6.2	**13.4**	1670	62	14	3.7	<0.1	<0.1	2.45	<1	4.5
14-Oct-14	2931	726	1500	726	7.3	142	21	209	50	96	5.3	**13.9**	1610	85	15	2.8	<0.1	<0.1	1.42	<1	1.3
23-Sep-15	3138	655	1500	644	7.3	142	17	184	45	87	5.5	**14.1**	1440	63	5.2	4.7	<0.1	<0.1	3.18	<1	0.3
04-Oct-16	3283	712	1600	666	7.5	139	12	189	47	89	6.4	**15.4**	1350	57	24	5.1	<0.1	<0.1	4.06	<1	-0.6
11-Oct-17	3460	709	1660	713	7.5	124	6	202	51	103	6.3	**17.2**	1290	103	8.3	4.2	<0.1	<0.1	2.98	<1	5.2
10-Oct-18	3627	733	1470	722	7.2	140	8	207	49	92	6.5	**17.4**	1330	31	5.0	3.3	<0.1	<0.1	3.9	**4**	1.8
23-Oct-19	3815	928	1650	872	6.9	96	8	256	57	100	3.5	**17.4**	1060	59	18	1.3	<0.1	<0.3	0.8	**3**	2.7
02-Oct-20	4021	710	1570	697	7.6	120	14	210	42	81	4.3	**15.2**	1160	26	10	1.2	<0.1	<0.1	1.4	<2	1.0
28-Sep-22	4397	796	1570	649	7.2	140	11	190	43	86	3.7	**16.5**	950	37	11	2.0	<0.1	<0.1	1.1	**5**	-6.9
25-Sep-23	4530	885	1680	929	7.2	85	7	298	63	94	2.7	**20.5**	852	83	19	0.5	<0.1	<0.1	0.3	**2**	12.8
23-Sep-24	4653	678	1610	1060	6.87	159	16.2	198	137	103	4.1	**14.9**	866	32	10.2	1.1	<0.1	<0.1	0.52	**1.2**	8.9
TOTAL SAMPLES		15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	
AVERAGE 2024																					

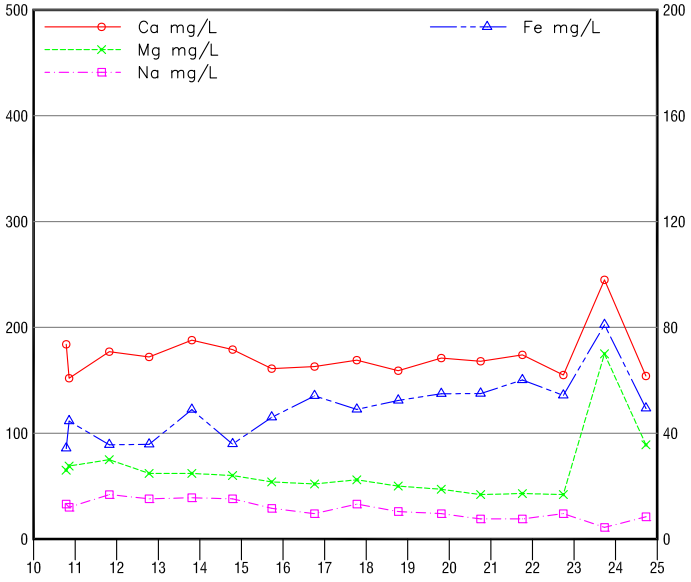
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L Concentration Reported Less Than

G Concentration Reported Greater Than

A Concentration Determined Anomalous

Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW6-I

SAND AQUIFER

Screen 217.1 - 214.1 masl

22578520 27 Dec 24	WSP	24G010

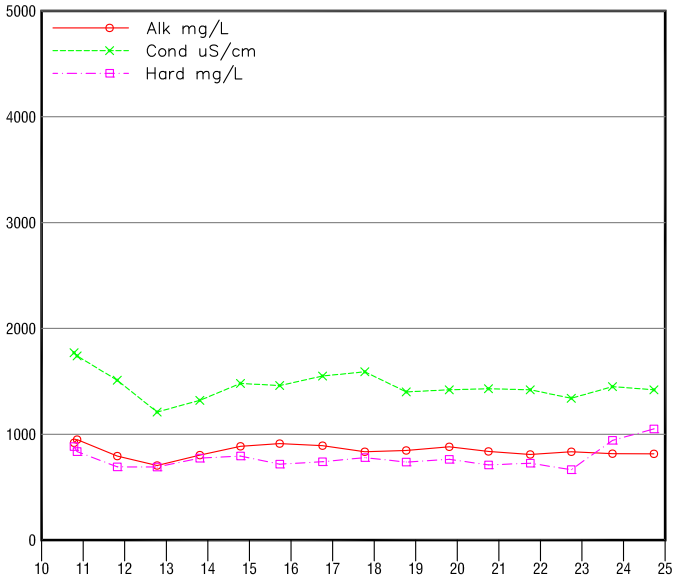
OW6-I

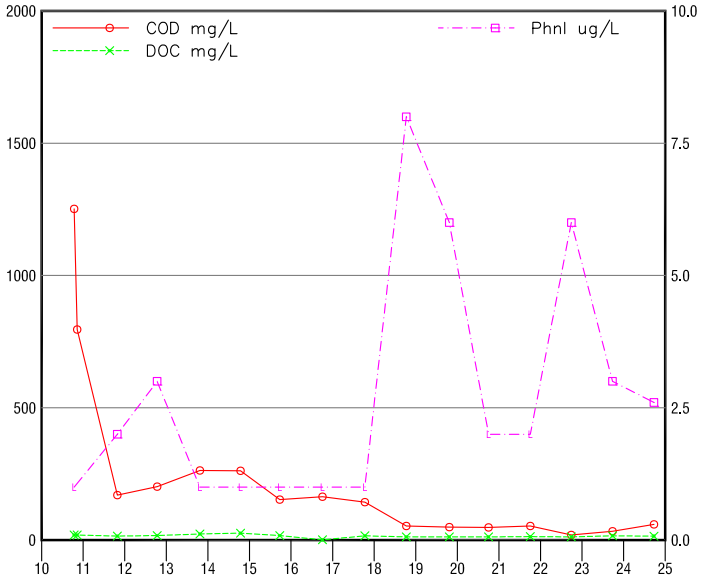
SAND AQUIFER

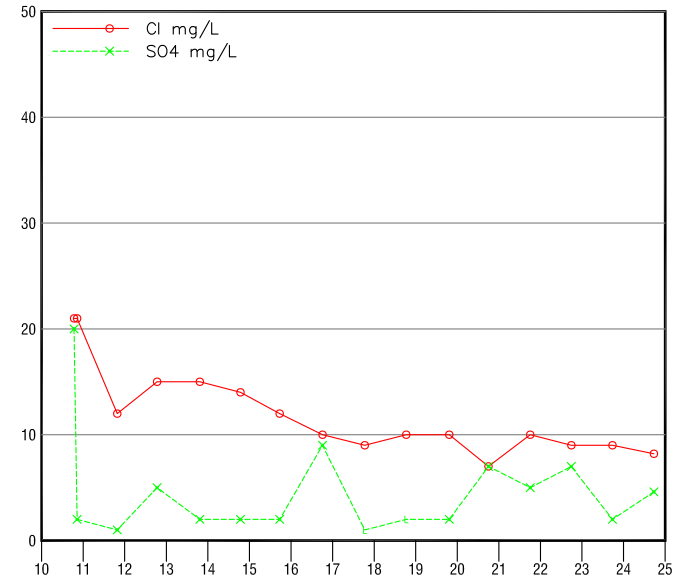
OBSERVATION WELL
Screen 217.1 - 214.1 masl

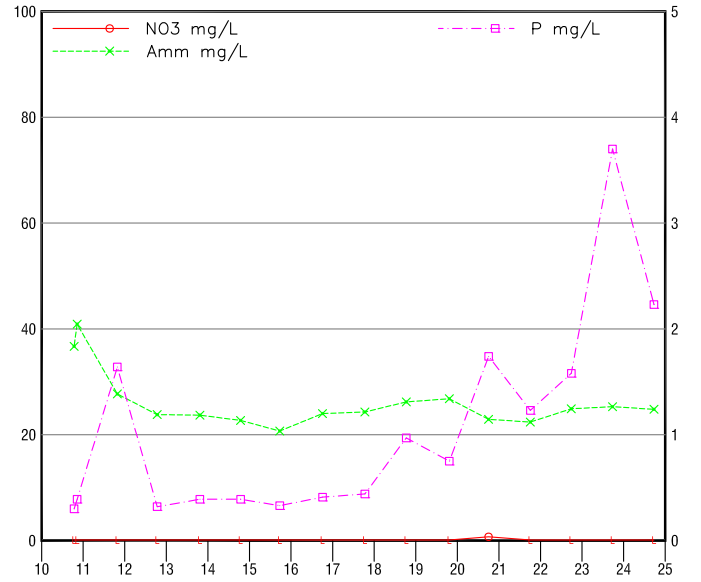
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	PhnI ug/L	Ion B %
	PWQO											0.3								1	
14-Oct-10	2124	1030	1640	726	7.0	34	3	184	65	33	51	**34.3**	812	198	21	51.8	<0.1	<0.1	42.8	<1	-0.1
09-Nov-10	2189	900	1750	719	7.0	30	2	152	69	30	52	**44.6**	880	114	23	55.9	<0.1	<0.1	42.7		4.2
28-Oct-11	2366	952	1800	751	7.4	25	3	177	75	42	45	**35.6**	1160	214	21	47.2	<0.1	<0.1	42.8	<1	6.0
12-Oct-12	2559	881	1580	686	7.9	31	1	172	62	38	42	**35.8**	876	140	25	45.5	<0.1	<0.1	41.2	**2**	5.5
22-Oct-13	2741	910	1500	726	7.1	31	<1	188	62	39	42	**48.9**	930	176	31	36.0	0.1	<0.1	34.8	<1	6.0
15-Oct-14	2933	868	1510	696	7.1	26	<1	179	60	38	42	**35.9**	882	160	38	38.0	0.2	<0.1	37.5	<1	6.4
24-Sep-15	3140	842	1510	625	7.3	26	<1	161	54	29	37	**46.0**	793	190	21	39.1	0.1	<0.1	33.5	<1	3.2
04-Oct-16	3285	839	1540	621	7.4	22	<1	163	52	24	41	**54.1**	632	158	19	41.9	0.1	<0.1	35.4	<1	4.3
11-Oct-17	3462	860	1520	654	7.4	20	<1	169	56	33	37	**49.0**	857	124	19	35.0	<0.1	<0.1	30.9	<1	4.4
10-Oct-18	3629	771	1350	602	6.9	22	<2	159	50	26	33	**52.4**	715	59	9.0	34.1	<0.1	<0.1	33.8	**7**	6.7
23-Oct-19	3817	765	1350	621	7.0	18	<2	171	47	24	38	**54.9**	539	69	18	37.4	0.1	<0.1	37.2	**5**	9.3
02-Oct-20	4023	798	1390	591	7.5	15	2	168	42	19	37	**55.0**	531	56	13	36.4	<0.1	<0.1	33.7	**3**	4.6
04-Oct-21	4195	754	1380	613	7.2	15	<2	174	43	19	36	**60.1**	495	57	13	34.2	<0.1	<0.1	31.8	**3**	5.4
29-Sep-22	4353	766	773	560	6.9	23	<2	155	42	24	28	**54.3**	553	61	12	27.1	<0.1	<0.1	25.1	**6**	2.1
26-Sep-23	4531	711	1310	1960	7.1	14	<1	245	175	11	26	**81.0**	3010	171	12	26.1	<0.1	<0.1	35.2	**3**	6.2
24-Sep-24	4654	706	1290	753	6.6	12.3	<1.5	154	89	21	29	**49.4**	414	56	13.5	28.7	<0.2	<0.2	30.1	0.5	4.8
TOTAL SAMPLES		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	
AVERAGE 2024																					

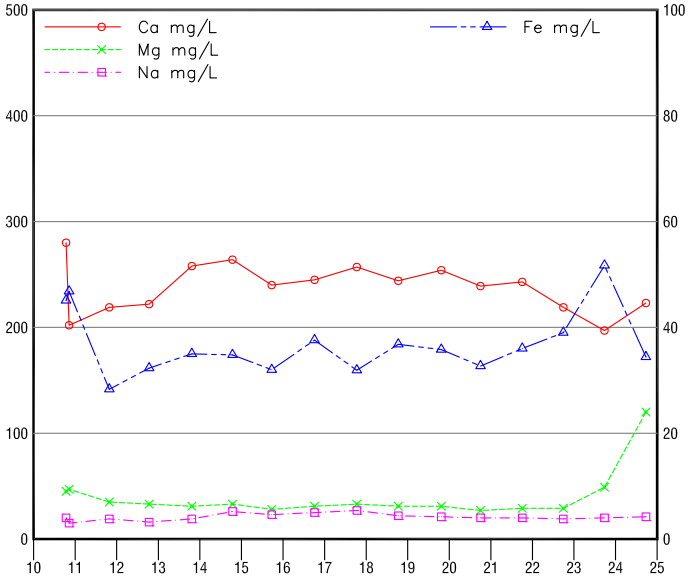
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW6-II

WASTE

Screen 219.9 - 217.4 masl

22578520 27 Dec 24	wsp	24G011

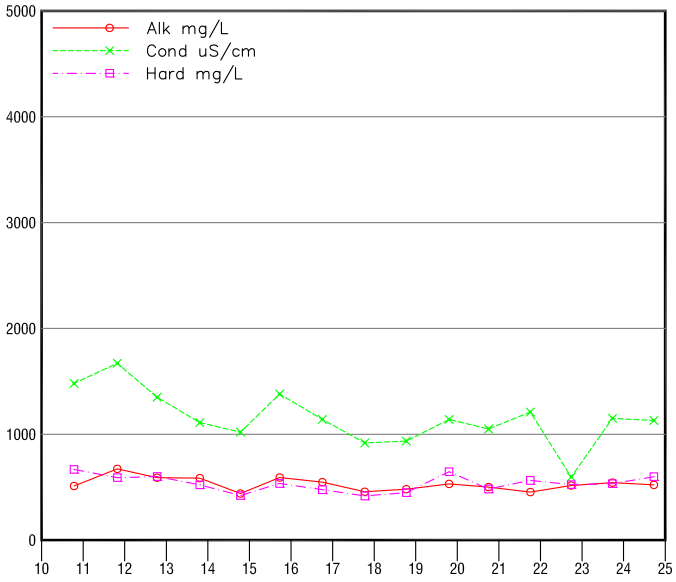
OW6-II

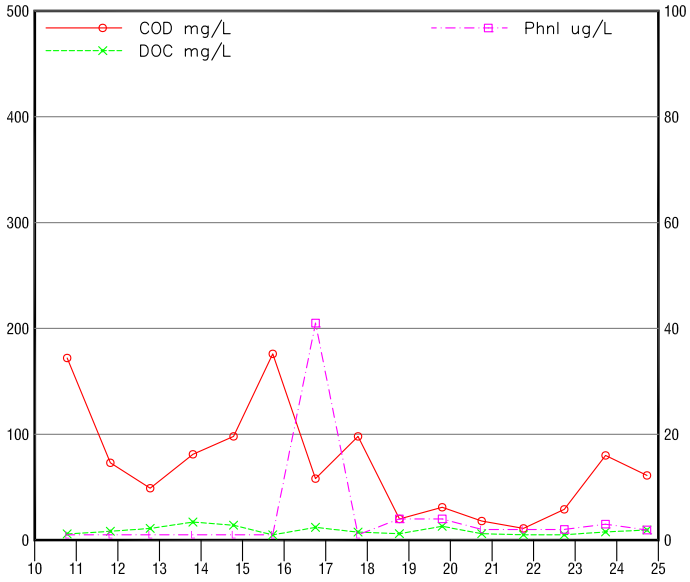
WASTE

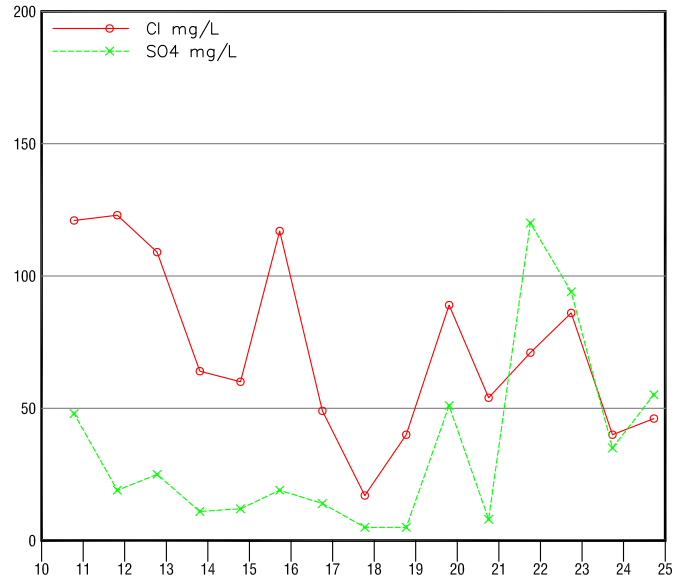
OBSERVATION WELL
Screen 219.9 - 217.4 masl

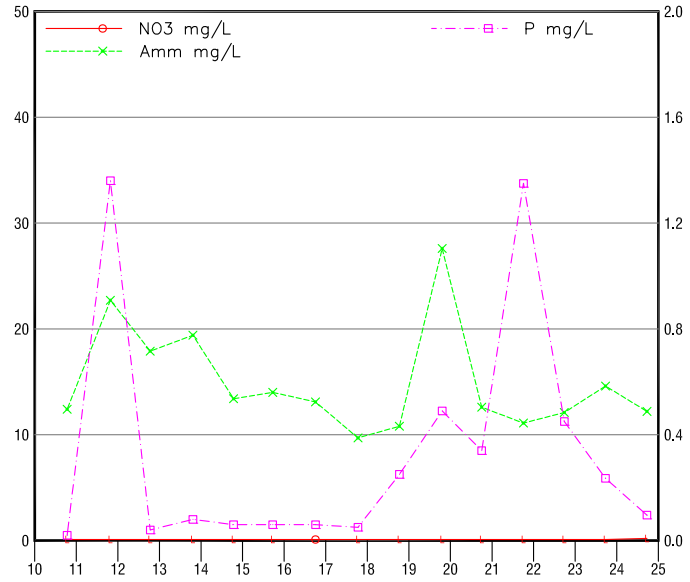
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
13-Oct-10	2125	919	1770	884	6.9	21	20	280	45	20	36	**45.1**	1650	1252	19	41.6	<0.1	<0.1	36.7	<1	10.1
09-Nov-10	2190	950	1740	836	6.9	21	2	202	47	15	34	**46.8**	1510	796	19	42.5	<0.1	<0.1	40.9		1.1
28-Oct-11	2367	793	1510	692	7.3	12	1	219	35	19	25	**28.3**	1350	170	15	30.4	<0.1	<0.1	27.7	**2**	6.0
12-Oct-12	2560	704	1210	690	8.0	15	5	222	33	16	23	**32.3**	1080	202	17	29.0	<0.1	<0.1	23.8	**3**	10.3
22-Oct-13	2742	802	1320	774	7.1	15	2	258	31	19	23	**35.0**	1420	263	23	26.0	<0.1	<0.1	23.7	<1	9.1
15-Oct-14	2934	886	1480	794	8.1	14	2	264	33	26	25	**34.8**	1500	262	26	27.0	<0.1	<0.1	22.7	<1	6.2
24-Sep-15	3141	912	1460	717	7.3	12	2	240	28	23	20	**32.0**	1540	153	17	25.2	<0.1	<0.1	20.7	<1	-0.5
04-Oct-16	3286	892	1550	740	7.4	10	9	245	31	25	23	**37.6**	1560	164	0.9	27.8	<0.1	<0.1	24	<1	3.2
11-Oct-17	3463	835	1590	779	7.4	9	<1	257	33	27	25	**31.9**	1650	143	16	28.0	<0.1	<0.1	24.3	<1	8.9
10-Oct-18	3630	846	1400	737	6.8	10	<2	244	31	22	23	**36.8**	1660	53	12	27.6	<0.1	<0.1	26.2	**8**	6.2
23-Oct-19	3818	881	1420	763	6.9	10	2	254	31	21	23	**35.8**	1700	49	12	25.4	<0.1	<0.1	26.8	**6**	5.3
02-Oct-20	4024	838	1430	710	7.5	7	7	239	27	20	21	**32.7**	1490	48	12	23.3	0.7	0.1	22.9	<2	3.5
04-Oct-21	4196	809	1420	726	7.2	10	5	243	29	20	22	**36.0**	1490	53	13	24.8	<0.1	<0.1	22.4	<2	4.1
29-Sep-22	4354	835	1340	665	7.0	9	7	219	29	19	20	**39.0**	1380	19	12	27.6	<0.1	<0.1	24.9	**6**	2.1
26-Sep-23	4532	817	1450	942	6.9	9	2	197	49	20	18	**51.7**	2000	33	16	23.2	<0.1	<0.1	25.3	**3**	8.1
24-Sep-24	4655	815	1420	1050	6.52	8.2	4.6	223	120	21	21	**34.4**	1260	59	14.7	24	<0.1	<0.1	24.8	**2.6**	5.2
TOTAL SAMPLES		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	
AVERAGE 2024																					

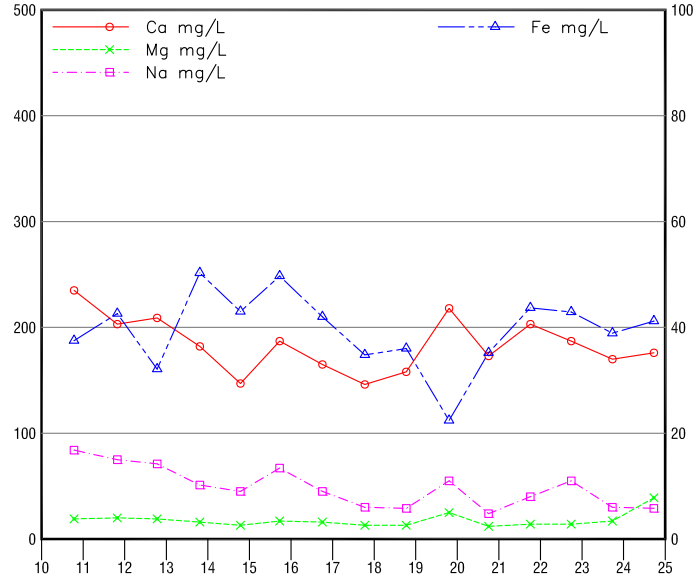
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L Concentration Reported Less Than

G Concentration Reported Greater Than

A Concentration Determined Anomalous

Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW7

FORMERLY -KP1
CONVERTED Apr 11

SAND AQUIFER

Screen 218.9 - 213.1 masl

22578520 27 Dec 24	wsp	24G012

OW7

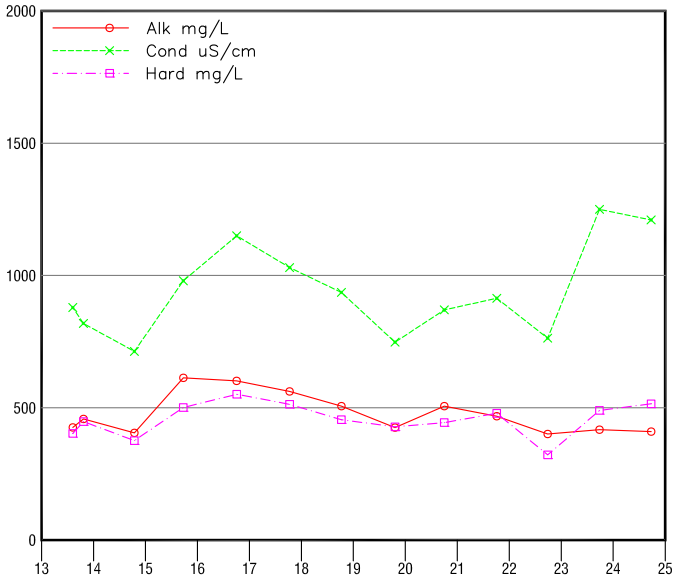
SAND AQUIFER

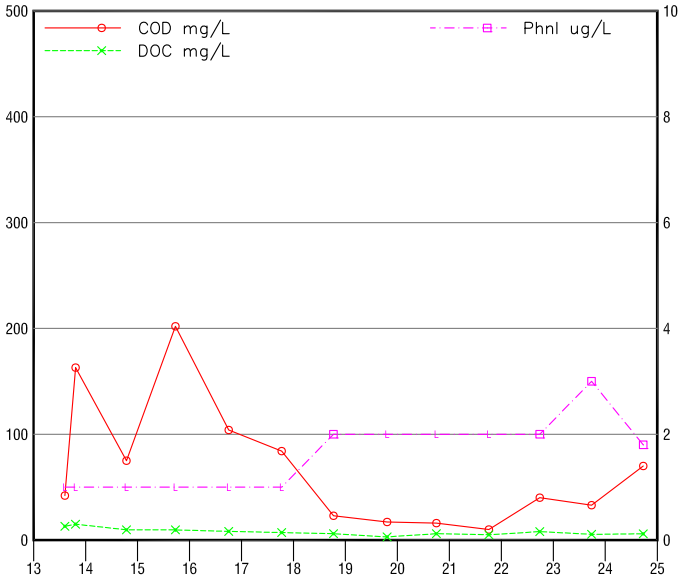
OBSERVATION WELL
Screen 218.9 - 213.1 masl

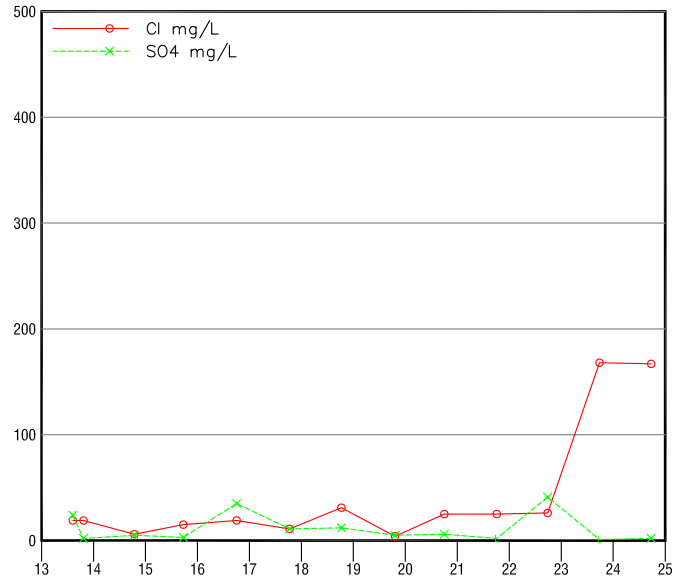
FORMERLY GP-KP1
CONVERTED Apr 11

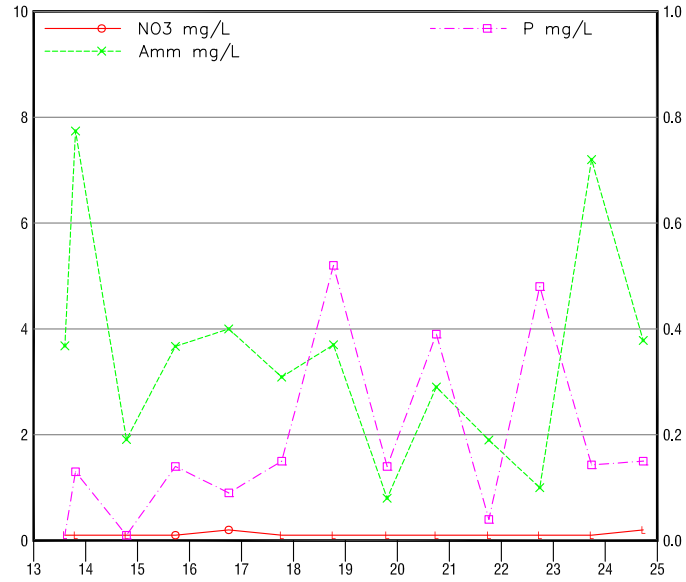
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
13-Oct-10	2126	511	1480	667	7.0	121	48	235	19	84	12	**37.5**	1080	172	5.8	13.5	<0.1	<0.1	12.4	<1	14.2
28-Oct-11	2368	673	1670	590	7.4	123	19	203	20	75	10	**42.6**	1020	73	8.3	24.5	<0.1	<0.1	22.7	<1	3.2
12-Oct-12	2561	590	1350	600	7.8	109	25	209	19	71	11	**32.1**	970	49	11	20.0	<0.1	<0.1	17.9	<1	7.3
22-Oct-13	2743	585	1110	522	7.1	64	11	182	16	51	11	**50.3**	734	81	17	21.0	<0.1	<0.1	19.4	<1	7.9
14-Oct-14	2935	440	1020	421	7.1	60	12	147	13	45	8.7	**43.0**	730	98	14	15.0	<0.1	<0.1	13.4	<1	9.9
23-Sep-15	3142	591	1380	535	7.3	117	19	187	17	67	8.7	**49.7**	1140	176	4.9	15.8	<0.1	<0.1	14	<1	3.6
03-Oct-16	3287	547	1140	476	7.4	49	14	165	16	45	7.9	**42.0**	795	58	12	13.5	0.1	<0.1	13.1	**41**	5.7
11-Oct-17	3464	456	918	417	7.5	17	5	146	13	30	6.8	**34.8**	682	98	7.5	10.6	<0.1	<0.1	9.7	<1	9.7
10-Oct-18	3631	481	935	448	7.1	40	5	158	13	29	6.8	**36.0**	769	20	6.0	12.6	<0.1	<0.1	10.8	**4**	6.9
21-Oct-19	3819	531	1140	646	7.2	89	51	218	25	55	17	**22.4**	1440	31	13	26.3	<0.1	<0.1	27.6	**4**	13.3
02-Oct-20	4025	500	1050	482	7.5	54	8	173	12	24	7.0	**35.2**	822	18	6.0	13.6	<0.1	<0.1	12.6	<2	5.5
04-Oct-21	4197	454	1210	564	7.2	71	120	203	14	40	5.9	**43.7**	817	11	5.0	12.8	<0.1	<0.1	11.1	<2	6.7
28-Sep-22	4355	515	596	524	6.9	86	94	187	14	55	5.8	**42.9**	794	29	5.0	13.4	<0.1	<0.1	12.1	**2**	2.3
25-Sep-23	4533	543	1150	533	7.2	40	35	170	17	30	7.1	**38.9**	1000	80	7.7	10.0	<0.1	<0.1	14.6	**3**	7.7
23-Sep-24	4656	521	1130	599	6.59	46.1	55.1	176	39	29	7.8	**41.2**	818	61	9.5	12.2	<0.2	<0.2	12.2	**1.9**	2.7
TOTAL SAMPLES		15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	
AVERAGE 2024																					

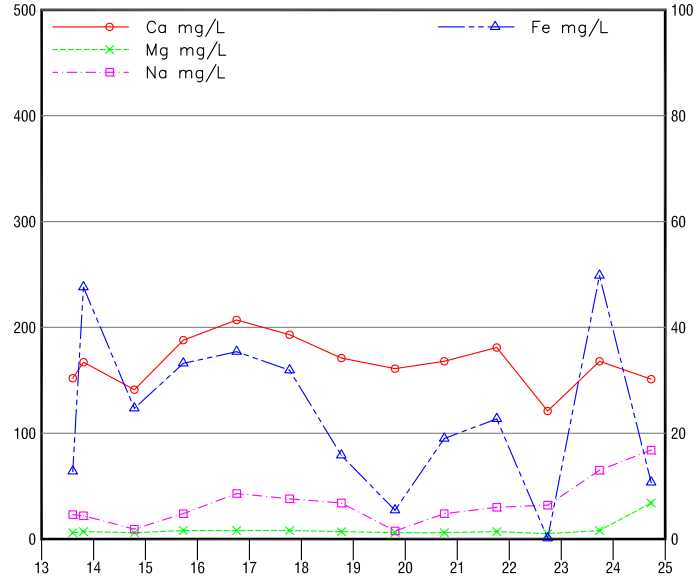
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW8

SAND AQUIFER

Screen 221.3 - 219.0 masl

22578520 27 Dec 24	WSP	24G013

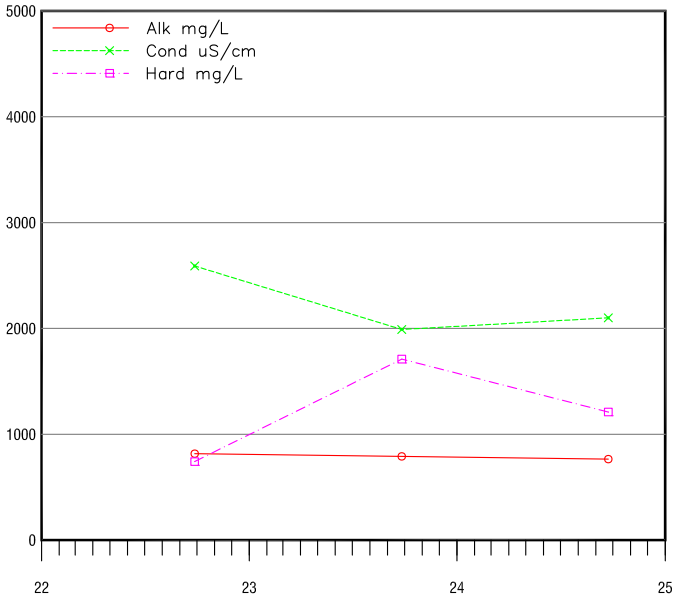
OW8

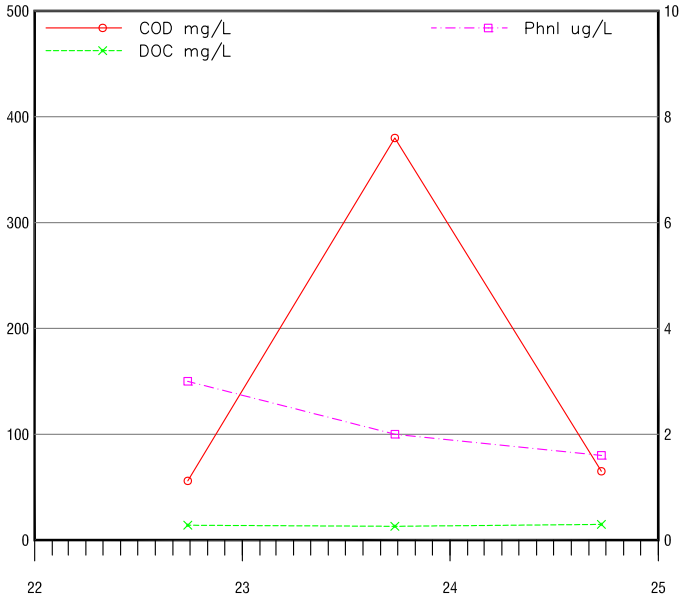
SAND AQUIFER

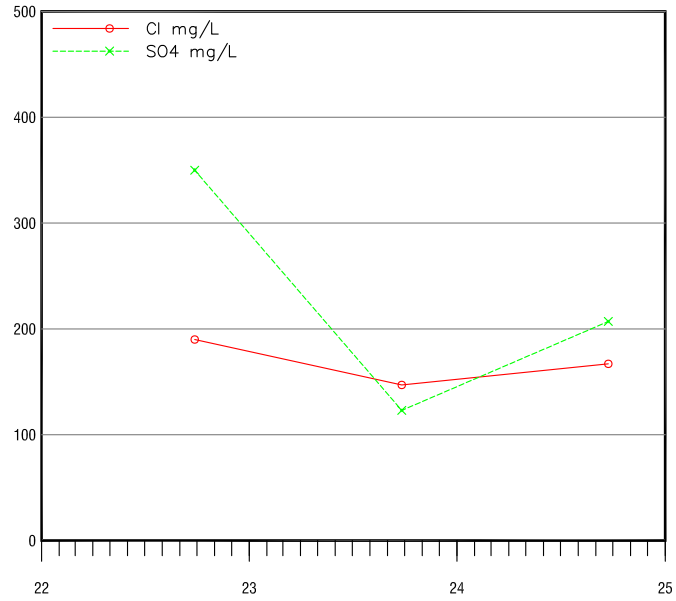
OBSERVATION WELL
Screen 221.3 - 219.0 masl

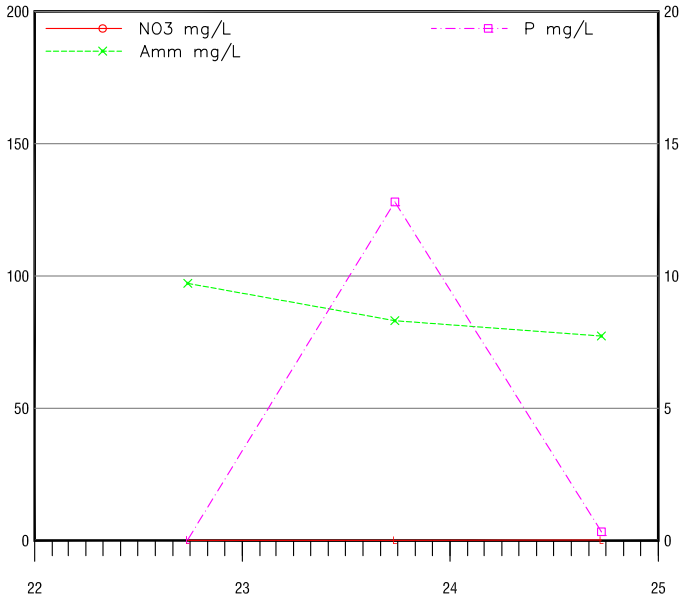
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
08-Aug-13	2662	426	879	403	7.1	19	24	152	6	23	4.8	**12.8**	1250	42	13	4.1	<0.1	<0.1	3.68	<1	1.9
22-Oct-13	2744	458	819	448	7.2	19	2	167	7	22	6.8	**47.6**	1210	163	15	7.9	<0.1	<0.1	7.74	<1	11.7
15-Oct-14	2936	405	713	376	7.2	6	5	141	6	9.3	3.7	**24.7**	1420	75	9.7	2.8	<0.1	<0.1	1.91	<1	3.8
24-Sep-15	3143	613	980	501	7.6	15	3	188	8	24	6.0	**33.2**	1420	202	9.6	4.6	0.1	<0.1	3.67	<1	-0.4
03-Oct-16	3288	602	1150	551	7.6	19	35	207	8	43	6.7	**35.4**	1710	104	8.2	5.2	0.2	<0.1	4.0	<1	4.7
10-Oct-17	3465	562	1030	513	7.5	11	11	193	8	38	6.9	**31.9**	1470	84	7.1	4.6	<0.1	<0.1	3.09	<1	6.6
09-Oct-18	3632	506	936	455	7.1	31	12	171	7	34	6.4	**15.8**	959	23	6.0	4.0	<0.1	<0.1	3.7	**2**	1.4
21-Oct-19	3820	425	748	428	6.9	4	5	161	6	7.6	4.6	**5.45**	984	17	3.0	1.0	<0.1	<0.1	0.8	<2	3.0
01-Oct-20	4026	506	870	444	7.2	25	6	168	6	24	6.0	**19.0**	782	16	6.0	2.8	<0.1	<0.1	2.9	<2	0.1
05-Oct-21	4198	468	914	479	7.4	25	<2	181	7	30	6.4	**22.7**	764	10	5.0	2.2	<0.1	<0.1	1.9	<2	10.2
28-Sep-22	4356	401	763	322	7.6	26	41	121	5	32	5.1	0.135	421	40	8.0	1.8	<0.1	<0.1	1.0	**2**	-9.0
27-Sep-23	4534	417	1250	490	7.2	168	<1	168	8	65	8.9	**49.8**	772	33	5.4	5.7	<0.1	<0.1	7.2	**3**	4.5
24-Sep-24	4657	410	1210	515	6.79	167	2.1	151	34	84	8.5	**10.7**	527	70	5.9	5.2	<0.2	<0.2	3.78	**1.8**	2.5
TOTAL SAMPLES		13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	
AVERAGE 2024																					

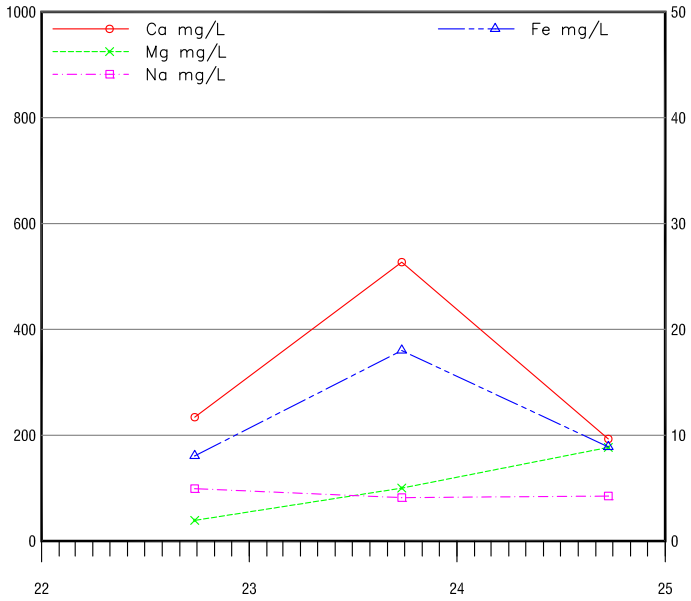
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW9-I

SAND AQUIFER CONTACT

Screen 215.7 - 214.0 masl

22578520 27 Dec 24	WSP	24G014

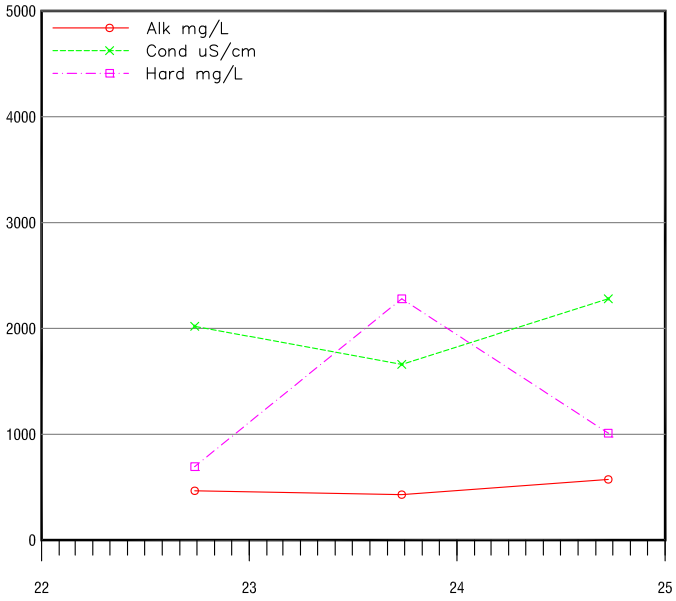
OW9-I

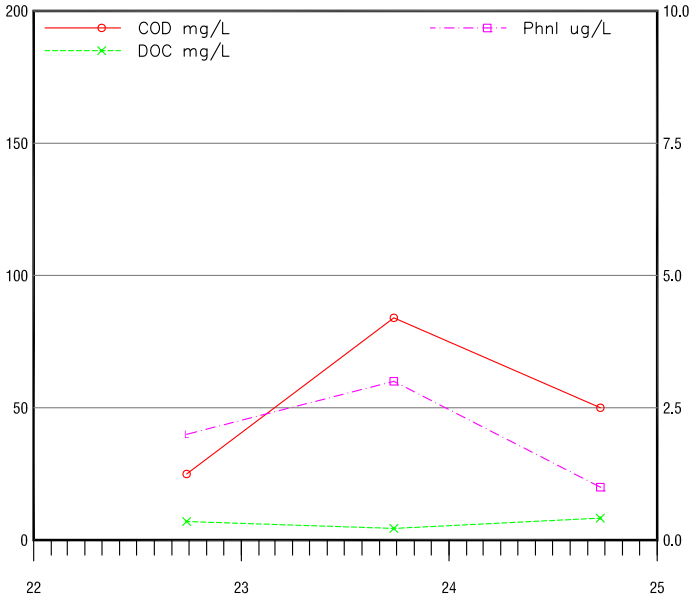
SAND AQUIFER CONTACT

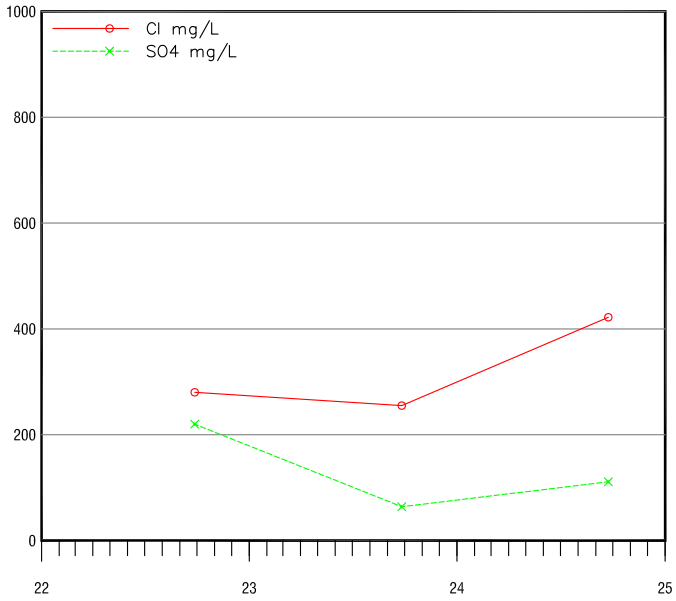
OBSERVATION WELL
Screen 215.7 - 214.0 masl

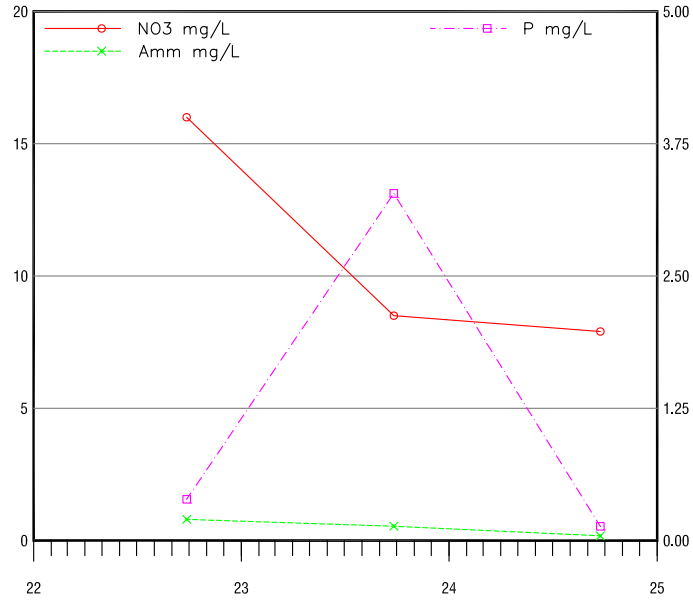
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	PhnI ug/L	Ion B %
	PWQO											0.3								1	
27-Sep-22	4357	817	2590	742	7.9	190	350	234	39	99	29	**8.04**	489	56	14	96.5	<0.1	<0.1	97.2	**3**	-3.3
26-Sep-23	4535	791	1990	1710	7.3	147	123	527	100	82	26	**18.0**	1620	380	13	46.5	<0.1	<0.1	83.1	**2**	-3.1
23-Sep-24	4658	765	2100	1210	7.04	167	207	193	177	85	27	**8.89**	348	65	14.8	75	<0.2	<0.2	77.3	**1.6**	-7.5
TOTAL SAMPLES		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
AVERAGE 2024																					

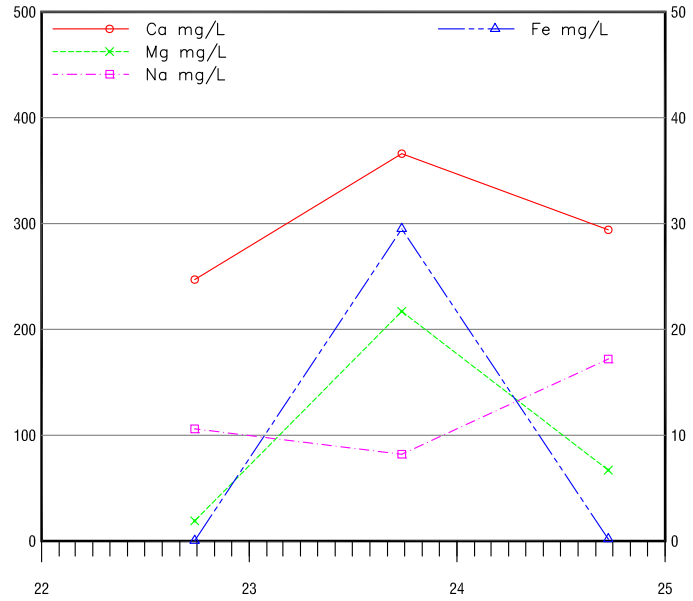
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**











L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted

CITY OF ORILLIA

KITCHENER PARK CLOSED LANDFILL

OW9-II

UPPER SAND / SILTY SAND

Screen 219.8 - 216.7 masl

22578520 27 Dec 24	wsp	24G015

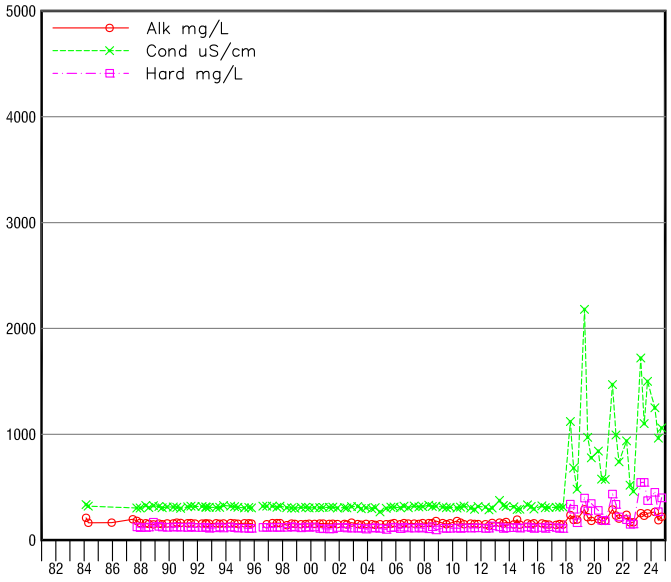
OW9-II

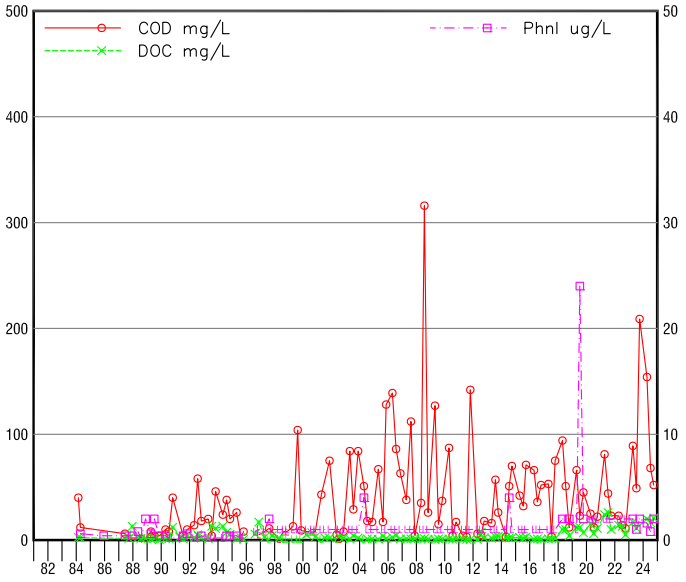
UPPER SAND / SILTY SAND

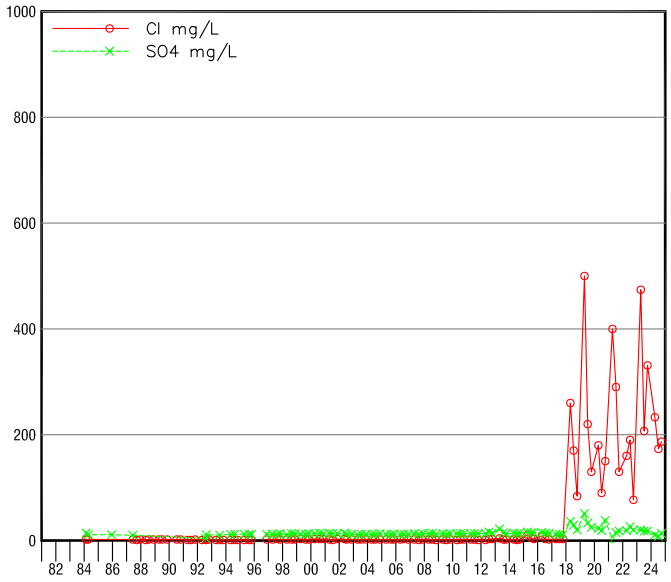
OBSERVATION WELL
Screen 219.8 - 216.7 masl

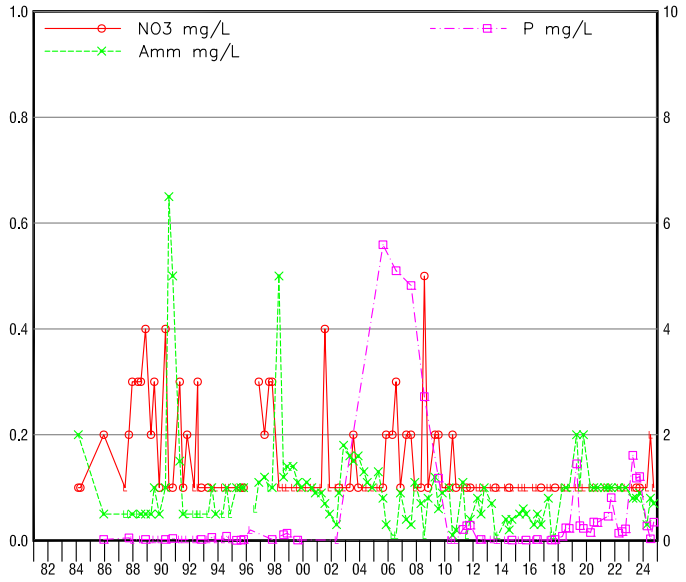
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
27-Sep-22	4358	466	2020	694	8.0	280	220	247	19	106	15	0.029	906	25	7.0	2.0	16	0.1	0.8	<2	-9.6
26-Sep-23	4536	430	1660	2280	7.6	255	64	366	217	82	12	**29.5**	5880	84	4.4	0.7	8.5	<0.1	0.54	**3**	7.9
23-Sep-24	4659	573	2280	1010	6.86	422	111	294	67	172	13	0.178	849	50	8.3	0.8	7.9	<0.5	0.18	1	2.1
TOTAL SAMPLES		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
AVERAGE 2024																					

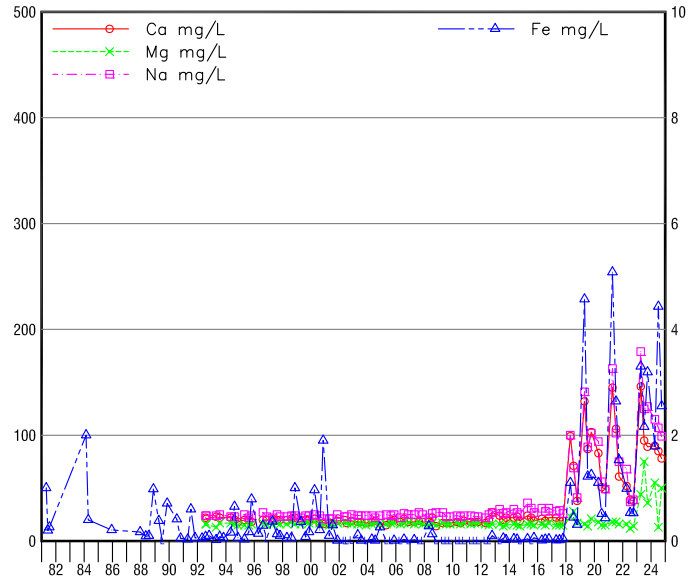
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**









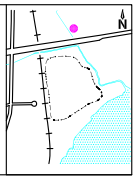


L Concentration Reported Less Than

G Concentration Reported Greater Than

A Concentration Determined Anomalous

Anomaly Not Plotted



CITY OF ORILLIA

KITCHENER STREET WASTE DIVERSION SITE

BH1-IR

FORMERLY 1-1
CONVERTED Jul 12

SAND AQUIFER

Screen 209.7 - 208.2 masl

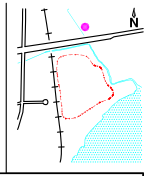
22578520 24 Dec 24	wsp	24G001

BH1-IR

SAND AQUIFER

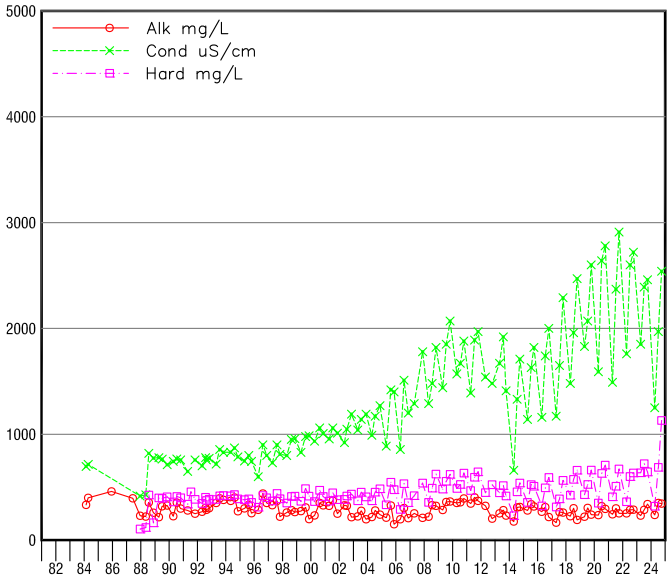
OBSERVATION WELL
Screen 209.7 - 208.2 masl

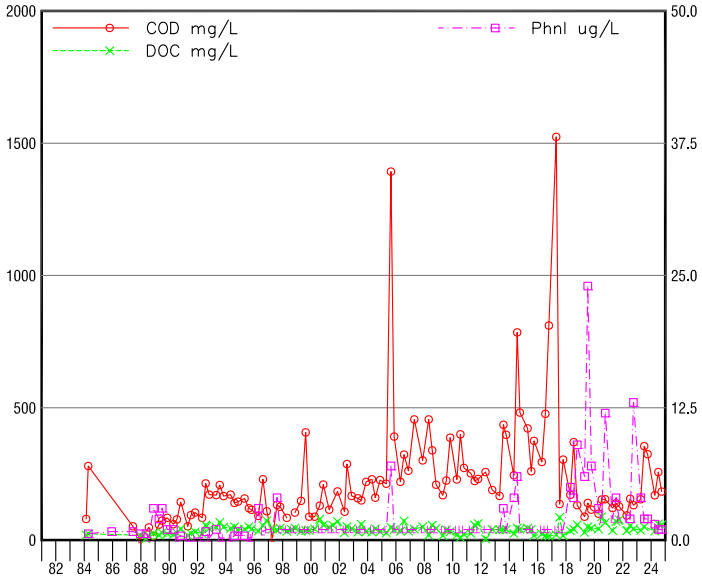
FORMERLY BH1-1
CONVERTED Jul 12

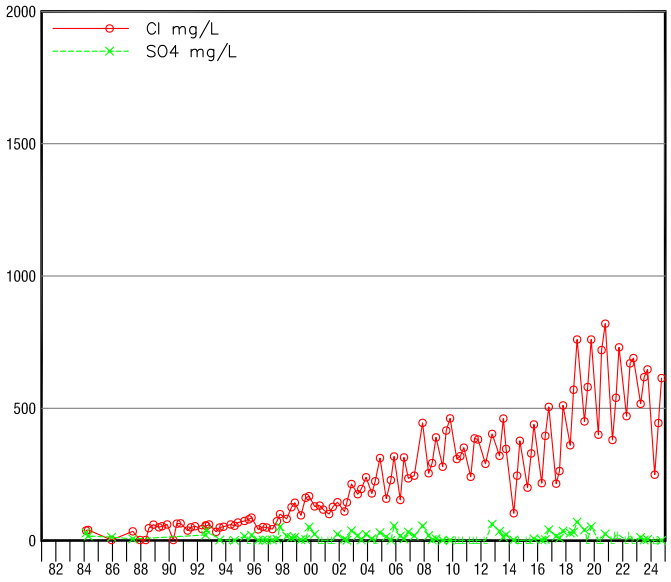


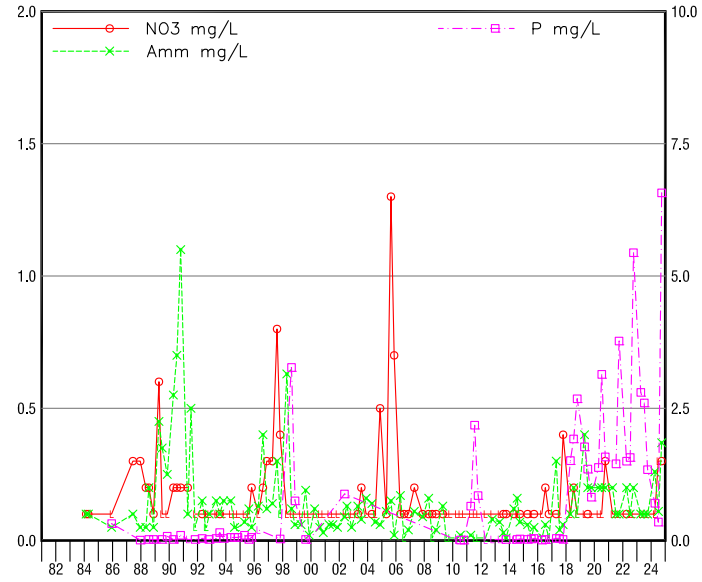
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
15-Apr-15	2972	157	333	124	8.1	11	16	24	16	36	2.1	0.04	50	42	2.5	0.3	<0.1	<0.1	0.05	<1	4.5
20-Jul-15	3032	150	318	118	8.0	5	15	22	16	31	1.8	<0.01	40	32	1.7	0.3	<0.1	<0.1	0.06	<1	5.0
28-Sep-15	3091	158	294	109	7.9	3	15	19	15	27	1.7	0.06	44	71	2.8	0.8	<0.1	<0.1	0.05	<1	-2.1
19-Apr-16	3163	157	324	119	8.0	9	15	21	16	31	1.8	0.013	32	66	0.8	0.2	<0.1	<0.1	0.03	<1	0.8
17-Jul-16	3199	149	306	110	8.1	3	14	19	15	28	1.5	0.03	26	36	1.0	0.3	<0.1	<0.1	0.05	<1	1.3
17-Oct-16	3291	146	307	126	8.0	2	14	22	17	31	1.6	0.035	42	52	0.8	0.7	0.1	0.1	0.03	<1	8.6
24-Apr-17	3326	144	310	118	8.1	3	12	22	15	28	1.5	0.016	57	53	1.1	0.4	<0.1	<0.1	0.08	<1	5.6
18-Jul-17	3392	151	313	110	8.1	3	12	19	15	29	1.5	0.018	34	3	1.2	0.3	<0.1	<0.1	<0.01	<1	3.3
17-Oct-17	3468	146	311	109	8.2	3	11	19	15	26	1.5	0.043	36	75	1.5	0.2	0.1	<0.1	<0.01	<1	3.2
23-Apr-18	3519	236	1120	339	7.6	260	36	99	23	100	3.2	**1.10**	348	94	10	0.6	<0.1	<0.1	<0.1	**2**	-5.8
16-Jul-18	3572	191	681	291	8.1	170	29	71	28	69	3.3	**0.443**	285	51	10	1.9	<0.1	<0.1	0.1	<2	-1.4
15-Oct-18	3645	194	480	164	8.1	84	20	38	17	41	1.9	**0.309**	95	12	4.0	<0.5	<0.1	<0.1	<0.1	**2**	-12.0
23-Apr-19	3697	290	2180	397	7.0	500	51	132	16	141	2.1	**4.57**	576	66	12	1.1	<0.1	<0.1	0.2	<1	-19.0
15-Jul-19	3474	216	970	276	7.4	220	33	87	14	89	2.1	**1.22**	347	23	12	0.7	<0.1	<0.1	<0.1	**24**	-7.9
15-Oct-19	3823	182	777	345	7.8	130	25	103	21	102	2.5	**1.25**	348	45	7.0	1.0	<0.1	<0.1	0.2	**2**	18.7
14-Apr-20	3859	198	841	280	8.1	180	23	83	18	94	2.3	**1.10**	308	25	15	<0.5	<0.1	<0.1	<0.1	<2	1.9
08-Jul-20	3911	181	576	187	8.0	90	19	51	15	56	1.8	**0.513**	177	12	6.0	<0.5	<0.1	<0.1	0.1	<2	-2.4
08-Oct-20	3967	181	573	183	7.9	150	38	49	15	49	1.9	**0.432**	146	22	11	0.6	<0.1	<0.1	0.1	<2	-19.1
13-Apr-21	4039	289	1470	435	7.0	400	<2	145	18	163	2.1	**5.08**	786	81	24	1.1	<0.1	<0.3	0.1	<2	-3.0
12-Jul-21	4093	231	993	337	7.9	290	15	106	18	102	2.3	**2.64**	463	44	26	0.9	<0.1	<0.1	0.1	<2	-7.0
29-Sep-21	4151	202	739	218	8.1	130	18	61	16	75	1.9	**1.53**	262	23	10	1.3	<0.1	<0.1	0.1	<2	-1.8
11-Apr-22	4217	238	937	193	7.8	160	19	52	16	68	1.7	**0.989**	207	23	14	<0.5	<0.1	<0.1	0.1	<2	-16.8
11-Jul-22	4285	168	519	149	8.0	190	26	39	12	37	1.5	**0.533**	145	14	13	0.7	<0.1	<0.1	<0.1	<2	-32.2
04-Oct-22	4361	167	459	152	8.0	77	20	38	14	39	1.6	**0.526**	122	11	5	<0.5	<0.1	<0.1	0.1	<2	-10.4
11-Apr-23	4413	254	1720	544	7.5	474	20	146	44	179	2.1	**3.30**	567	89	17	2.9	<0.1	0.2	0.08	**2**	0.0
10-Jul-23	4462	229	1100	545	7.6	207	18	95	75	125	1.8	**2.16**	422	49	11	2.0	0.1	<0.1	0.08	1	10.5
04-Oct-23	4539	253	1500	372	7.5	331	18	89	36	127	1.8	**3.19**	395	209		0.9	0.1	<0.1	0.09	**2**	-9.1
08-Apr-24	4612	266	1250	451	7.22	233	10.5	90	55	115	1.6	**1.79**	600	154	20	0.8	<0.1	<0.1	0.03	**1.6**	-2.8
08-Jul-24	4640	188	963	268	7.71	173	8	85	13	107	1.7	**4.43**	410	68	16.6	0.7	<0.2	<0.2	0.08	0.8	10.9
01-Oct-24	4683	220	1060	399	7.57	187	13.6	78	50	99	1.8	**2.55**	356	52	20.8	3.2	<0.1	<0.1	0.07	**2**	11.2
TOTAL SAMPLES		114	113	112	114	112	96	96	96	95	95	114	89	109	112	115	114	115	114	113	
AVERAGE 2024		225	1091	373	7.50	198	10.7	84	39	107	1.7	2.923	455	91	19.1	1.6	<0.1	<0.1	0.06	1	

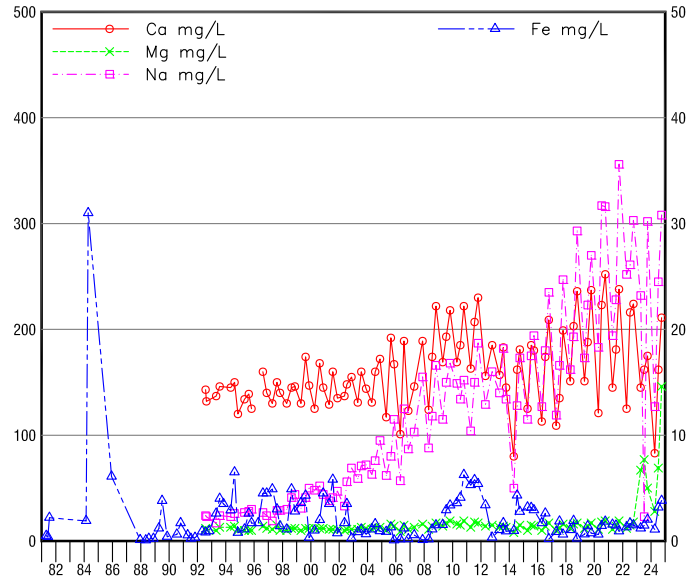
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**









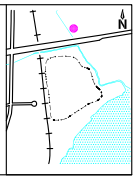


L Concentration Reported Less Than

G Concentration Reported Greater Than

A Concentration Determined Anomalous

Anomaly Not Plotted



CITY OF ORILLIA

KITCHENER STREET WASTE DIVERSION SITE

BH1-III

PEAT

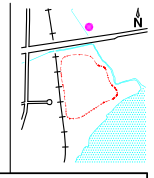
Screen 218.8 - 218.2 masl

22578520 24 Dec 24	wsp	24G002

BH1-III

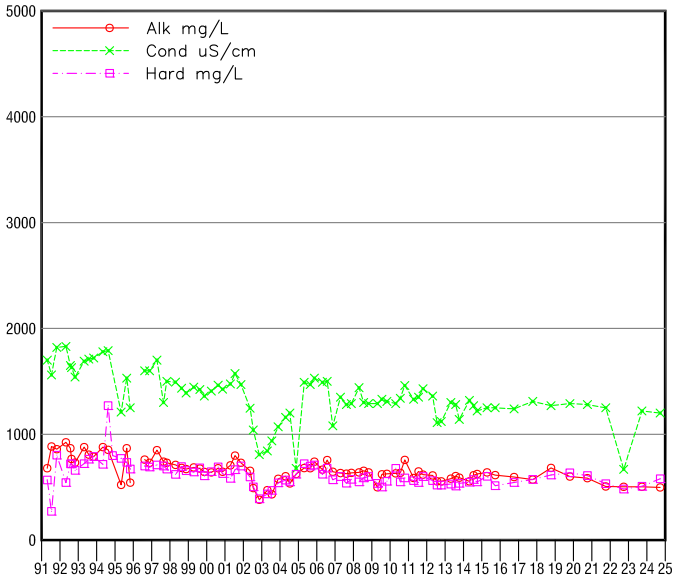
PEAT

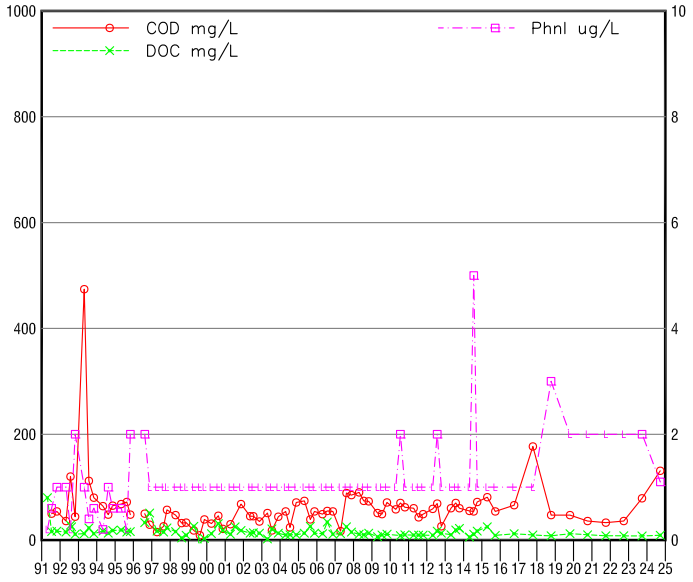
OBSERVATION WELL
Screen 218.8 - 218.2 masl

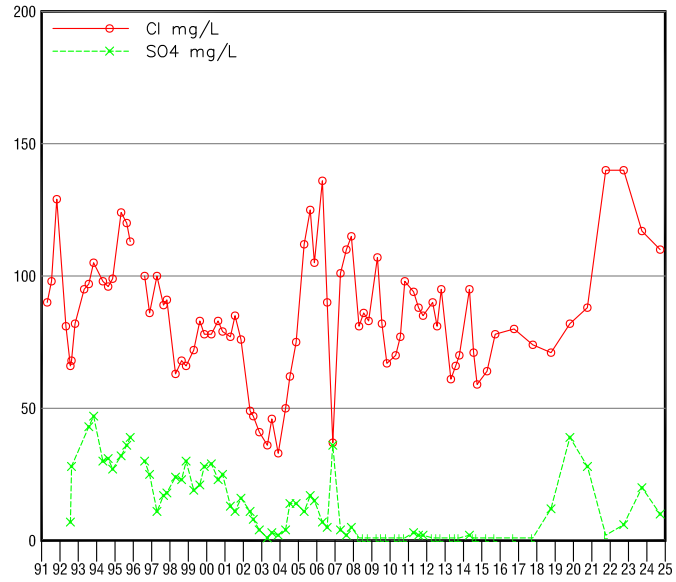


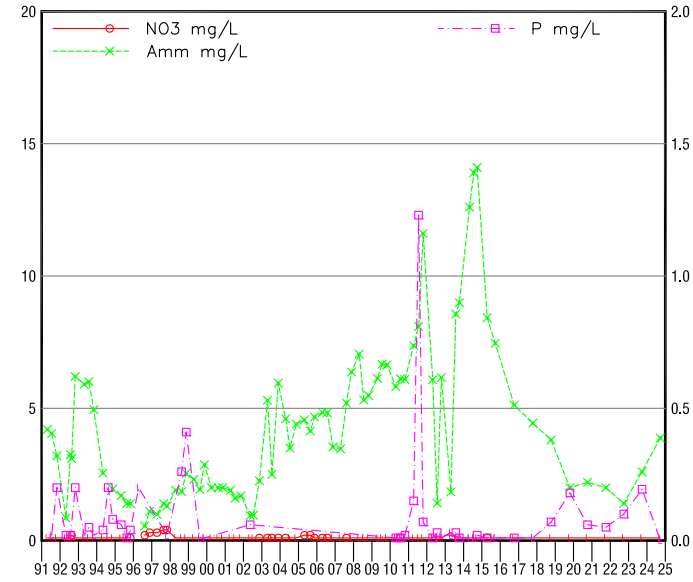
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
15-Apr-15	2973	280	1140	356	6.7	200	<1	125	10	115	0.7	**3.18**	411	422	45	1.8	0.1	<0.1	0.06	<1	4.1
20-Jul-15	3033	339	1630	524	7.1	329	<1	185	15	175	0.3	**3.14**	513	260	40	2.9	<0.1	<0.1	<0.01	<1	6.5
28-Sep-15	3092	317	1820	509	7.2	439	7	180	14	194	0.4	**2.91**	443	375	17	2.6	0.1	<0.1	0.05	<1	-0.5
19-Apr-16	3164	267	1160	323	7.3	217	2	113	10	127	0.3	**1.69**	360	295	23	1.8	<0.1	<0.1	<0.01	<1	2.7
17-Jul-16	3200	311	1740	493	7.3	396	4	174	14	180	0.3	**2.61**	399	477	16	2.7	0.2	<0.1	0.06	<1	0.8
17-Oct-16	3292	217	2000	591	7.7	505	41	209	17	235	0.3	0.197	375	811	15	1.9	0.1	<0.1	<0.01	<1	6.5
24-Apr-17	3327	165	1170	313	7.3	215	16	109	10	119	0.9	**0.864**	441	1524	20	2.6	0.1	0.2	0.3	<1	8.5
18-Jul-17	3393	264	1650	389	7.2	263	9	135	12	166	0.8	**1.86**	363	136	86	2.6	<0.1	<0.1	0.04	<1	7.7
17-Oct-17	3469	260	2290	564	7.4	511	36	199	16	247	<0.1	**0.613**	247	304	17	1.9	0.4	<0.1	0.06	<1	3.8
23-Apr-18	3520	225	1480	424	7.0	360	28	151	12	162	0.4	**1.04**	442	171	35	1.0	<0.1	<0.1	0.1	**5**	1.3
16-Jul-18	3573	301	1960	574	7.5	570	32	203	16	193	0.7	**1.91**	478	370	41	1.5	0.2	<0.1	0.2	**4**	-6.6
15-Oct-18	3646	191	2470	660	7.0	760	70	236	17	293	0.2	0.242	364	132	58	0.6	<0.1	<0.3	<0.1	**9**	-1.3
23-Apr-19	3698	221	1830	429	6.7	450	40	151	12	173	0.5	**0.637**	418	88	29	1.1	<0.1	<0.1	0.4	**6**	-5.4
15-Jul-19	3748	304	2070	525	6.7	580	<2	188	14	223	0.5	**1.40**	505	140	50	2.4	0.1	<0.1	0.2	**24**	-5.0
15-Oct-19	3824	241	2600	661	7.0	760	52	237	17	270	0.3	**0.737**	359	115	45	2.2	<0.1	<0.1	0.2	**7**	-4.4
14-Apr-20	3860	236	1590	349	6.9	400	<2	121	11	183	0.5	**0.617**	347	100	42	1.3	<0.1	<0.1	0.2	**3**	-3.3
08-Jul-20	3912	320	2640	630	7.1	720	<2	223	18	317	0.4	**1.44**	521	153	88	1.1	<0.1	<0.3	0.2	<2	-0.4
08-Oct-20	3968	294	2780	708	6.9	820	25	252	19	316	0.4	**1.84**	616	154	66	2.0	0.3	<0.3	0.2	**12**	-2.7
14-Apr-21	4040	244	1490	409	7.0	380	<2	145	11	194	0.5	**1.56**	369	121	36	1.5	<0.1	<0.3	0.2	<2	3.0
12-Jul-21	4094	299	2370	509	7.5	540	<20	181	14	228	<0.1	**1.46**	457	139	71	2.0	<0.1	<0.3	0.1	**4**	-2.5
29-Sep-21	4152	252	2910	671	7.8	730	<20	238	19	356	0.3	**0.919**	458	127	77	2.0	<0.1	<0.3	0.1	<2	6.0
11-Apr-22	4218	253	1760	362	7.3	470	<2	125	12	252	0.6	**1.30**	378	93	35	1.0	0.1	<0.1	0.2	<2	-0.1
11-Jul-22	4286	286	2600	600	7.2	670	<20	216	15	261	0.6	**1.67**	473	156	55	1.9	<0.1	<0.3	0.1	**2**	-2.5
04-Oct-22	4362	287	2720	634	6.7	690	<2	224	18	303	0.4	**1.49**	478	132	42	1.8	<0.1	<0.3	0.2	**13**	1.5
11-Apr-23	4414	231	1850	636	7.2	517	12	145	67	232	0.5	**1.20**	378	154	37	7.7	<0.1	0.6	0.1	**4**	8.1
10-Jul-23	4463	285	2390	722	7.3	618	2	162	77	23	0.6	**1.46**	473	355	50	6.0	<0.1	<0.1	0.1	**2**	2.2
04-Oct-23	4540	340	2460	644	7.3	647	4	175	50	302	1.6	**2.02**	476	325		2.8	<0.1	<0.1	0.1	**2**	-0.4
08-Apr-24	4613	237	1250	320	7.01	249	<0.5	83	28	127	1.0	**1.09**	273	169	34	1.3	<0.1	<0.1	0.26	**1.5**	-2.3
08-Jul-24	4641	351	1970	687	7.64	444	<2.5	162	69	245	1.4	**3.18**	452	257	61	1.8	<0.3	<0.3	0.11	1	4.9
01-Oct-24	4684	345	2540	1130	7.27	614	0.5	211	146	308	1.3	**3.81**	570	183	57.6	30	0.3	<0.1	0.37	1	19.7
TOTAL SAMPLES		112	110	110	112	113	96	94	94	93	93	113	88	108	110	113	112	113	113	112	
AVERAGE 2024		311	1920	712	7.31	436	<2.5	152	81	227	1.2	2.693	432	203	51	11	<0.3	<0.1	0.25	1.17	

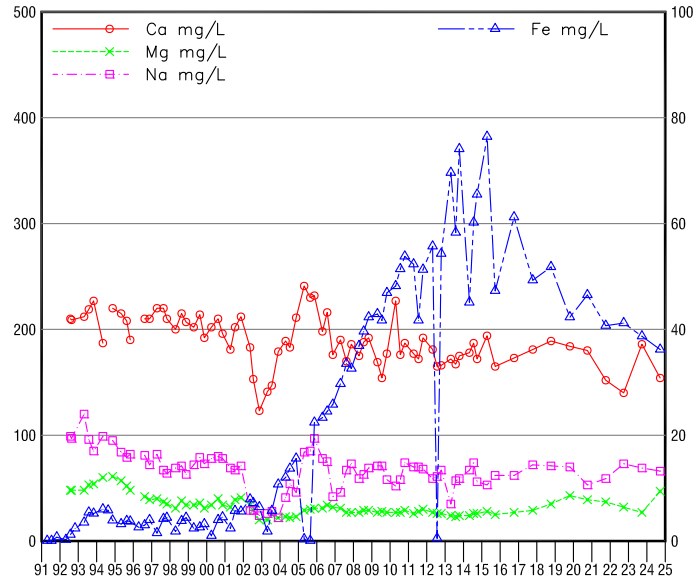
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**



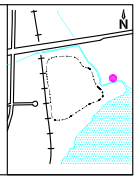








L	Concentration Reported Less Than
G	Concentration Reported Greater Than
A	Concentration Determined Anomalous
	Anomaly Not Plotted



CITY OF ORILLIA

KITCHENER STREET WASTE DIVERSION SITE

BH28-I

SAND AQUIFER

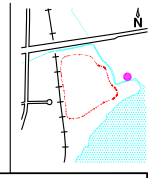
Screen 218.0 - 216.5 masl

22578520 24 Dec 24	wsp	24G031

BH28-I

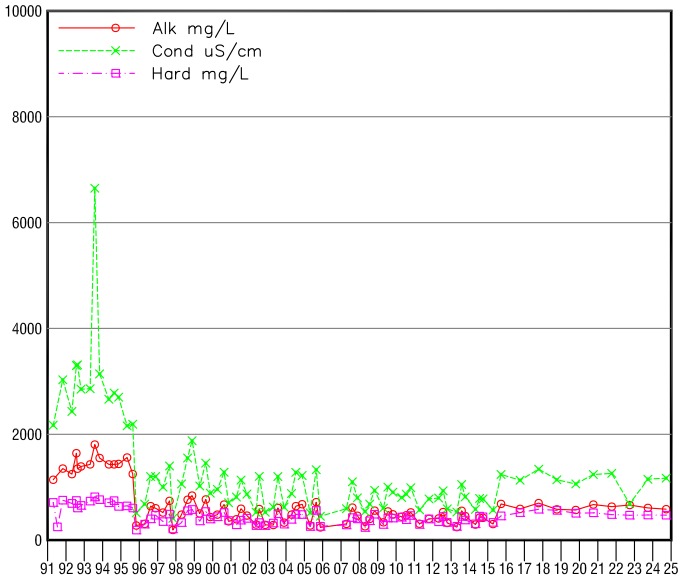
SAND AQUIFER

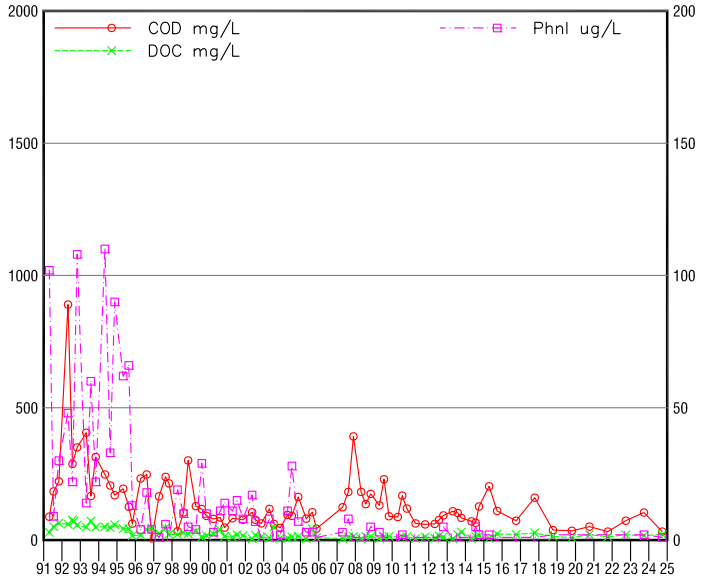
OBSERVATION WELL
Screen 218.0 - 216.5 masl

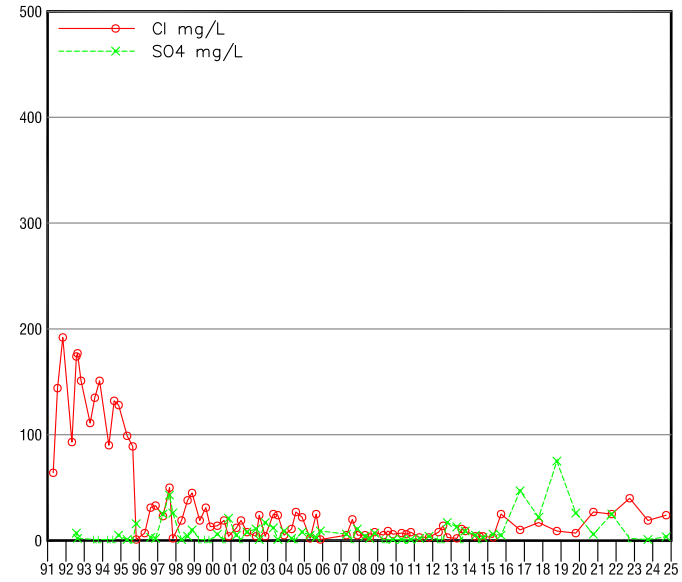


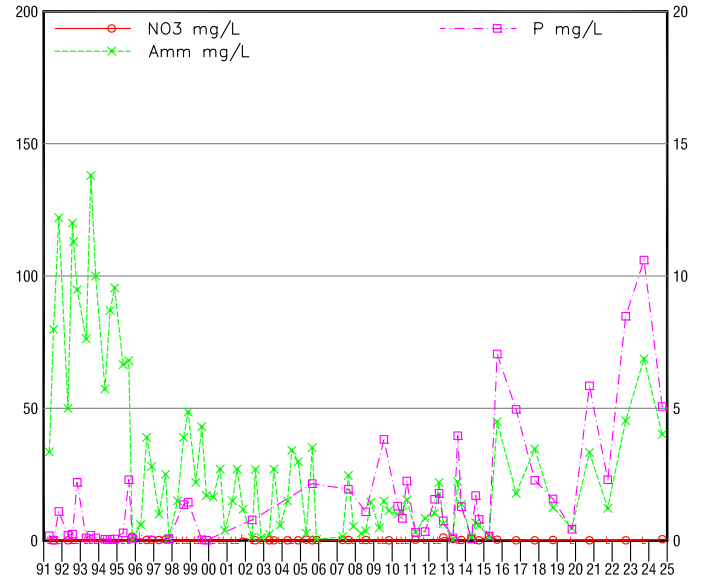
DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	PhnI ug/L	Ion B %
	PWQO											0.3								1	
31-Oct-08	810313	639	1290	600	6.7	83	<1	192	29	69	13	**42.3**	1900	73	13	6.3	<0.1	<0.1	5.48	<1	6.5
23-Apr-09	0911681	499	1290	535	6.4	107	<1	169	27	71	13	**42.9**	1620	51	6.2	7.3	<0.1	<0.1	6.13	<1	10.5
22-Jul-09	B09-2222	622	1330	501	6.8	82	<1	154	28	71	12	**41.7**	1550	49	9.6	7.8	<0.1	<0.1	6.67	<1	2.0
30-Oct-09	0934218	626	1310	556	6.8	67	<1	177	27	58	12	**46.9**	1860	71	11	7.3	<0.1	<0.1	6.64	<1	5.4
23-Apr-10	2033	630	1290	678	7.2	70	<1	227	27	52	12	**48.2**	1890	58		6.7	<0.1	<0.1	5.82	<1	11.3
23-Jul-10	2093	635	1340	550	7.3	77	<1	176	27	58	11	**51.4**	1680	70	8.3	6.9	0.1	<0.1	6.11	**2**	3.9
21-Oct-10	2138	758	1460	587	6.8	98	<1	187	29	74	12	**53.8**	1800	62	10	7.8	<0.1	<0.1	6.09	<1	−0.9
13-Apr-11	110887210	586	1330	562	7.8	94	3	177	26	70	14	**52.3**	1580	60	9.4	7.8	<0.1	<0.1	7.37	<1	7.5
21-Jul-11	111907215	648	1350	544	7.2	88	2	172	28	70	13	**41.7**	1570	43	9.4	11.6	<0.1	<0.1	8.09	<1	2.7
19-Oct-11	112837910	619	1430	600	7.1	85	2	192	30	68	14	**51.3**	1610	49	9.4	12.5	<0.1	<0.1	11.6	<1	9.8
27-Apr-12	120966310	611	1360	562	7.3	90	<1	181	27	59	13	**55.7**	1640	59	9.0	8.5	<0.1	<0.1	6.08	<1	5.9
25-Jul-12	2457	555	1110	519	7.9	81	<1	165	26	61	13	**0.51**	1730	69	17	7.5	<0.1	<0.1	1.41	**2**	0.4
16-Oct-12	2523	555	1120	520	7.9	95	<1	166	26	67	15	**54.3**	1650	26	13	7.7	<0.1	<0.1	6.16	<1	7.8
25-Apr-13	05955	581	1300	529	7.7	61	<1	172	24	35	15	**69.6**	2040	60	10	8.9	<0.3	<0.3	1.84	<1	6.2
31-Jul-13	132013216	604	1280	511	7.3	66	<1	167	23	57	13	**58.3**	1700	70	19	10.3	<0.1	<0.1	8.56	<1	6.1
10-Oct-13	132726210	589	1140	536	7.3	70	<1	175	24	59	14	**74.1**	1820	60	22	9.9	<0.1	<0.1	8.99	<1	10.4
30-Apr-14	140929010	555	1320	546	7.4	95	2	178	24	67	18	**45.1**	1810	55	5.7	13.8	<0.1	<0.1	12.6	<1	9.6
23-Jul-14	141869616	612	1270	572	7.3	71	<1	187	26	74	19	**60.2**	1660	54	11	15.2	<0.1	<0.1	13.9	**5**	12.6
29-Sep-14	142580410	624	1220	549	7.5	59	<1	172	26	56	18	**65.5**	1740	72	17	15.4	<0.1	<0.1	14.1	<1	9.1
17-Apr-15	2981	640	1250	602	6.8	64	<1	194	28	53	15	**76.4**	2080	81	25	10.3	0.1	<0.1	8.42	<1	10.5
24-Sep-15	3128	613	1250	514	7.3	78	<1	165	25	62	12	**47.3**	1810	54	8.7	8.0	<0.1	<0.1	7.46	<1	3.6
05-Oct-16	3273	596	1240	544	7.4	80	<1	173	27	62	11	**61.2**	1740	66	12	6.4	<0.1	<0.1	5.12	<1	7.3
12-Oct-17	3451	572	1310	573	7.5	74	<1	181	29	72	13	**49.3**	1900	177	9.5	6.1	<0.1	<0.1	4.44	<1	11.3
10-Oct-18	3617	682	1270	615	7.4	71	12	189	35	71	10	**51.8**	1820	47	8.0	3.7	<0.1	<0.1	3.8	**3**	5.6
21-Oct-19	3805	600	1290	636	7.1	82	39	184	43	70	6.5	**42.3**	1670	47	12	2.0	<0.1	<0.1	2.0	<2	7.6
05-Oct-20	4011	585	1280	609	7.7	88	28	180	39	53	6.8	**46.5**	1670	36	10	1.9	<0.1	<0.1	2.2	<2	5.5
05-Oct-21	4185	507	1250	533	7.4	140	<2	152	37	59	5.6	**40.7**	1520	33	8.0	2.3	<0.1	<0.1	2.0	<2	5.3
27-Sep-22	4343	504	668	482	7.0	140	6	140	32	73	4.4	**41.2**	1550	36	8.0	2.4	<0.1	<0.1	1.4	<2	1.1
26-Sep-23	4520	504	1220	508	7.0	117	20	186	27	69	5.9	**38.7**	1690	79	7.9	3.4	<0.1	<0.1	2.6	**2**	−3.9
23-Sep-24	4643	497	1200	579	6.84	110	10	154	47	66	7.6	**36.2**	1270	131	9.1	6	<0.1	<0.1	3.88	**1.1**	5.0
TOTAL SAMPLES		82	82	83	82	83	77	77	77	77	77	82	70	80	82	82	83	83	82	82	
AVERAGE 2024																					

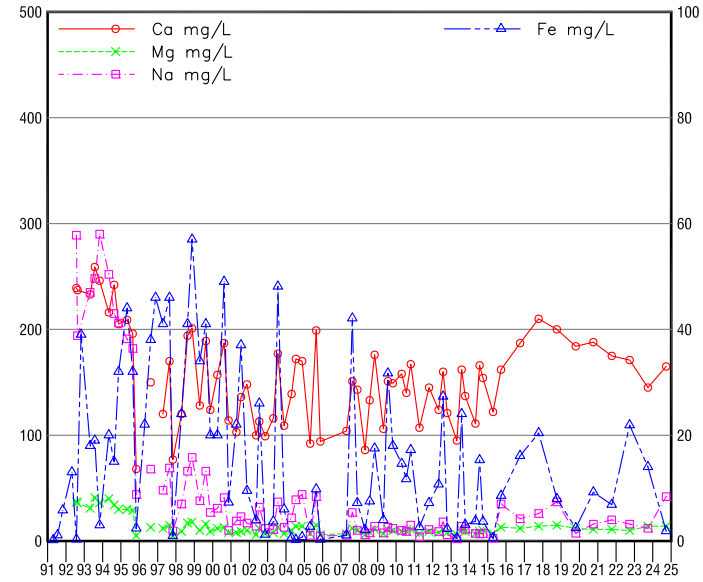
all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**









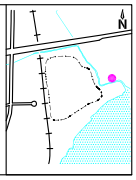


L Concentration Reported Less Than

G Concentration Reported Greater Than

A Concentration Determined Anomalous

Anomaly Not Plotted



CITY OF ORILLIA

KITCHENER STREET WASTE DIVERSION SITE

BH28-II

FILL

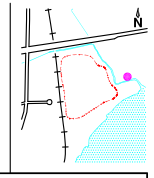
Screen 220.4 - 218.9 masl

22578520 24 Dec 24	wsp	24G032

BH28-II

FILL

OBSERVATION WELL
Screen 220.4 - 218.9 masl



DATE	SAMPLE #	Alk	Cond uS/cm	Hard	pH units	Cl	SO4	Ca	Mg	Na	K	Fe	Mn ug/L	COD	DOC	TKN	NO3	NO2	Amm	Phnl ug/L	Ion B %
	PWQO											0.3								1	
25-Jul-08	87253	400	680	364	7.3	3	2	133	8	7.6	6.9	**7.50**	139	136	13	7.1	0.2	0.1	3.65	<1	1.2
31-Oct-08	810313	555	940	488	6.8	8	7	176	11	14	9.5	**17.5**	210	175	14	18.2	<0.1	<0.1	14.5	**5**	3.1
23-Apr-09	0911682	335	601	294	6.6	5	<1	106	7	7.7	6.0	**3.96**	125	131	5.9	9.1	<0.1	<0.1	4.80	**3**	0.0
22-Jul-09	B09-239	540	1000	420	6.7	9	<1	151	11	13	9.5	**31.7**	229	230	12	19.8	<0.1	<0.1	14.9	<1	1.8
30-Oct-09	0934211	487	903	415	7.3	6	1	149	10	12	8.8	**18.0**	205	90	13	15.5	0.1	<0.1	11.3	<1	2.6
23-Apr-10	2034	441	803	432	7.2	7	1	158	9	10	7.7	**14.6**	156	87		12.8	<0.1	<0.1	9.93	<1	7.5
23-Jul-10	2094	468	868	386	7.2	6	<1	140	9	9.0	7.6	**11.7**	297	168	12	11.9	<0.1	<0.1	10.7	**2**	−0.1
21-Oct-10	2139	523	989	465	6.8	8	1	167	11	15	10	**17.2**	261	119	13	20.0	<0.1	<0.1	15.4	<1	5.2
13-Apr-11	110887211	309	570	296	7.9	3	2	107	7	4.0	2.5	**2.64**	66	63	5.8	4.8	0.3	<0.1	3.12	<1	1.2
19-Oct-11	112837911	402	778	399	7.0	3	4	145	9	11	6.9	**7.19**	109	59	12	8.8	<0.1	<0.1	8.42	<1	7.3
27-Apr-12	120966311	407	795	345	7.5	8	<1	124	8	9.0	6.5	**10.7**	151	61	7.0	13.7	<0.1	<0.1	10.3	<1	1.0
25-Jul-12	2458	529	932	444	7.9	14	<1	160	11	18	11	**27.3**	289	76	16	21.3	<0.1	<0.1	21.9	<1	6.5
16-Oct-12	2524	324	590	333	7.7	3	17	121	8	6.0	4.9	**2.31**	118	93	12	7.4	1.2	0.4	6.39	**5**	4.3
25-Apr-13	06033	245	530	260	7.9	2	13	95	6	2.0	2.9	**0.52**	95	109	5.0	2.8	0.6	0.1	0.31	<1	1.6
31-Jul-13	132013217	554	1050	446	7.3	11	<1	162	10	14	9.4	**24.0**	332	102	20	23.0	<0.1	<0.1	22.2	<1	3.5
10-Oct-13	132726211	453	817	380	7.6	9	9	137	9	11	7.0	**3.08**	127	84	30	15.0	0.2	<0.1	13.7	<1	−1.0
30-Apr-14	140929011	292	581	306	7.5	4	5	111	7	7.2	5.2	**3.76**	234	71	5.4	1.9	0.6	<0.1	1.27	<1	5.3
23-Jul-14	141869617	424	786	451	7.3	4	<1	166	9	6.8	7.7	**15.3**	309	65	13	8.9	<0.1	<0.1	6.69	**5**	10.3
29-Sep-14	142580411	420	776	439	7.5	4	3	154	10	7.1	8.0	**3.66**	383	127	16	6.2	0.1	<0.1	5.62	**2**	5.3
17-Apr-15	2982	301	567	333	7.1	3	6	122	7	2.6	2.3	**0.53**	57	203	7.0	2.1	1.8	<0.1	1.39	**2**	4.5
24-Sep-15	3129	682	1240	456	7.7	25	5	162	13	35	16	**8.56**	294	110	23	53.0	0.3	<0.1	44.9	<1	0.5
05-Oct-16	3274	589	1130	518	7.4	10	47	187	12	21	13	**16.1**	326	73	21	33.0	0.1	<0.1	17.9	<1	1.4
12-Oct-17	3452	698	1340	583	7.6	17	22	210	14	26	15	**20.4**	566	160	27	39.6	0.1	<0.1	34.6	<1	4.7
10-Oct-18	3618	581	1140	562	7.5	9	75	200	15	37	18	**7.96**	429	38	14	17.2	0.2	<0.1	12.5	<2	3.7
21-Oct-19	3806	567	1060	508	7.0	7	26	184	12	7.3	11	**2.44**	137	35	9.0	4.9	<0.1	<0.1	4.7	<2	−3.8
05-Oct-20	4012	672	1240	515	7.8	27	6	188	11	16	14	**9.22**	478	51	21	39.5	0.1	<0.1	33.3	<2	−0.9
05-Oct-21	4186	632	1260	482	7.6	25	25	175	11	20	14	**6.87**	337	32	12	14.4	<0.1	<0.1	12.2	<2	−10.2
27-Sep-22	4344	661	686	469	7.0	40	<2	171	10	16	11	**21.9**	444	73	20	48.4	0.1	<0.1	45.3	<2	0.1
26-Sep-23	4521	608	1150	474	7.2	19	1	145	14	12	10	**14.0**	466	104	17	48.7	<0.1	0.2	68.7	**2**	−3.9
23-Sep-24	4644	584	1170	470	6.94	23.9	3.6	165	14	42	20	**1.87**	305	32	21.1	36	0.5	<0.2	40.2	1	6.8
TOTAL SAMPLES		79	79	80	79	80	73	73	73	73	73	79	67	78	79	79	80	79	80	79	
AVERAGE 2024																					

all Concentrations mg/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

Water Quality Graphs and Data - Metals Parameters

OW1-I

SAND AQUIFER

OBSERVATION WELL
Screen 211.5 - 206.9 masl

FORMERLY OW1-IX
CONVERTED Sep 16

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
12-Oct-10	2114			2010	**2100**	0.02	<2	<2	0.04	2.7	**0.03**	<0.01	<1	<0.02	40	<5		<10	<5	
09-Nov-10	2179			2150		<0.02	<2	<2	<0.02		**0.04**	<0.01	<1	<0.02	50	<5		<10	<5	
27-Oct-11	2356	<0.1		2290		<0.02	<2	2	<0.02	0.7	**1.31**	<0.01	1	<0.02	50	<5		<10	**21**	
12-Oct-12	2550			1960		<0.1	4	<2	<1		**0.04**		<4	<0.1	4	**4.1**		<3	<5	
21-Oct-13	2731			2200		<0.02	<2	<2	0.05		**0.04**		5	<0.02	50	**6**		<10	7	
14-Oct-14	2923			2070		<0.02	<2	<2	<0.02		**0.03**		3	<0.02	50	**3.8**		<10	**32**	
22-Sep-15	3130			1920		<0.02	<2	<2	0.06		**0.03**	<0.01	2	<0.02	50	**3.5**		<10	<5	978
06-Oct-16	3275			1450		<0.02	2	3	<0.02		**0.65**	<0.01	<1	<0.02	**620**	0.8		<10	8	1080
10-Oct-17	3453			2120		0.106	<2	<2	<0.02		<0.01	<0.01	<1	<0.02	**110**	**8**		<10	<5	896
09-Oct-18	3619			2090		0.049	0.87	2.78	0.08		**0.22**		0.28	<0.05	12	**11.9**		8.4	6	
23-Oct-19	3807			2110		0.01	0.82	1.2	0.09		**0.32**		0.22	<0.05	5	**11.5**		9	3	
05-Oct-20	4013			2090		0.024	0.92	1.1	0.05		**0.17**		0.21	<0.05	5	**13.1**		9.9	4	
05-Oct-21	4187			2100		0.015	1.09	1.4	<0.09		**0.36**		0.23	<0.05	9	**11.5**		8.6	3	
27-Sep-22	4345			2030		0.017	1.08	1.1	<0.09		**0.08**		0.14	<0.05	5	**12.7**		10.2	3	
27-Sep-23	4522			2220		0.046	4.5	1.9	<0.05		**0.176**	0.033	2.49	<0.01	8	**13.3**		14.5	2	
24-Sep-24	4645			2130		0.032	9.5	2.3	0.1		**0.084**	0.005	1.7	0.01	5	**11.7**		11.3	8	
TOTAL SAMPLES		1	0	16	1	16	16	16	16	2	16	8	16	16	16	16	0	16	16	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW1-II

SAND AQUIFER

OBSERVATION WELL
Screen 215.6 - 214.1 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
12-Oct-10	2115			2260	**1610**	<0.02	<2	<2	0.04	1	0.02	<0.01	<1	<0.02	40	<5		<10	8	
09-Nov-10	2180										**0.03**	<0.01								
26-Oct-11	2357	<0.1		2220		<0.02	<2	<2	<0.02	0.6	**0.14**	<0.01	1	<0.02	40	<5		10	11	
12-Oct-12	2551			2100		<0.1	4	<2	<1		<0.02		<4	<0.1	5	**14.5**		7	<5	
21-Oct-13	2732			2430		<0.02	<2	<2	0.05		0.02		3	<0.02	60	**20**		<10	6	
14-Oct-14	2924			2270		<0.02	<2	<2	<0.02		<0.01		2	<0.02	40	**11.9**		<10	6	
22-Sep-15	3131			1970		<0.02	<2	<2	0.05		0.01	<0.01	1	<0.02	50	**11.7**		<10	<5	896
06-Oct-16	3276			1940		0.06	<2	<2	0.45		0.01	<0.01	2	<0.02	40	**12.4**		<10	<5	888
10-Oct-17	3504			2260		<0.014	<2	<2	<0.02		0.02	<0.01	<1	<0.02	**80**	**16**		<10	<5	838
09-Oct-18	3620			1970		<0.003	0.92	0.45	<0.01		**0.08**		0.19	<0.05	3	**16.4**		9.5	2	
22-Oct-19	3808			2120		<0.003	0.83	1.3	0.09		**0.06**		0.21	<0.05	2	**16.2**		8.8	3	
05-Oct-20	4014			1850		0.015	0.96	<0.2	0.04		**0.04**		0.19	<0.05	2	**17.2**		9.5	3	
05-Oct-21	4188			2170		0.005	1.06	1.2	<0.09		<0.03		0.24	<0.05	2	**16.6**		9.8	3	
27-Sep-22	4346			1860		0.006	1.01	1.1	<0.09		**0.03**		0.15	<0.05	2	**18.1**		9.3	2	
27-Sep-23	4523			1880		0.06	11.9	1.3	<0.05		**0.033**	0.037	1.92	<0.01	4	**22.2**		14.8	<1	
24-Sep-24	4646			1720		0.041	7.6	2.1	0.13		0.007	<0.005	1.27	0.01	3	**16.6**		10.4	6	
TOTAL SAMPLES		1	0	15	1	15	15	15	15	2	16	8	15	15	15	15	0	15	15	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW1-III

PEAT

OBSERVATION WELL
Screen 219.3 - 218.1 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
12-Oct-10	2116			520	**454**	<0.02	<2	<2	0.03	1.5	**0.15**	0.11	<1	<0.02	40	<5		<10	<5	
09-Nov-10	2181										**0.30**	<0.01								
26-Oct-11	2358	<0.1		413		0.02	<2	<2	<0.02	<0.1	**0.86**	<0.01	2	<0.02	50	<5		<10	<5	
12-Oct-12	2552			454		<0.1	3	<2	<1		**0.23**		<4	<0.1	11	**1**		<3	10	
21-Oct-13	2733			557		<0.02	<2	<2	0.04		**0.30**		2	<0.02	70	<5		<10	<5	
14-Oct-14	2925			377		<0.02	<2	<2	<0.02		**0.55**		1	<0.02	70	0.7		<10	<5	
22-Sep-15	3132			475		<0.02	<2	<2	0.04		**0.37**	<0.01	<1	<0.02	50	0.7		<10	<5	861
06-Oct-16	3277			416		<0.02	<2	<2	<0.02		**0.52**	<0.01	1	<0.02	50	**10.4**		<10	<5	780
10-Oct-17	3454			749		<0.014	<2	<2	0.09		**0.20**	<0.01	<1	<0.02	**100**	<5		<10	5	860
09-Oct-18	3621			518		0.005	0.36	1.59	0.08		**0.70**		0.14	<0.05	7	**1.86**		1.4	4	
22-Oct-19	3809			364		0.003	0.23	1	0.08		**0.81**		0.13	<0.05	7	**1.22**		0.7	3	
05-Oct-20	4015			295		0.071	0.31	0.5	0.04		**0.66**		0.1	<0.05	7	**1.27**		0.9	<2	
05-Oct-21	4189			313		0.004	0.34	0.6	<0.09		**0.96**		0.13	<0.05	7	0.611		0.5	<2	
27-Sep-22	4347			329		0.003	0.33	0.4	<0.09		**0.54**		0.09	<0.05	9	0.74		0.8	<2	
27-Sep-23	4524			283		0.015	2.8	0.7	<0.05		**0.962**	0.039	0.61	<0.01	11	**1**		6.8	<1	
24-Sep-24	4647			508		<0.005	7.5	1.8	0.08		**1.29**	0.033	1.61	<0.01	4	**1.4**		3.6	7	
TOTAL SAMPLES		1	0	15	1	15	15	15	15	2	16	8	15	15	15	15	0	15	15	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW2-I

SAND AQUIFER

OBSERVATION WELL
Screen 212.6 - 210.1 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
13-Oct-10	2117			2620	**4710**	0.05	<2	<2	0.1	1.3	0.02	<0.01	<1	<0.02	50	<5		20	<5	
09-Nov-10	2182			2910		0.07	<2	<2	0.08		**0.03**	<0.01	2	<0.02	60	<5		10	8	
27-Oct-11	2359	0.2		2970		<0.02	<2	<2	0.05	0.2	**2.58**	<0.01	5	0.03	60	<5		20	7	
12-Oct-12	2565			3020		<0.1	9	<2	<1		<0.02		6	<0.1	5	**3.1**		14	7	
21-Oct-13	2734			2890		<0.02	<2	<2	0.1		**0.03**		14	0.02	60	<5		10	<5	
14-Oct-14	2926			2800		<0.02	<2	<2	0.02		0.02		<10	0.02	60	**2**		<10	<5	
22-Sep-15	3133			2520		<0.02	<2	<2	0.05		0.02	<0.01	5	0.02	60	**2.1**		<10	6	1580
03-Oct-16	3278			2550		<0.02	<2	<2	<0.02		**0.03**	<0.01	1	<0.02	60	0.6		10	<5	1560
10-Oct-17	3455			2950		<0.014	<2	<2	0.22		0.02	<0.01	<1	0.03	**110**	<5		10	<5	1501
09-Oct-18	3622			2480		0.006	0.41	1.36	0.08		**0.05**		0.32	<0.05	2	**2.13**		11.6	4	
22-Oct-19	3810			2380		0.005	0.28	1	0.23		**0.38**		0.3	<0.05	2	**1.94**		10.9	7	
05-Oct-20	4016			2070		0.007	0.36	0.6	0.06		**0.82**		0.26	<0.05	8	**2.03**		10.8	4	
05-Oct-21	4190			2450		0.003	0.43	1.3	<0.09		**0.96**		0.28	<0.05	6	**1.82**		10.4	3	
28-Sep-22	4348			2110		0.004	0.41	0.8	<0.09		**0.09**		0.36	<0.05	2	**1.91**		9.8	3	
26-Sep-23	4525			2200		0.013	24.7	3.4	<0.05		**1.58**	0.017	4.61	<0.01	2	**2.5**		18	1	
24-Sep-24	4648			1920		0.027	13.1	3.8	0.07		**0.722**	<0.005	3.62	<0.01	1	**2**		12.4	8	
TOTAL SAMPLES		1	0	16	1	16	16	16	16	2	16	8	16	16	16	16	0	16	16	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW2-II

SAND AQUIFER

OBSERVATION WELL
Screen 217.8 - 213.2 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
13-Oct-10	2118			1830	**4210**	0.07	<2	**8**	<0.02	0.8	0.02	<0.01	2	0.1	50	**10**		<10	6	
09-Nov-10	2183			1910		0.13	<2	**11**	0.05		0.02	<0.01	1	<0.02	60	**7**		<10	6	
27-Oct-11	2360	0.2		2080		0.03	<2	**12**	0.08	0.4	**0.15**	<0.01	2	<0.02	50	<5		20	9	
12-Oct-12	2553			2350		<0.1	6	**16**	<1		<0.02		<4	<0.1	8	**14.9**		13	8	
21-Oct-13	2735			2050		0.03	<2	**12**	0.14		0.02		8	<0.02	60	**15**		<10	5	
15-Oct-14	2927			1920		0.03	<2	**9**	0.1		0.01		5	<0.02	50	**10.8**		<10	<5	
22-Sep-15	3134			1900		<0.02	<2	**6**	0.04		<0.01	<0.01	2	<0.02	50	**10.5**		<10	<5	1110
03-Oct-16	3279			1690		<0.02	<2	4	<0.02		0.01	<0.01	5	0.04	50	**1.8**		<10	<5	1070
10-Oct-17	3456			2070		0.17	<2	<2	<0.02		<0.01	<0.01	<1	<0.02	**100**	**11**		10	<5	1043
09-Oct-18	3623			1830		0.012	0.79	4.66	0.07		**0.76**		0.26	<0.05	3	**13**		7.1	5	
22-Oct-19	3811			2040		0.162	0.86	**86.7**	0.29		**0.05**		0.28	<0.05	19	**13.4**		8.5	8	
05-Oct-20	4017			1750		0.283	1.61	2.1	0.03		**0.14**		0.25	<0.05	4	**13.3**		7.9	3	
05-Oct-21	4191			2020		0.016	1.2	2.6	<0.09		**0.50**		0.25	<0.05	5	**13.7**		9.2	5	
28-Sep-22	4349			2020		0.008	1.21	2.5	<0.09		**0.05**		0.17	<0.05	4	**15.1**		11.4	3	
27-Sep-23	4526			2250		0.065	14.9	2.5	<0.05		**0.093**	0.014	1.5	<0.01	7	**17.3**		19	2	
24-Sep-24	4649			1900		0.066	10.1	3	0.15		**0.041**	<0.005	1.75	0.01	5	**14.9**		16.3	6	
TOTAL SAMPLES		1	0	16	1	16	16	16	16	2	16	8	16	16	16	16	0	16	16	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW3

WASTE

OBSERVATION WELL
Screen 221.5 - 218.7 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
13-Oct-10	2119	1.1	**24.8**	416	**1260**	0.12	<2	<2	0.51	4.9	**0.05**	0.08	<1	<0.02	60	<5	<0.02	20	7	
09-Nov-10	2184			551		0.08	<2	<2	0.08		0.02	<0.01	<1	<0.02	60	<5		<10	7	
27-Oct-11	2361	<0.1		360		0.04	<2	<2	0.05	0.3	**0.52**	0.01	<1	<0.02	50	<5		<10	7	
12-Oct-12	2554			584		<0.1	5	<2	<1		<0.02		<4	<0.1	7	**2.6**		6	5	
21-Oct-13	2736			518		<0.02	<2	<2	0.11		**0.14**		<1	<0.02	70	<5		<10	7	
14-Oct-14	2928			490		<0.02	<2	<2	0.02		**0.07**		<1	<0.02	50	**1.1**		<10	10	
21-Sep-15	3135			512		0.03	2	<2	0.06		**0.23**	0.02	<1	<0.02	50	**1.6**		<10	5	691
03-Oct-16	3280			525		<0.02	3	<2	<0.02		**0.26**	<0.01	2	<0.02	50	**8.8**		<10	<5	715
10-Oct-17	3457			579		<0.014	<2	<2	0.03		**0.27**	<0.01	<1	<0.02	**110**	<5		<10	<5	573
10-Oct-18	3624			438		0.003	1.54	0.64	0.05		**0.53**		0.11	<0.05	6	**1.07**		4.7	4	
21-Oct-19	3812			323		0.01	0.92	1.1	0.19		**8.71**		0.11	<0.05	14	0.669		5.3	8	
05-Oct-20	4018			265		0.005	1.82	2	0.12		**2.47**		0.12	<0.05	5	**1.18**		5.9	3	
04-Oct-21	4192			195		0.041	0.58	1.9	0.84		**0.17**		0.08	<0.05	65	0.486		11.6	4	
27-Sep-22	4350			403		0.031	2.27	0.7	0.15		**0.95**		0.14	<0.05	6	**1.96**		9.3	<2	
27-Sep-23	4527			303		0.039	9.8	0.9	0.14		**0.914**	0.006	0.56	<0.01	11	**2.1**		8.8	1	
23-Sep-24	4650			281		0.049	7.7	1.5	0.33		**0.489**	<0.005	0.45	<0.01	6	**1.4**		3.9	6	
TOTAL SAMPLES		2	1	16	1	16	16	16	16	2	16	8	16	16	16	16	1	16	16	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW4-I

SAND AQUIFER

OBSERVATION WELL
Screen 214.7 - 212.6 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
14-Oct-10	2120			1640	**2180**	0.1	<2	<2	0.07	0.8	0.02	<0.01	<1	<0.02	40	<5		<10	7	
10-Nov-10	2185			1770		0.08	<2	<2	0.09		0.02	<0.01	<1	<0.02	50	<5		<10	9	
28-Oct-11	2362	<0.1		1750		<0.02	<2	<2	0.05	0.3	**3.43**	<0.01	<1	<0.02	50	<5		<10	14	
12-Oct-12	2555			1790		<0.1	3	<2	<1		<0.02		<4	<0.1	7	**2.6**		<3	5	
21-Oct-13	2737			1750		<0.02	<2	<2	0.02		**0.04**		2	<0.02	70	<5		<10	5	
15-Oct-14	2929			1760		<0.02	<2	<2	0.02		<0.01		1	<0.02	50	**1.6**		<10	9	
23-Sep-15	3136			1700		<0.02	<2	<2	0.03		0.02	<0.01	<1	<0.02	50	**1.6**		<10	<5	667
04-Oct-16	3281			1710		0.09	<2	<2	<0.02		0.02	<0.01	<1	<0.02	50	**1.1**		<10	<5	675
11-Oct-17	3458			1900		<0.014	<2	<2	0.02		**0.03**	<0.01	<1	<0.02	**110**	**7**		<10	<5	603
10-Oct-18	3625			1630		<0.003	0.78	2.52	0.14		**1.68**		0.09	<0.05	4	**2.12**		1.3	6	
23-Oct-19	3813			1560		<0.003	0.66	0.8	0.15		**2.53**		0.08	<0.05	64	**1.85**		1.2	4	
02-Oct-20	4019			1580		0.029	2.63	2.3	1.14		**5.79**		0.09	<0.05	**783**	**2.33**		2.4	9	
05-Oct-21	4193			1560		0.008	0.87	0.9	<0.09		**1.23**		0.08	<0.05	17	**1.83**		1.2	5	
28-Sep-22	4351			1720		0.012	0.77	0.6	0.1		**0.06**		0.06	<0.05	7	**1.82**		0.9	<2	
26-Sep-23	4528			1680		0.039	9.9	2.9	0.31		**22.7**	0.076	0.56	<0.01	6	**2.7**		8	3	
23-Sep-24	4651			1570		0.038	8.3	1.1	0.15		**0.45**	0.006	0.49	<0.01	3	**1.9**		3.2	8	
TOTAL SAMPLES		1	0	16	1	16	16	16	16	2	16	8	16	16	16	16	0	16	16	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW4-II

UPPER SAND / SILTY SAND

OBSERVATION WELL
Screen 219.0 - 217.5 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
14-Oct-10	2121			62	107	0.06	<2	<2	0.09	0.2	**0.45**	0.26	<1	<0.02	50	<5		<10	<5	
10-Nov-10	2186										**0.56**	0.14								
28-Oct-11	2363	<0.1		47		<0.02	<2	<2	<0.02	<0.1	**0.81**	0.35	<1	<0.02	70	<5		<10	6	
12-Oct-12	2556			41		<0.1	<3	<2	<1		**0.34**		<4	<0.1	29	<0.5		<3	10	
21-Oct-13	2738			40		<0.02	<2	<2	<0.02		**0.40**		<1	<0.02	70	<5		<10	<5	
15-Oct-14	2930			37		<0.02	<2	<2	<0.02		**0.57**		<1	<0.02	50	<0.1		<10	<5	
23-Sep-15	3137			47		<0.02	<2	<2	<0.02		**0.44**	0.16	<1	<0.02	60	0.2		<10	<5	471
04-Oct-16	3282			38		<0.02	<2	<2	<0.02		**0.35**	0.16	<1	<0.02	50	**1.3**		<10	<5	349
11-Oct-17	3459			40		<0.014	<2	<2	<0.02		**0.39**	0.18	<1	<0.02	**80**	<5		<10	<5	286
10-Oct-18	3626			41.8		<0.003	0.33	0.69	0.07		**0.46**		0.16	<0.05	44	0.092		0.3	3	
23-Oct-19	3814			43.9		0.008	0.18	0.7	0.06		**0.59**		0.06	<0.05	18	0.069		0.1	2	
02-Oct-20	4020			36.7		0.064	0.77	1.3	0.1		**0.55**		0.1	<0.05	21	0.07		0.2	4	
05-Oct-21	4194			36.7		0.045	0.34	0.7	<0.09		**0.52**		0.05	<0.05	23	0.051		0.2	2	
28-Sep-22	4352			44.2		0.043	0.29	0.5	<0.09		**0.35**		0.1	<0.05	16	0.106		0.4	<2	
26-Sep-23	4529			48.1		0.031	3.6	0.3	<0.05		**0.799**	0.089	0.18	<0.01	32	0.3		3.5	<1	
23-Sep-24	4652			33.3		0.021	3.8	0.8	0.12		**0.135**	0.061	<0.05	<0.01	19	0.2		0.8	5	
TOTAL SAMPLES		1	0	15	1	15	15	15	15	2	16	8	15	15	15	15	0	15	15	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW5-I

SAND AQUIFER

OBSERVATION WELL
Screen 210.0 - 208.4 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
14-Oct-10	2122	<0.1	1.7	847	**535**	<0.02	<2	<2	0.07	0.1	<0.01	<0.01	<1	<0.02	40	<5	<0.02	<10	<5	
10-Nov-10	2187			872		<0.02	<2	<2	0.04		0.01	<0.01	<1	<0.02	50	<5		<10	<5	
28-Oct-11	2364	<0.1		816		<0.02	<2	<2	0.04	<0.1	**0.43**	<0.01	<1	<0.02	50	<5		<10	9	
12-Oct-12	2557			793		0.3	4	<2	<1		<0.02		<4	<0.1	5	**7**		6	<5	
21-Oct-13	2739			918		<0.02	<2	<2	0.14		<0.01		2	<0.02	60	**8**		<10	<5	
14-Oct-14	2931			1030		<0.02	<2	<2	0.08		<0.01		3	<0.02	50	**6**		<10	<5	
23-Sep-15	3138			952		0.02	<2	<2	0.05		<0.01	<0.01	<1	<0.02	50	**6**		<10	<5	892
04-Oct-16	3283			1010		<0.02	<2	<2	<0.02		<0.01	<0.01	<1	<0.02	50	<0.1		<10	10	931
11-Oct-17	3460			1350		<0.014	<2	<2	0.19		<0.01	<0.01	<1	<0.02	**110**	**10**		<10	5	923
10-Oct-18	3627			1200		0.011	0.39	2.03	0.1		**0.54**		0.11	<0.05	2	**7.51**		6.1	5	
23-Oct-19	3815			1780		0.016	0.35	1.5	0.11		**0.38**		0.16	<0.05	4	**7.83**		8.1	4	
02-Oct-20	4021			1180		0.081	0.3	0.6	0.06		**0.25**		0.11	<0.05	2	**6.62**		5.8	4	
28-Sep-22	4397			1330		0.014	0.37	1.1	<0.09		**0.20**		0.11	<0.05	4	**6.42**		5.9	2	
25-Sep-23	4530			1940		0.06	17.9	1.8	<0.05		**0.358**	0.022	3.8	<0.01	3	**8.6**		17.1	<1	
23-Sep-24	4653			1340		0.026	8.3	3.2	0.23		**0.665**	0.008	1.69	0.01	2	**6.7**		9.2	9	
TOTAL SAMPLES		2	1	15	1	15	15	15	15	2	15	8	15	15	15	15	1	15	15	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW6-I

SAND AQUIFER

OBSERVATION WELL
Screen 217.1 - 214.1 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
14-Oct-10	2124	<0.1	**7.9**	1780	**2960**	0.04	3	3	0.05	1.2	0.02	0.02	<1	0.03	50	<5	<0.02	20	8	
09-Nov-10	2189			1870		0.13	2	3	0.04		0.02	<0.01	<1	0.04	60	<5		<10	7	
28-Oct-11	2366	<0.1		1700		<0.02	4	3	0.03	0.4	**2.45**	<0.01	<1	0.03	50	<5		20	12	
12-Oct-12	2559			1440		<0.1	5	<2	<1		**0.04**		<4	<0.1	12	**14.1**		11	<5	
22-Oct-13	2741			1520		0.04	3	<2	0.02		0.02		2	0.03	60	**18**		10	9	
15-Oct-14	2933			1480		0.02	2	3	0.05		0.01		2	0.03	50	**12.4**		<10	**54**	
24-Sep-15	3140			1310		<0.02	3	<2	<0.02		0.02	<0.01	1	0.04	50	**12.5**		10	<5	903
04-Oct-16	3285			1270		<0.02	3	<2	<0.02		**0.04**	<0.01	3	<0.02	50	**5.3**		10	<5	906
11-Oct-17	3462			1410		<0.014	<2	<2	0.16		<0.01	<0.01	<1	0.03	**100**	**16**		10	<5	872
10-Oct-18	3629			1180		0.011	2.39	2.4	0.12		**0.82**		0.26	<0.05	10	**15.9**		12.7	7	
23-Oct-19	3817			1150		0.011	2.43	0.3	0.03		**0.76**		0.23	<0.05	13	**15.2**		13.9	3	
02-Oct-20	4023			1010		0.010	3.20	1.7	0.03		**1.41**		0.18	<0.05	10	**14.7**		13.1	6	
04-Oct-21	4195			1020		0.011	2.99	1.2	<0.09		**1.67**		0.16	<0.05	28	**15**		13.6	2	
29-Sep-22	4353			1150		0.027	2.21	1.4	0.09		**0.71**		0.09	<0.05	10	**15.6**		12.5	2	
26-Sep-23	4531			1040		0.181	15.1	1.1	<0.05		**5.52**	0.029	0.87	<0.01	14	**17.8**		18.3	<1	
24-Sep-24	4654			894		0.139	9.5	1.3	0.11		**1.17**	<0.005	0.71	0.02	7	**13.9**		15.4	5	
TOTAL SAMPLES		2	1	16	1	16	16	16	16	2	16	8	16	16	16	16	1	16	16	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW6-II

WASTE

OBSERVATION WELL
Screen 219.9 - 217.4 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
13-Oct-10	2125	<0.1	1.3	468	**4010**	0.06	3	<2	0.05	0.3	**0.30**	0.01	<1	<0.02	60	<5	<0.02	<10	10	
09-Nov-10	2190			481		0.06	3	<2	0.06		**0.39**	0.01	<1	<0.02	70	<5		<10	10	
28-Oct-11	2367	<0.1		358		<0.02	4	<2	<0.02	0.2	**1.64**	<0.01	<1	<0.02	60	<5		<10	9	
12-Oct-12	2560			328		<0.1	4	<2	<1		**0.32**		<4	<0.1	12	**2.1**		<3	6	
22-Oct-13	2742			387		<0.02	3	<2	<0.02		**0.39**		1	<0.02	70	<5		<10	<5	
15-Oct-14	2934			403		<0.02	2	2	0.04		**0.39**		1	<0.02	60	**1.6**		<10	**49**	
24-Sep-15	3141			374		<0.02	3	<2	<0.02		**0.33**	<0.01	<1	<0.02	70	**1.7**		<10	6	933
04-Oct-16	3286			403		0.03	3	<2	<0.02		**0.41**	<0.01	<1	0.06	70	**10.9**		<10	<5	947
11-Oct-17	3463			464		0.071	<2	<2	0.15		**0.44**	<0.01	<1	<0.02	**120**	<5		<10	5	886
10-Oct-18	3630			440		0.004	2.25	1.22	0.07		**0.97**		0.16	<0.05	13	**2.42**		1.9	5	
23-Oct-19	3818			417		0.06	2.79	2	2.87		**0.75**		0.09	<0.05	**384**	**2.24**		2.7	12	
02-Oct-20	4024			352		0.115	2.1	0.5	0.06		**1.74**		0.15	<0.05	12	**2.02**		0.9	<2	
04-Oct-21	4196			388		0.078	2.42	0.8	0.71		**1.23**		0.15	<0.05	**77**	**1.76**		1.2	6	
29-Sep-22	4354			426		0.004	2.3	2	<0.09		**1.58**		0.19	<0.05	12	**2.36**		1	<2	
26-Sep-23	4532			423		0.106	8.4	0.8	<0.05		**3.7**	0.025	0.77	<0.01	15	**2.4**		9.6	2	
24-Sep-24	4655			388		0.011	12.5	1.2	0.12		**2.23**	0.01	0.15	<0.01	12	**1.4**		4.2	7	
TOTAL SAMPLES		2	1	16	1	16	16	16	16	2	16	8	16	16	16	16	1	16	16	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW7

SAND AQUIFER

OBSERVATION WELL
Screen 218.9 - 213.1 masl

FORMERLY GP-KP1
CONVERTED Apr 11

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
13-Oct-10	2126			475	**601**	0.07	<2	<2	0.09	1.9	0.02	0.04	<1	<0.02	50	<5		<10	13	
28-Oct-11	2368	<0.1		334		<0.02	<2	<2	<0.02	0.2	**1.36**	<0.01	<1	<0.02	50	<5		<10	9	
12-Oct-12	2561			316		<0.1	4	3	<1		**0.04**		<4	<0.1	9	**1.7**		<3	6	
22-Oct-13	2743			312		<0.02	<2	<2	<0.02		**0.08**		1	<0.02	60	<5		<10	<5	
14-Oct-14	2935			245		<0.02	<2	<2	<0.02		**0.06**		<1	<0.02	40	0.9		<10	<5	
23-Sep-15	3142			311		<0.02	<2	<2	<0.02		**0.06**	<0.01	<1	<0.02	50	**1**		<10	<5	839
03-Oct-16	3287			241		0.09	<2	<2	<0.02		**0.06**	<0.01	<1	<0.02	40	**1.5**		<10	<5	684
11-Oct-17	3464			212		<0.014	<2	<2	<0.02		**0.05**	<0.01	<1	<0.02	**80**	<5		<10	<5	504
10-Oct-18	3631			238		0.364	0.66	1.73	0.08		**0.25**		0.08	<0.05	4	0.843		0.6	4	
21-Oct-19	3819			537		0.011	0.33	0.6	0.05		**0.49**		0.09	<0.05	3	**1.69**		3.2	2	
02-Oct-20	4025			219		0.018	0.49	0.6	0.05		**0.34**		0.09	<0.05	3	0.585		0.6	3	
04-Oct-21	4197			240		0.003	0.69	0.8	<0.09		**1.35**		0.07	<0.05	7	0.563		0.4	3	
28-Sep-22	4355			269		0.007	0.6	<0.2	<0.09		**0.45**		<0.04	<0.05	3	**0.922**		0.6	<2	
25-Sep-23	4533			300		0.037	2.4	1.3	<0.05		**0.235**	0.02	0.7	<0.01	8	**1.4**		7.5	1	
23-Sep-24	4656			266		0.033	7.7	1.2	0.08		**0.096**	<0.005	0.88	<0.01	3	**1**		3	8	
TOTAL SAMPLES		1	0	15	1	15	15	15	15	2	15	7	15	15	15	15	0	15	15	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW8

SAND AQUIFER

OBSERVATION WELL
Screen 221.3 - 219.0 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
08-Aug-13	2662			151		0.03	<2	<2	0.1		<0.01		<1	<0.02	50	**7**		<10	17	
22-Oct-13	2744			255		<0.02	<2	<2	0.04		**0.13**		<1	<0.02	60	<5		<10	7	
15-Oct-14	2936			173		<0.02	<2	3	0.07		0.01		<1	<0.02	40	**3.2**		<10	**60**	
24-Sep-15	3143			251		<0.02	<2	<2	<0.02		**0.14**	<0.01	<1	<0.02	50	0.5		<10	10	651
03-Oct-16	3288			249		<0.02	<2	<2	<0.02		**0.09**	<0.01	<1	<0.02	50	0.9		<10	5	723
10-Oct-17	3465			290		<0.014	<2	<2	0.02		**0.15**	<0.01	<1	<0.02	**110**	<5		<10	<5	609
09-Oct-18	3632			274		<0.003	0.6	2.12	0.15		**0.52**		0.08	<0.05	4	0.566		9.1	7	
21-Oct-19	3820			173		<0.003	0.26	1.7	0.14		**0.14**		0.06	<0.05	3	**2.02**		15.6	4	
01-Oct-20	4026			239		<0.003	0.52	0.5	0.07		**0.39**		0.05	<0.05	2	0.327		3.6	4	
05-Oct-21	4198			231		0.004	0.79	0.3	<0.09		**0.04**		0.07	<0.05	6	0.557		22	3	
28-Sep-22	4356			130		**1.455**	0.5	2.7	0.34		**0.48**		0.04	<0.05	7	**1.58**		**84.9**	11	
27-Sep-23	4534			286		0.015	6.5	2.2	<0.05		**0.143**	0.007	0.43	<0.01	6	**1.1**		11.1	1	
24-Sep-24	4657			169		<0.005	4.8	1.7	<0.05		**0.15**	0.006	0.61	<0.01	<1	0.7		7.2	3	
TOTAL SAMPLES		0	0	13	0	13	13	13	13	0	13	5	13	13	13	13	0	13	13	3
AVERAGE 2024																				

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW9-I

SAND AQUIFER CONTACT

OBSERVATION WELL
Screen 215.7 - 214.0 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
27-Sep-22	4357			193		0.01	0.35	4.3	0.15		<0.03		0.31	<0.05	49	**11.2**		21.1	3	
26-Sep-23	4535			464		0.019	4.3	3.7	<0.05		**12.8**	0.031	1.29	<0.01	3	**8.2**		18.9	1	
23-Sep-24	4658			311		0.024	8	4.1	0.15		**0.331**	0.026	0.78	<0.01	5	**8.1**		17.5	7	

TOTAL SAMPLES	0	0	3	0	3	3	3	3	0	3	2	3	3	3	3	0	3	3	0
AVERAGE 2024																			

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

OW9-II

UPPER SAND / SILTY SAND

OBSERVATION WELL
Screen 219.8 - 216.7 masl

DATE	SAMPLE #	Sb	As	Ba	B	Cd	Cr	Cu	Pb	Mo	P mg/L	PO4 mg/L	Se	Ag	Al	Co	Hg	Ni	Zn	TDS mg/L
	PWQO	20	5		200	0.5		5	5	40	0.02		100	0.1	75	0.9	0.2	25	20	
27-Sep-22	4358			87.4		0.016	0.25	**7.8**	<0.09		**0.39**		4.71	<0.05	3	**2.24**		8.9	<2	
26-Sep-23	4536			96.7		0.06	4.6	**8.6**	<0.05		**3.28**	0.011	3.14	<0.01	6	**2.5**		7.5	2	
23-Sep-24	4659			91.1		0.118	6.5	**15.9**	0.14		**0.134**	<0.005	2.02	0.02	3	**3.7**		13.5	10	

TOTAL SAMPLES	0	0	3	0	3	3	3	3	0	3	2	3	3	3	3	0	3	3	0
AVERAGE 2024																			

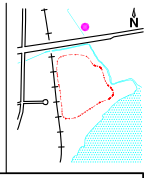
all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

BH1-IR

SAND AQUIFER

OBSERVATION WELL
Screen 209.7 - 208.2 masl

FORMERLY BH1-1
CONVERTED Jul 12



DATE	SAMPLE #	Sb	As	Ba	Cd	Cr	Cu	Pb	Mo	P	Se	Ag	Al	Be	Co	Ni	Zn	TDS
										mg/L								mg/L
	PWQO	20	5		0.5		5	5	40	0.02	100	0.1	75	1100	0.9	25	20	
30-Sep-14	2890									0.01								
15-Apr-15	2972									<0.01								199
20-Jul-15	3032			98	<0.02	<2	<0.1	<0.02		<0.01	<1	<0.02	<10		<0.1	<10	<5	180
28-Sep-15	3091									0.01								175
19-Apr-16	3163									<0.01								188
17-Jul-16	3199			96	0.02	<2	<2	<0.02		0.02	<1	<0.02	<10		<5	<10	9	171
17-Oct-16	3291									<0.01								176
24-Apr-17	3326									<0.01								168
18-Jul-17	3392			98	<0.014	<2	<2	<0.02		0.01	<1	<0.02	<10		<5	<10	<5	169
17-Oct-17	3468									0.02								164
23-Apr-18	3519									**0.08**								
16-Jul-18	3572			243	0.019	0.11	0.46	0.03		**0.24**	<0.04	<0.05	3		0.648	0.4	3	
15-Oct-18	3645									**0.23**								
23-Apr-19	3697									**1.45**								
15-Jul-19	3474			228	0.019	0.22	2.5	0.11		**0.28**	0.05	<0.05	4		0.69	0.8	5	
15-Oct-19	3823									**0.23**								
14-Apr-20	3859									**0.15**								
08-Jul-20	3911			122	0.004	0.15	0.5	0.03		**0.35**	<0.04	<0.05	5		0.293	0.4	2	
08-Oct-20	3967									**0.34**								
12-Jul-21	4093			213	<0.003	0.32	1.8	<0.09		**0.46**	0.07	<0.05	35		**1.04**	1.2	5	
29-Sep-21	4151									**0.81**								
11-Apr-22	4217									**0.14**								
11-Jul-22	4285			106	0.028	0.1	0.4	<0.09		**0.17**	<0.04	<0.05	2		0.178	<0.1	<2	
04-Oct-22	4361									**0.22**								
11-Apr-23	4413									**1.61**								
10-Jul-23	4462			210	0.023	1.6	2.9	<0.05		**1.18**	0.33	<0.01	6		**1.2**	3.8	1	
04-Oct-23	4539									**1.21**								
08-Apr-24	4612									**0.275**								
08-Jul-24	4640			171	0.033	0.9	3.3	<0.05		**0.032**	0.16	<0.01	13		**1.2**	4.3	2	
01-Oct-24	4683									**0.347**								

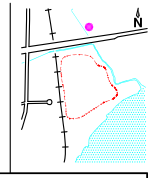
TOTAL SAMPLES	0	9	38	38	38	38	38	3	80	35	38	38	3	38	38	38	31
AVERAGE 2024									0.2180								

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

BH1-III

PEAT

OBSERVATION WELL
Screen 218.8 - 218.2 masl



DATE	SAMPLE #	Sb	As	Ba	Cd	Cr	Cu	Pb	Mo	P mg/L	Se	Ag	Al	Be	Co	Ni	Zn	TDS mg/L
	PWQO	20	5		0.5		5	5	40	0.02	100	0.1	75	1100	0.9	25	20	
30-Sep-14	2891									**0.03**								
15-Apr-15	2973									0.02								625
20-Jul-15	3033									**0.03**								912
28-Sep-15	3092									**0.04**								1030
19-Apr-16	3164									0.01								630
17-Jul-16	3200									0.02								959
17-Oct-16	3292									<0.01								1140
24-Apr-17	3327									**0.04**								570
18-Jul-17	3393									**0.04**								747
17-Oct-17	3469									0.02								1168
23-Apr-18	3520									**1.51**								
16-Jul-18	3573									**1.92**								
15-Oct-18	3646									**2.68**								
23-Apr-19	3698									**1.77**								
15-Jul-19	3748									**1.35**								
15-Oct-19	3824									**0.82**								
14-Apr-20	3860									**1.38**								
08-Jul-20	3912									**3.14**								
08-Oct-20	3968									**1.58**								
12-Jul-21	4094									**1.45**								
29-Sep-21	4152									**3.77**								
11-Apr-22	4218									**1.50**								
11-Jul-22	4286									**1.57**								
04-Oct-22	4362									**5.44**								
11-Apr-23	4414									**2.80**								
10-Jul-23	4463									**2.60**								
04-Oct-23	4540									**1.34**								
08-Apr-24	4613									**0.706**								
08-Jul-24	4641									**0.349**								
01-Oct-24	4684									**6.57**								

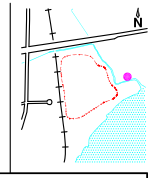
TOTAL SAMPLES	0	9	19	19	19	19	19	4	73	15	19	19	4	19	19	19	31
AVERAGE 2024									2.542								

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

BH28-I

SAND AQUIFER

OBSERVATION WELL
Screen 218.0 - 216.5 masl



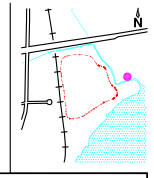
DATE	SAMPLE #	Sb	As	Ba	Cd	Cr	Cu	Pb	Mo	P	Se	Ag	Al	Be	Co	Ni	Zn	TDS
										mg/L								mg/L
	PWQO	20	5		0.5		5	5	40	0.02	100	0.1	75	1100	0.9	25	20	
31-Oct-08	810313																	822
23-Apr-09	0911681																	696
22-Jul-09	B09-2222																	772
30-Oct-09	0934218																	775
23-Apr-10	2033									0.01								
23-Jul-10	2093									0.01								
21-Oct-10	2138									0.02								
13-Apr-11	2215									**0.15**								
21-Jul-11	2256									**1.23**								
19-Oct-11	2313									**0.07**								
27-Apr-12	2380									0.01								
25-Jul-12	2457									**0.03**								
16-Oct-12	2523									<0.02								
25-Apr-13	05955									<0.02								
31-Jul-13	2636									**0.03**								
10-Oct-13	2705									0.01								
30-Apr-14	2785									<0.01								
23-Jul-14	2847									<0.01								
29-Sep-14	2898									0.02								
17-Apr-15	2981									0.01								751
24-Sep-15	3128									<0.01								769
05-Oct-16	3273									0.01								780
12-Oct-17	3451									<0.01								720
10-Oct-18	3617									**0.07**								
21-Oct-19	3805									**0.18**								
05-Oct-20	4011									**0.06**								
05-Oct-21	4185									**0.05**								
27-Sep-22	4343									**0.10**								
26-Sep-23	4520									**0.194**								
23-Sep-24	4643									<0.002								
TOTAL SAMPLES		0	9	17	17	17	17	17	3	46	14	17	17	3	17	17	17	26
AVERAGE 2024																		

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

BH28-II

FILL

OBSERVATION WELL
Screen 220.4 - 218.9 masl



DATE	SAMPLE #	Sb	As	Ba	Cd	Cr	Cu	Pb	Mo	P	Se	Ag	Al	Be	Co	Ni	Zn	TDS
										mg/L								mg/L
	PWQO	20	5		0.5		5	5	40	0.02	100	0.1	75	1100	0.9	25	20	
25-Jul-08	87253			194	<0.02	<2	2	1.0		**1.09**	0.9	<5	60		<5	<10	8	414
31-Oct-08	810313																	595
23-Apr-09	0911682																	343
22-Jul-09	B09-239			224	<0.02	<2	<2	<0.02		**3.82**	1.6	<0.02	30		<5	<10	16	569
30-Oct-09	0934211																	513
23-Apr-10	2034									**1.30**								
23-Jul-10	2094			272	0.08	2	<2	0.1		**0.84**	<1	<0.02	20		<5	<10	<5	
21-Oct-10	2139									**2.25**								
13-Apr-11	2216									**0.31**								
19-Oct-11	2314									**0.34**								
27-Apr-12	2381									**1.56**								
25-Jul-12	2458			256	<0.1	9	<2	<1		**1.78**	<4	<0.1	25		**2.2**	15	14	
16-Oct-12	2524									**0.74**								
25-Apr-13	06033									**0.10**								
31-Jul-13	2637			261	0.05	<2	<2	0.2		**3.96**	<1	<0.02	60		<5	<10	<5	
10-Oct-13	2706									**1.28**								
30-Apr-14	2786									**0.06**								
23-Jul-14	2848			282	<0.02	<2	<2	0.16		**1.70**	<1	<0.02	40		0.9	<10	17	
29-Sep-14	2899									**0.80**								
17-Apr-15	2982									**0.17**								333
24-Sep-15	3129			143	<0.02	4	<2	0.18		**7.05**	1	<0.02	50		**1.8**	10	<5	731
05-Oct-16	3274			293	<0.02	3	<2	<0.02		**4.96**	<1	<0.02	50		**4.5**	<10	<5	684
12-Oct-17	3452			186	<0.014	<2	<2	<0.02		**2.28**	<1	<0.02	**110**		<5	10	<5	768
10-Oct-18	3618			79.1	0.032	3.7	0.64	0.07		**1.57**	0.48	<0.05	6		**1.83**	16.1	4	
21-Oct-19	3806			279	0.019	0.81	2	0.18		**0.43**	0.29	<0.05	4		0.784	5.2	**99**	
05-Oct-20	4012			240	0.005	2.88	2.2	0.16		**5.85**	0.31	<0.05	12		0.626	4.5	6	
05-Oct-21	4186			177	0.042	2.99	1.3	0.7		**2.30**	0.29	<0.05	28		**1.07**	7	**48**	
27-Sep-22	4344			254	0.015	2.94	2.6	0.22		**8.48**	0.36	<0.05	12		**1.4**	10.7	**46**	
26-Sep-23	4521			208	0.034	5.2	1.9	0.18		**10.6**	0.61	<0.01	18		**1.3**	13.4	**21**	
23-Sep-24	4644			35.5	0.023	10.1	2.1	0.2		**5.07**	1.44	<0.01	5		**1.8**	14	16	
TOTAL SAMPLES		0	9	36	36	36	36	36	4	51	32	36	36	4	36	36	36	26
AVERAGE 2024																		

all Concentrations ug/L unless otherwise indicated
Anomalies shown in *Italics* / Exceedence in **BOLD**

Volatile Organic Compounds

Table B1
2024 KPL Water Quality Results - VOC

Monitor	Parameter	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Monochlorobenzene (Chlorobenzene)	Chloroethane	Chloroform	Chloromethane	Dibromochloromethane	Dibromoethane,1,2- (Ethylene Dibromide)	Dichlorobenzene,1,2-	Dichlorobenzene,1,3-	Dichlorobenzene,1,4-	Dichloroethane,1,1-	Dichloroethane,1,2-	Dichloroethene, 1,1-	Dichloroethylene, cis-1,2-	Dichloroethylene, trans-1,2-	Dichloropropane, 1,2-	Dichloropropylene, cis-1,3-	Dichloropropylene, trans-1,3-	Ethylbenzene	Ethylenedibromide	Dichloromethane (Methylene Chloride)	Styrene	Tetrachloroethane,1,1,1,2-	Tetrachloroethane,1,1,2,2-	Tetrachloroethylene	Toluene	Trichloroethane,1,1,1-	Trichloroethane,1,1,2-	Trichloroethylene	Trichlorofluoromethane	Vinyl Chloride	Xylene, m,p-	Xylene, o-
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	M.D.L.	0.5	0.5	0.5	0.5	0.2	0.5	5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.2	0.5	0.5
	PWQO	**100**	**200**	**60**	**0.9**	**-**	**15**	**-**	**-**	**700**	**40**	**-**	**2.5**	**2.5**	**4**	**200**	**100**	**40**	**200**	**200**	**0.7**	**-**	**7**	**8**	**-**	**-**	**4**	**20**	**70**	**50**	**0.8**	**10**	**800**	**20**	**-**	**600**	**32**	**40**
	ODWS	**5**	**-**	**-**	**-**	**5**	**80**	**-**	**-**	**-**	**-**	**-**	**200**	**-**	**5**	**-**	**5**	**14**	**-**	**-**	**-**	**-**	**-**	**2.4**	**-**	**-**	**-**	**-**	**-**	**30**	**24**	**-**	**-**	**5**	**-**	**2**	**300**	
OW1-I	27-Sep-24	4.3	<0.2	<0.5	<0.5	<0.2	9.7	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	**5.5**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	1.5	<0.5	<0.5
OW1-II	27-Sep-24	4.0	<0.2	<0.5	<0.5	<0.2	9.4	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	**5.8**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	1.1	<0.5	<0.5
OW1-III	27-Sep-24	2.0	<0.2	<0.5	<0.5	<0.2	2.8	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.5	<0.5
OW2-I	27-Sep-24	0.6	<0.2	<0.5	<0.5	<0.2	<0.5	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	1.8	<0.5	<0.5
OW2-II	27-Sep-24	1.3	<0.2	<0.5	<0.5	<0.2	1.7	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.5	<0.5
OW3	27-Sep-24	0.3	<0.2	<0.5	<0.5	<0.2	1.1	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.5	<0.5
OW4-I	27-Sep-24	<0.2	<0.2	<0.5	<0.5	<0.2	<0.5	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.5	<0.5
OW4-II	27-Sep-24	<0.2	<0.2	<0.5	<0.5	<0.2	<0.5	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.5	<0.5
OW6-I	27-Sep-24	2.0	<0.2	<0.5	<0.5	<0.2	**21.2**	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	3.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.1	**54.5**	<0.5
OW6-II	27-Sep-24	1.1	<0.2	<0.5	<0.5	<0.2	7.8	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.1	**1600.0**	<0.5
OW7	27-Sep-24	0.8	<0.2	<0.5	<0.5	<0.2	3.1	<0.3	<1	<0.3	<2	<0.2	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.1	4.6	<0.5

Note: Exceedances of the PWQO shown in **Bold**

APPENDIX C

Laboratory Certificates of Analysis

Your P.O. #: CA0034164.2458
Your Project #: CA0034164.2458
Site Location: KITCHENER PARK LANDFILL
Your C.O.C. #: N/A

Attention: Joel Robinson

WSP Canada Inc.
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2024/11/28
Report #: R8423771
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4Z9618
Received: 2024/11/15, 09:40

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Hydrogen Sulfide	3	N/A	2024/11/15	CAM SOP-00220	GC/FPD
Light Hydrocarbons	3	N/A	2024/11/18	CAM SOP-00204	GC/FID
Matrix Gases (1)	3	N/A	2024/11/18	CAM SOP-00225	GC/TCD
Volatile Organics in Air (ug/m3)	3	N/A	2024/11/18	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (2)	3	N/A	2024/11/15	BRL SOP-00304	EPA TO-15 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Argon interferes with Oxygen and is included in the reported Oxygen concentration. The atmosphere contains about 0.9% Argon.
(2) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas for a period of 5 calendar days or as contractually agreed from the date of this report, after which time

Your P.O. #: CA0034164.2458
Your Project #: CA0034164.2458
Site Location: KITCHENER PARK LANDFILL
Your C.O.C. #: N/A

Attention: Joel Robinson

WSP Canada Inc.
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2024/11/28
Report #: R8423771
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4Z9618
Received: 2024/11/15, 09:40

they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Cristina (Maria) Bacchus, Project Manager
Email: maria.bacchus@bureauveritas.com
Phone# (905)817-5763

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This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4Z9618
Report Date: 2024/11/28

WSP Canada Inc.
Client Project #: CA0034164.2458
Site Location: KITCHENER PARK LANDFILL
Your P.O. #: CA0034164.2458
Sampler Initials: DD

RESULTS OF ANALYSES OF AIR

Bureau Veritas ID		AIXF37	AIXF37	AIXF38	AIXF39		
Sampling Date		2024/11/14 11:30	2024/11/14 11:30	2024/11/14 12:00	2024/11/14 12:30		
COC Number		N/A	N/A	N/A	N/A		
	UNITS	GVP1	GVP1 Lab-Dup	GVP2	GVP3	RDL	QC Batch
Gas							
Methane	ppm	67	67	720	2	2	9773066

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4Z9618
Report Date: 2024/11/28

WSP Canada Inc.
Client Project #: CA0034164.2458
Site Location: KITCHENER PARK LANDFILL
Your P.O. #: CA0034164.2458
Sampler Initials: DD

COMPRESSED GAS PARAMETERS (AIR)

Bureau Veritas ID		AIXF37			AIXF37			AIXF38		
Sampling Date		2024/11/14 11:30			2024/11/14 11:30			2024/11/14 12:00		
COC Number		N/A			N/A			N/A		
	UNITS	GVP1	RDL	QC Batch	GVP1 Lab-Dup	RDL	QC Batch	GVP2	RDL	QC Batch
Fixed Gases										
Oxygen	% v/v	20.8	0.1	9772491				20.1	0.1	9772491
Carbon Dioxide	% v/v	0.9	0.1	9772491				1.5	0.1	9772491
Gas										
Hydrogen sulfide	ppmv	<0.8	0.8	9769173	<0.8	0.8	9769173	<0.8	0.8	9769173

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas ID		AIXF38			AIXF39		
Sampling Date		2024/11/14 12:00			2024/11/14 12:30		
COC Number		N/A			N/A		
	UNITS	GVP2 Lab-Dup	RDL	QC Batch	GVP3	RDL	QC Batch
Fixed Gases							
Oxygen	% v/v	20.1	0.1	9772491	21.7	0.1	9772491
Carbon Dioxide	% v/v	1.5	0.1	9772491	0.2	0.1	9772491
Gas							
Hydrogen sulfide	ppmv				<0.8	0.8	9769173

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		AIXF37		AIXF38		AIXF39		
Sampling Date		2024/11/14 11:30		2024/11/14 12:00		2024/11/14 12:30		
COC Number		N/A		N/A		N/A		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Volatile Organics								
Dichlorodifluoromethane (FREON 12)	ppbv	1.67	0.20	1.49	0.20	0.40	0.20	9771829
1,2-Dichlorotetrafluoroethane	ppbv	<0.17	0.17	0.45	0.17	<0.17	0.17	9771829
Chloromethane	ppbv	<0.30	0.30	<0.30	0.30	0.43	0.30	9771829
Vinyl Chloride	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
Chloroethane	ppbv	<0.30	0.30	<0.30	0.30	<0.30	0.30	9771829
1,3-Butadiene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9771829
Trichlorofluoromethane (FREON 11)	ppbv	<0.20	0.20	0.22	0.20	0.20	0.20	9771829
Ethanol (ethyl alcohol)	ppbv	5.0	1.0	4.4	1.0	2.9	1.0	9771829
Trichlorotrifluoroethane	ppbv	<0.15	0.15	<0.15	0.15	<0.15	0.15	9771829
2-propanol	ppbv	1.9	1.0	<1.0	1.0	<1.0	1.0	9771829
2-Propanone	ppbv	4.94	0.60	2.01	0.60	2.09	0.60	9771829
Methyl Ethyl Ketone (2-Butanone)	ppbv	0.28	0.20	<0.20	0.20	<0.20	0.20	9771829
Methyl Isobutyl Ketone	ppbv	1.74	0.20	<0.20	0.20	<0.20	0.20	9771829
Methyl Butyl Ketone (2-Hexanone)	ppbv	<1.0	1.0	<1.0	1.0	<1.0	1.0	9771829
Methyl t-butyl ether (MTBE)	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9771829
Ethyl Acetate	ppbv	<1.0	1.0	<1.0	1.0	<1.0	1.0	9771829
1,1-Dichloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
cis-1,2-Dichloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
trans-1,2-Dichloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
Methylene Chloride(Dichloromethane)	ppbv	<0.60	0.60	0.88	0.60	<0.60	0.60	9771829
Chloroform	ppbv	0.26	0.10	0.30	0.10	<0.10	0.10	9771829
Carbon Tetrachloride	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
1,1-Dichloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
1,2-Dichloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
Ethylene Dibromide	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
1,1,1-Trichloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
1,1,2-Trichloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
1,1,2,2-Tetrachloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
cis-1,3-Dichloropropene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
trans-1,3-Dichloropropene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		AIXF37		AIXF38		AIXF39		
Sampling Date		2024/11/14 11:30		2024/11/14 12:00		2024/11/14 12:30		
COC Number		N/A		N/A		N/A		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
1,2-Dichloropropane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
Bromomethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
Bromoform	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9771829
Bromodichloromethane	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9771829
Dibromochloromethane	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9771829
Trichloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
Tetrachloroethylene	ppbv	<0.10	0.10	0.18	0.10	<0.10	0.10	9771829
Benzene	ppbv	<0.10	0.10	0.11	0.10	0.12	0.10	9771829
Toluene	ppbv	1.72	0.10	2.87	0.10	2.40	0.10	9771829
Ethylbenzene	ppbv	0.16	0.10	0.16	0.10	0.13	0.10	9771829
p+m-Xylene	ppbv	0.67	0.20	0.67	0.20	0.53	0.20	9771829
o-Xylene	ppbv	0.23	0.10	0.22	0.10	0.17	0.10	9771829
Styrene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
4-ethyltoluene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9771829
1,3,5-Trimethylbenzene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9771829
1,2,4-Trimethylbenzene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9771829
Chlorobenzene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
Benzyl chloride	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9771829
1,3-Dichlorobenzene	ppbv	<0.40	0.40	<0.40	0.40	<0.40	0.40	9771829
1,4-Dichlorobenzene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
1,2-Dichlorobenzene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829
1,2,4-Trichlorobenzene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9771829
Hexachlorobutadiene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9771829
Hexane	ppbv	0.23	0.20	0.98	0.20	<0.20	0.20	9771829
Heptane	ppbv	<0.30	0.30	<0.30	0.30	<0.30	0.30	9771829
Cyclohexane	ppbv	<0.20	0.20	0.61	0.20	<0.20	0.20	9771829
Tetrahydrofuran	ppbv	<0.40	0.40	<0.40	0.40	<0.40	0.40	9771829
1,4-Dioxane	ppbv	<1.0	1.0	<1.0	1.0	<1.0	1.0	9771829
Naphthalene	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9771829
Total Xylenes	ppbv	0.90	0.30	0.89	0.30	0.70	0.30	9771829
1,1,1,2-Tetrachloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9771829

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Job #: C4Z9618
Report Date: 2024/11/28

WSP Canada Inc.
Client Project #: CA0034164.2458
Site Location: KITCHENER PARK LANDFILL
Your P.O. #: CA0034164.2458
Sampler Initials: DD

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		AIXF37		AIXF38		AIXF39		
Sampling Date		2024/11/14 11:30		2024/11/14 12:00		2024/11/14 12:30		
COC Number		N/A		N/A		N/A		
	UNITS	**GVP1**	**RDL**	**GVP2**	**RDL**	**GVP3**	**RDL**	**QC Batch**
Vinyl Bromide	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9771829
Propene	ppbv	<0.50	0.50	<3.0	3.0	<0.50	0.50	9771829
2,2,4-Trimethylpentane	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9771829
Carbon Disulfide	ppbv	1.73	0.50	<0.50	0.50	<0.50	0.50	9771829
Vinyl Acetate	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9771829
Surrogate Recovery (%)								
Bromochloromethane	%	92		88		89		9771829
D5-Chlorobenzene	%	94		90		92		9771829
Difluorobenzene	%	94		89		92		9771829

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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CALCULATED VOLATILE ORGANICS (AIR)

Bureau Veritas ID		AIXF37		AIXF38		AIXF39		
Sampling Date		2024/11/14 11:30		2024/11/14 12:00		2024/11/14 12:30		
COC Number		N/A		N/A		N/A		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Calculated Parameters								
Dichlorodifluoromethane (FREON 12)	ug/m3	8.28	0.99	7.36	0.99	1.98	0.99	9768276
1,2-Dichlorotetrafluoroethane	ug/m3	<1.2	1.2	3.1	1.2	<1.2	1.2	9768276
Chloromethane	ug/m3	<0.62	0.62	<0.62	0.62	0.89	0.62	9768276
Vinyl Chloride	ug/m3	<0.26	0.26	<0.26	0.26	<0.26	0.26	9768276
Chloroethane	ug/m3	<0.79	0.79	<0.79	0.79	<0.79	0.79	9768276
1,3-Butadiene	ug/m3	<1.1	1.1	<1.1	1.1	<1.1	1.1	9768276
Trichlorofluoromethane (FREON 11)	ug/m3	<1.1	1.1	1.2	1.1	1.1	1.1	9768276
Ethanol (ethyl alcohol)	ug/m3	9.5	1.9	8.3	1.9	5.5	1.9	9768276
Trichlorotrifluoroethane	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	9768276
2-propanol	ug/m3	4.6	2.5	<2.5	2.5	<2.5	2.5	9768276
2-Propanone	ug/m3	11.7	1.4	4.8	1.4	5.0	1.4	9768276
Methyl Ethyl Ketone (2-Butanone)	ug/m3	0.84	0.59	<0.59	0.59	<0.59	0.59	9768276
Methyl Isobutyl Ketone	ug/m3	7.13	0.82	<0.82	0.82	<0.82	0.82	9768276
Methyl Butyl Ketone (2-Hexanone)	ug/m3	<4.1	4.1	<4.1	4.1	<4.1	4.1	9768276
Methyl t-butyl ether (MTBE)	ug/m3	<0.72	0.72	<0.72	0.72	<0.72	0.72	9768276
Ethyl Acetate	ug/m3	<3.6	3.6	<3.6	3.6	<3.6	3.6	9768276
1,1-Dichloroethylene	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9768276
cis-1,2-Dichloroethylene	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9768276
trans-1,2-Dichloroethylene	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9768276
Methylene Chloride(Dichloromethane)	ug/m3	<2.1	2.1	3.1	2.1	<2.1	2.1	9768276
Chloroform	ug/m3	1.25	0.49	1.46	0.49	<0.49	0.49	9768276
Carbon Tetrachloride	ug/m3	<0.63	0.63	<0.63	0.63	<0.63	0.63	9768276
1,1-Dichloroethane	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9768276
1,2-Dichloroethane	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9768276
Ethylene Dibromide	ug/m3	<0.77	0.77	<0.77	0.77	<0.77	0.77	9768276
1,1,1-Trichloroethane	ug/m3	<0.55	0.55	<0.55	0.55	<0.55	0.55	9768276
1,1,2-Trichloroethane	ug/m3	<0.55	0.55	<0.55	0.55	<0.55	0.55	9768276
1,1,2,2-Tetrachloroethane	ug/m3	<0.69	0.69	<0.69	0.69	<0.69	0.69	9768276
cis-1,3-Dichloropropene	ug/m3	<0.45	0.45	<0.45	0.45	<0.45	0.45	9768276
trans-1,3-Dichloropropene	ug/m3	<0.45	0.45	<0.45	0.45	<0.45	0.45	9768276

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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CALCULATED VOLATILE ORGANICS (AIR)

Bureau Veritas ID		AIXF37		AIXF38		AIXF39		
Sampling Date		2024/11/14 11:30		2024/11/14 12:00		2024/11/14 12:30		
COC Number		N/A		N/A		N/A		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
1,2-Dichloropropane	ug/m3	<0.46	0.46	<0.46	0.46	<0.46	0.46	9768276
Bromomethane	ug/m3	<0.39	0.39	<0.39	0.39	<0.39	0.39	9768276
Bromoform	ug/m3	<2.1	2.1	<2.1	2.1	<2.1	2.1	9768276
Bromodichloromethane	ug/m3	<1.3	1.3	<1.3	1.3	<1.3	1.3	9768276
Dibromochloromethane	ug/m3	<1.7	1.7	<1.7	1.7	<1.7	1.7	9768276
Trichloroethylene	ug/m3	<0.54	0.54	<0.54	0.54	<0.54	0.54	9768276
Tetrachloroethylene	ug/m3	<0.68	0.68	1.24	0.68	<0.68	0.68	9768276
Benzene	ug/m3	<0.32	0.32	0.37	0.32	0.37	0.32	9768276
Toluene	ug/m3	6.50	0.38	10.8	0.38	9.05	0.38	9768276
Ethylbenzene	ug/m3	0.69	0.43	0.71	0.43	0.59	0.43	9768276
p+m-Xylene	ug/m3	2.92	0.87	2.91	0.87	2.28	0.87	9768276
o-Xylene	ug/m3	1.00	0.43	0.97	0.43	0.75	0.43	9768276
Styrene	ug/m3	<0.43	0.43	<0.43	0.43	<0.43	0.43	9768276
4-ethyltoluene	ug/m3	<2.5	2.5	<2.5	2.5	<2.5	2.5	9768276
1,3,5-Trimethylbenzene	ug/m3	<2.5	2.5	<2.5	2.5	<2.5	2.5	9768276
1,2,4-Trimethylbenzene	ug/m3	<2.5	2.5	<2.5	2.5	<2.5	2.5	9768276
Chlorobenzene	ug/m3	<0.46	0.46	<0.46	0.46	<0.46	0.46	9768276
Benzyl chloride	ug/m3	<2.6	2.6	<2.6	2.6	<2.6	2.6	9768276
1,3-Dichlorobenzene	ug/m3	<2.4	2.4	<2.4	2.4	<2.4	2.4	9768276
1,4-Dichlorobenzene	ug/m3	<0.60	0.60	<0.60	0.60	<0.60	0.60	9768276
1,2-Dichlorobenzene	ug/m3	<0.60	0.60	<0.60	0.60	<0.60	0.60	9768276
1,2,4-Trichlorobenzene	ug/m3	<3.7	3.7	<3.7	3.7	<3.7	3.7	9768276
Hexachlorobutadiene	ug/m3	<5.3	5.3	<5.3	5.3	<5.3	5.3	9768276
Hexane	ug/m3	0.82	0.70	3.45	0.70	<0.70	0.70	9768276
Heptane	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	9768276
Cyclohexane	ug/m3	<0.69	0.69	2.10	0.69	<0.69	0.69	9768276
Tetrahydrofuran	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	9768276
1,4-Dioxane	ug/m3	<3.6	3.6	<3.6	3.6	<3.6	3.6	9768276
Naphthalene	ug/m3	<1.0	1.0	<1.0	1.0	<1.0	1.0	9768276
Total Xylenes	ug/m3	3.9	1.3	3.9	1.3	3.0	1.3	9768276
1,1,1,2-Tetrachloroethane	ug/m3	<0.69	0.69	<0.69	0.69	<0.69	0.69	9768276

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

CALCULATED VOLATILE ORGANICS (AIR)

Bureau Veritas ID		AIXF37		AIXF38		AIXF39		
Sampling Date		2024/11/14 11:30		2024/11/14 12:00		2024/11/14 12:30		
COC Number		N/A		N/A		N/A		
	UNITS	**GVP1**	**RDL**	**GVP2**	**RDL**	**GVP3**	**RDL**	**QC Batch**
Vinyl Bromide	ug/m3	<0.87	0.87	<0.87	0.87	<0.87	0.87	9768276
Propene	ug/m3	<0.86	0.86	<5.2	5.2	<0.86	0.86	9768276
2,2,4-Trimethylpentane	ug/m3	<0.93	0.93	<0.93	0.93	<0.93	0.93	9768276
Carbon Disulfide	ug/m3	5.4	1.6	<1.6	1.6	<1.6	1.6	9768276
Vinyl Acetate	ug/m3	<0.70	0.70	<0.70	0.70	<0.70	0.70	9768276

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Job #: C4Z9618
Report Date: 2024/11/28

WSP Canada Inc.
Client Project #: CA0034164.2458
Site Location: KITCHENER PARK LANDFILL
Your P.O. #: CA0034164.2458
Sampler Initials: DD

TEST SUMMARY

Bureau Veritas ID: AIXF37
Sample ID: GVP1
Matrix: Air
Collected: 2024/11/14
Shipped:
Received: 2024/11/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	9769173	N/A	2024/11/15	Iqbal Hasan
Light Hydrocarbons	GC/FID	9773066	N/A	2024/11/18	Vasan Thiagarajah
Matrix Gases	GC/TCD	9772491	N/A	2024/11/18	Vasan Thiagarajah
Volatile Organics in Air (ug/m3)	GC/MS	9768276	N/A	2024/11/18	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	9771829	N/A	2024/11/15	Ana Nunes

Bureau Veritas ID: AIXF37 Dup
Sample ID: GVP1
Matrix: Air
Collected: 2024/11/14
Shipped:
Received: 2024/11/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	9769173	N/A	2024/11/15	Iqbal Hasan
Light Hydrocarbons	GC/FID	9773066	N/A	2024/11/18	Vasan Thiagarajah

Bureau Veritas ID: AIXF38
Sample ID: GVP2
Matrix: Air
Collected: 2024/11/14
Shipped:
Received: 2024/11/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	9769173	N/A	2024/11/15	Iqbal Hasan
Light Hydrocarbons	GC/FID	9773066	N/A	2024/11/18	Vasan Thiagarajah
Matrix Gases	GC/TCD	9772491	N/A	2024/11/18	Vasan Thiagarajah
Volatile Organics in Air (ug/m3)	GC/MS	9768276	N/A	2024/11/18	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	9771829	N/A	2024/11/15	Ana Nunes

Bureau Veritas ID: AIXF38 Dup
Sample ID: GVP2
Matrix: Air
Collected: 2024/11/14
Shipped:
Received: 2024/11/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Matrix Gases	GC/TCD	9772491	N/A	2024/11/18	Vasan Thiagarajah

Bureau Veritas ID: AIXF39
Sample ID: GVP3
Matrix: Air
Collected: 2024/11/14
Shipped:
Received: 2024/11/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	9769173	N/A	2024/11/15	Iqbal Hasan
Light Hydrocarbons	GC/FID	9773066	N/A	2024/11/18	Vasan Thiagarajah
Matrix Gases	GC/TCD	9772491	N/A	2024/11/18	Vasan Thiagarajah
Volatile Organics in Air (ug/m3)	GC/MS	9768276	N/A	2024/11/18	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	9771829	N/A	2024/11/15	Ana Nunes

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GENERAL COMMENTS

Matrix Gas Analysis: Results normalized to 100% dry volume.
Ethanol exceeded 40% RSD in the initial calibration. The continuing calibration standard and the reference standard were acceptable therefore there should be no effect on the data.

Sample AIXF38 [GVP2] : Increased DL for propene due to interference from propane.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9769173	IH0	Method Blank	Hydrogen sulfide	2024/11/15	<0.4		ppmv	
9769173	IH0	RPD [AIXF37-01]	Hydrogen sulfide	2024/11/15	NC		%	25
9771829	ANE	Spiked Blank	Bromochloromethane	2024/11/15		103	%	60 - 140
			D5-Chlorobenzene	2024/11/15		103	%	60 - 140
			Difluorobenzene	2024/11/15		103	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2024/11/15		86	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2024/11/15		97	%	70 - 130
			Chloromethane	2024/11/15		94	%	70 - 130
			Vinyl Chloride	2024/11/15		91	%	70 - 130
			Chloroethane	2024/11/15		91	%	70 - 130
			1,3-Butadiene	2024/11/15		98	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2024/11/15		98	%	70 - 130
			Ethanol (ethyl alcohol)	2024/11/15		80	%	70 - 130
			Trichlorotrifluoroethane	2024/11/15		92	%	70 - 130
			2-propanol	2024/11/15		105	%	70 - 130
			2-Propanone	2024/11/15		106	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2024/11/15		94	%	70 - 130
			Methyl Isobutyl Ketone	2024/11/15		98	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2024/11/15		96	%	70 - 130
			Methyl t-butyl ether (MTBE)	2024/11/15		96	%	70 - 130
			Ethyl Acetate	2024/11/15		98	%	70 - 130
			1,1-Dichloroethylene	2024/11/15		104	%	70 - 130
			cis-1,2-Dichloroethylene	2024/11/15		89	%	70 - 130
			trans-1,2-Dichloroethylene	2024/11/15		98	%	70 - 130
			Methylene Chloride(Dichloromethane)	2024/11/15		86	%	70 - 130
			Chloroform	2024/11/15		92	%	70 - 130
			Carbon Tetrachloride	2024/11/15		99	%	70 - 130
			1,1-Dichloroethane	2024/11/15		92	%	70 - 130
			1,2-Dichloroethane	2024/11/15		88	%	70 - 130
			Ethylene Dibromide	2024/11/15		96	%	70 - 130
			1,1,1-Trichloroethane	2024/11/15		90	%	70 - 130
			1,1,2-Trichloroethane	2024/11/15		94	%	70 - 130
			1,1,2,2-Tetrachloroethane	2024/11/15		92	%	70 - 130
			cis-1,3-Dichloropropene	2024/11/15		96	%	70 - 130
			trans-1,3-Dichloropropene	2024/11/15		98	%	70 - 130
			1,2-Dichloropropane	2024/11/15		91	%	70 - 130
			Bromomethane	2024/11/15		89	%	70 - 130
			Bromoform	2024/11/15		137 (1)	%	70 - 130
			Bromodichloromethane	2024/11/15		108	%	70 - 130
			Dibromochloromethane	2024/11/15		123	%	70 - 130
			Trichloroethylene	2024/11/15		96	%	70 - 130
			Tetrachloroethylene	2024/11/15		97	%	70 - 130
			Benzene	2024/11/15		94	%	70 - 130
			Toluene	2024/11/15		95	%	70 - 130
			Ethylbenzene	2024/11/15		95	%	70 - 130
			p+m-Xylene	2024/11/15		96	%	70 - 130
			o-Xylene	2024/11/15		97	%	70 - 130
			Styrene	2024/11/15		100	%	70 - 130
			4-ethyltoluene	2024/11/15		120	%	70 - 130
			1,3,5-Trimethylbenzene	2024/11/15		97	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2,4-Trimethylbenzene	2024/11/15		96	%	70 - 130
			Chlorobenzene	2024/11/15		94	%	70 - 130
			Benzyl chloride	2024/11/15		125	%	70 - 130
			1,3-Dichlorobenzene	2024/11/15		98	%	70 - 130
			1,4-Dichlorobenzene	2024/11/15		99	%	70 - 130
			1,2-Dichlorobenzene	2024/11/15		95	%	70 - 130
			1,2,4-Trichlorobenzene	2024/11/15		91	%	70 - 130
			Hexachlorobutadiene	2024/11/15		87	%	70 - 130
			Hexane	2024/11/15		102	%	70 - 130
			Heptane	2024/11/15		103	%	70 - 130
			Cyclohexane	2024/11/15		101	%	70 - 130
			Tetrahydrofuran	2024/11/15		95	%	70 - 130
			1,4-Dioxane	2024/11/15		92	%	70 - 130
			Naphthalene	2024/11/15		83	%	70 - 130
			Total Xylenes	2024/11/15		96	%	70 - 130
			1,1,1,2-Tetrachloroethane	2024/11/15		108	%	70 - 130
			Vinyl Bromide	2024/11/15		99	%	70 - 130
			Propene	2024/11/15		82	%	70 - 130
			2,2,4-Trimethylpentane	2024/11/15		108	%	70 - 130
			Carbon Disulfide	2024/11/15		106	%	70 - 130
			Vinyl Acetate	2024/11/15		90	%	70 - 130
9771829	ANE	Method Blank	Bromochloromethane	2024/11/15		101	%	60 - 140
			D5-Chlorobenzene	2024/11/15		99	%	60 - 140
			Difluorobenzene	2024/11/15		104	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2024/11/15	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2024/11/15	<0.17		ppbv	
			Chloromethane	2024/11/15	<0.30		ppbv	
			Vinyl Chloride	2024/11/15	<0.10		ppbv	
			Chloroethane	2024/11/15	<0.30		ppbv	
			1,3-Butadiene	2024/11/15	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2024/11/15	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2024/11/15	<1.0		ppbv	
			Trichlorotrifluoroethane	2024/11/15	<0.15		ppbv	
			2-propanol	2024/11/15	<1.0		ppbv	
			2-Propanone	2024/11/15	<0.60		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2024/11/15	<0.20		ppbv	
			Methyl Isobutyl Ketone	2024/11/15	<0.20		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2024/11/15	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2024/11/15	<0.20		ppbv	
			Ethyl Acetate	2024/11/15	<1.0		ppbv	
			1,1-Dichloroethylene	2024/11/15	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2024/11/15	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2024/11/15	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2024/11/15	<0.60		ppbv	
			Chloroform	2024/11/15	<0.10		ppbv	
			Carbon Tetrachloride	2024/11/15	<0.10		ppbv	
			1,1-Dichloroethane	2024/11/15	<0.10		ppbv	
			1,2-Dichloroethane	2024/11/15	<0.10		ppbv	
			Ethylene Dibromide	2024/11/15	<0.10		ppbv	
			1,1,1-Trichloroethane	2024/11/15	<0.10		ppbv	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,2-Trichloroethane	2024/11/15	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2024/11/15	<0.10		ppbv	
			cis-1,3-Dichloropropene	2024/11/15	<0.10		ppbv	
			trans-1,3-Dichloropropene	2024/11/15	<0.10		ppbv	
			1,2-Dichloropropane	2024/11/15	<0.10		ppbv	
			Bromomethane	2024/11/15	<0.10		ppbv	
			Bromoform	2024/11/15	<0.20		ppbv	
			Bromodichloromethane	2024/11/15	<0.20		ppbv	
			Dibromochloromethane	2024/11/15	<0.20		ppbv	
			Trichloroethylene	2024/11/15	<0.10		ppbv	
			Tetrachloroethylene	2024/11/15	<0.10		ppbv	
			Benzene	2024/11/15	<0.10		ppbv	
			Toluene	2024/11/15	<0.10		ppbv	
			Ethylbenzene	2024/11/15	<0.10		ppbv	
			p+m-Xylene	2024/11/15	<0.20		ppbv	
			o-Xylene	2024/11/15	<0.10		ppbv	
			Styrene	2024/11/15	<0.10		ppbv	
			4-ethyltoluene	2024/11/15	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2024/11/15	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2024/11/15	<0.50		ppbv	
			Chlorobenzene	2024/11/15	<0.10		ppbv	
			Benzyl chloride	2024/11/15	<0.50		ppbv	
			1,3-Dichlorobenzene	2024/11/15	<0.40		ppbv	
			1,4-Dichlorobenzene	2024/11/15	<0.10		ppbv	
			1,2-Dichlorobenzene	2024/11/15	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2024/11/15	<0.50		ppbv	
			Hexachlorobutadiene	2024/11/15	<0.50		ppbv	
			Hexane	2024/11/15	<0.20		ppbv	
			Heptane	2024/11/15	<0.30		ppbv	
			Cyclohexane	2024/11/15	<0.20		ppbv	
			Tetrahydrofuran	2024/11/15	<0.40		ppbv	
			1,4-Dioxane	2024/11/15	<1.0		ppbv	
			Naphthalene	2024/11/15	<0.20		ppbv	
			Total Xylenes	2024/11/15	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2024/11/15	<0.10		ppbv	
			Vinyl Bromide	2024/11/15	<0.20		ppbv	
			Propene	2024/11/15	<0.50		ppbv	
			2,2,4-Trimethylpentane	2024/11/15	<0.20		ppbv	
			Carbon Disulfide	2024/11/15	<0.50		ppbv	
			Vinyl Acetate	2024/11/15	<0.20		ppbv	
9772491	VTH	Method Blank	Oxygen	2024/11/18	<0.1		% v/v	
			Carbon Dioxide	2024/11/18	<0.1		% v/v	
9772491	VTH	RPD [AIXF38-01]	Oxygen	2024/11/18	0.050		%	20
			Carbon Dioxide	2024/11/18	0.65		%	20
9773066	VTH	Method Blank	Methane	2024/11/18	<2		ppm	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9773066	VTH	RPD [AIXF37-01]	Methane	2024/11/18	0.25		%	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Bureau Veritas Job #: C4Z9618
Report Date: 2024/11/28

WSP Canada Inc.
Client Project #: CA0034164.2458
Site Location: KITCHENER PARK LANDFILL
Your P.O. #: CA0034164.2458
Sampler Initials: DD

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Melanie Mabini, Team Leader

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

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C4Z9618
2024/11/15 09:40

Chain of Custody Form - AIR

39311

BUREAU VERITAS
6740 Campobello Rd
Mississauga Ontario, L5N 2L8
www.bvlabs.com
Toll Free: 1-800-668-0639
Phone: (905) 817-5700
Fax: (905) 817-5777

CAM FCD-01302 /3

Page 1 of 1

ANALYSIS REQUESTED

CLIENT INFORMATION

Company Name: WSP Canada Inc.
Project Manager: Joel Robinson
e-mail: Joel.Robinson@wsp.com
Address: 121 Commerce Park Drive, Unit L
Barrie, ON, L4N 8X1
Phone: 705-722-4492 Fax: -
Sampled by: Dan Demmings

SECTION

Field Sample ID	Total Volume Sampled	Flow Rate	Collection Date	Sample Collection Time	Methane	Hydrogen Sulphide	Oxygen	CO_2	VOCs
GVP 1	1L	100mL/min	Nov 14, 2024	11:30am	X	X	X	X	X
GVP 2	1L	100mL/min	Nov.14, 2024	12:00PM	X	X	X	X	X
GVP 3	1L	100mL/min	Nov.14, 2024	12:30PM	X	X	X	X	X

NONT-2024-11-3057

TAT Requirement

STD 10 Business day [X]
Rush 5 Business day * [ ]
Rush 2 Business day * [ ]
* need approval from Bureau Veritas

PROJECT INFORMATION

Project #: CA0034164.2458
Name: Kitchener Park Landfill
PO #: CA0034164.2458
BV Quote #:
BV Contact:

REPORTING REQUIREMENTS

Summary Report only [X]
EDD [X]
Regulation 153/04

Notes

Please note if these samples are "Industrial Hygiene" samples
If submitting dustfall samples, please indicate the diameter of the jar opening in cm.

PROJECT SPECIFIC COMMENTS

Client Signature:
Affiliation: Field Technician
Date/Time: Nov. 14, 2024 13:30

Received by: SL SUGAR SALVAN
Affiliation:
Date/Time: 2024/11/15 09:40

COC-1031 (11/2019)

Your Project #: CA-GLD-22578520
Site Location: KPL-ORILLIA
Your C.O.C. #: 38421

Attention: Joel Robinson

WSP Canada Inc.
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2024/03/11
Report #: R8061217
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C457768
Received: 2024/02/27, 09:10

Sample Matrix: Tedlar Bag
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Hydrogen Sulfide	3	N/A	2024/02/27	CAM SOP-00220	GC/FPD
Light Hydrocarbons	3	N/A	2024/02/27	CAM SOP-00204	GC/FID
Matrix Gases (1)	3	N/A	2024/02/27	CAM SOP-00225	GC/TCD
Volatile Organics in Air (ug/m3)	3	N/A	2024/02/27	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (2)	3	N/A	2024/02/27	BRL SOP-00304	EPA TO-15 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Argon interferes with Oxygen and is included in the reported Oxygen concentration. The atmosphere contains about 0.9% Argon.
(2) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas for a period of 5 calendar days or as contractually agreed from the date of this report, after which time

Your Project #: CA-GLD-22578520
Site Location: KPL-ORILLIA
Your C.O.C. #: 38421

Attention: Joel Robinson

WSP Canada Inc.
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2024/03/11
Report #: R8061217
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C457768

Received: 2024/02/27, 09:10

they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Cristina (Maria) Bacchus, Project Manager
Email: maria.bacchus@bureauveritas.com
Phone# (905)817-5763

==========

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Bureau Veritas Job #: C457768
Report Date: 2024/03/11

WSP Canada Inc.
Client Project #: CA-GLD-22578520
Site Location: KPL-ORILLIA
Sampler Initials: BD

RESULTS OF ANALYSES OF TEDLAR BAG

Bureau Veritas ID		YMC925	YMC925	YMC926	YMC927		
Sampling Date		2024/02/26 11:00	2024/02/26 11:00	2024/02/26 11:30	2024/02/26 12:15		
COC Number		38421	38421	38421	38421		
	UNITS	GVP1	GVP1 Lab-Dup	GVP2	GVP3	RDL	QC Batch
Gas							
Methane	ppm	7	7	57	2	2	9243726

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Bureau Veritas Job #: C457768
Report Date: 2024/03/11

WSP Canada Inc.
Client Project #: CA-GLD-22578520
Site Location: KPL-ORILLIA
Sampler Initials: BD

COMPRESSED GAS PARAMETERS (TEDLAR BAG)

Bureau Veritas ID		YMC925			YMC925			YMC926	YMC927		
Sampling Date		2024/02/26 11:00			2024/02/26 11:00			2024/02/26 11:30	2024/02/26 12:15		
COC Number		38421			38421			38421	38421		
	UNITS	GVP1	RDL	QC Batch	GVP1 Lab-Dup	RDL	QC Batch	GVP2	GVP3	RDL	QC Batch
Fixed Gases											
Oxygen	% v/v	21.0	0.1	9243730	21.0	0.1	9243730	21.4	21.8	0.1	9243730
Carbon Monoxide	% v/v	<0.1	0.1	9243730	<0.1	0.1	9243730	<0.1	<0.1	0.1	9243730
Carbon Dioxide	% v/v	0.6	0.1	9243730	0.6	0.1	9243730	0.4	<0.1	0.1	9243730
Gas											
Hydrogen sulfide	ppmv	<0.8	0.8	9243471				<0.8	<0.8	0.8	9243471

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas ID		YMC927		
Sampling Date		2024/02/26 12:15		
COC Number		38421		
	UNITS	GVP3 Lab-Dup	RDL	QC Batch
Gas				
Hydrogen sulfide	ppmv	<0.4	0.4	9243471

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		YMC925		YMC926		YMC927		
Sampling Date		2024/02/26 11:00		2024/02/26 11:30		2024/02/26 12:15		
COC Number		38421		38421		38421		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Volatile Organics								
Dichlorodifluoromethane (FREON 12)	ppbv	0.50	0.20	0.65	0.20	0.44	0.20	9242535
1,2-Dichlorotetrafluoroethane	ppbv	<0.17	0.17	<0.17	0.17	<0.17	0.17	9242535
Chloromethane	ppbv	0.49	0.30	<0.30	0.30	0.53	0.30	9242535
Vinyl Chloride	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
Chloroethane	ppbv	<0.30	0.30	<0.30	0.30	<0.30	0.30	9242535
1,3-Butadiene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9242535
Trichlorofluoromethane (FREON 11)	ppbv	<0.20	0.20	0.20	0.20	<0.20	0.20	9242535
Ethanol (ethyl alcohol)	ppbv	6.9	1.0	9.1	1.0	8.7	1.0	9242535
Trichlorotrifluoroethane	ppbv	<0.15	0.15	<0.15	0.15	<0.15	0.15	9242535
2-propanol	ppbv	1.5	1.0	2.1	1.0	2.0	1.0	9242535
2-Propanone	ppbv	3.31	0.60	3.01	0.60	3.61	0.60	9242535
Methyl Ethyl Ketone (2-Butanone)	ppbv	1.29	0.20	1.08	0.20	1.28	0.20	9242535
Methyl Isobutyl Ketone	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Methyl Butyl Ketone (2-Hexanone)	ppbv	<1.0	1.0	<1.0	1.0	<1.0	1.0	9242535
Methyl t-butyl ether (MTBE)	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Ethyl Acetate	ppbv	1.1	1.0	1.4	1.0	1.3	1.0	9242535
1,1-Dichloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
cis-1,2-Dichloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
trans-1,2-Dichloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
Methylene Chloride(Dichloromethane)	ppbv	<0.60	0.60	<0.60	0.60	<0.60	0.60	9242535
Chloroform	ppbv	<0.10	0.10	0.36	0.10	<0.10	0.10	9242535
Carbon Tetrachloride	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
1,1-Dichloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
1,2-Dichloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
Ethylene Dibromide	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
1,1,1-Trichloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
1,1,2-Trichloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
1,1,2,2-Tetrachloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
cis-1,3-Dichloropropene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
trans-1,3-Dichloropropene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
1,2-Dichloropropane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		YMC925		YMC926		YMC927		
Sampling Date		2024/02/26 11:00		2024/02/26 11:30		2024/02/26 12:15		
COC Number		38421		38421		38421		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Bromomethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
Bromoform	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Bromodichloromethane	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Dibromochloromethane	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Trichloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
Tetrachloroethylene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
Benzene	ppbv	0.17	0.10	0.15	0.10	0.21	0.10	9242535
Toluene	ppbv	0.78	0.10	1.03	0.10	0.91	0.10	9242535
Ethylbenzene	ppbv	0.14	0.10	0.17	0.10	0.15	0.10	9242535
p+m-Xylene	ppbv	0.48	0.20	0.63	0.20	0.54	0.20	9242535
o-Xylene	ppbv	0.18	0.10	0.22	0.10	0.19	0.10	9242535
Styrene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
4-ethyltoluene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9242535
1,3,5-Trimethylbenzene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9242535
1,2,4-Trimethylbenzene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9242535
Chlorobenzene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
Benzyl chloride	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9242535
1,3-Dichlorobenzene	ppbv	<0.40	0.40	<0.40	0.40	<0.40	0.40	9242535
1,4-Dichlorobenzene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
1,2-Dichlorobenzene	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
1,2,4-Trichlorobenzene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9242535
Hexachlorobutadiene	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9242535
Hexane	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Heptane	ppbv	<0.30	0.30	<0.30	0.30	<0.30	0.30	9242535
Cyclohexane	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Tetrahydrofuran	ppbv	<0.40	0.40	<0.40	0.40	<0.40	0.40	9242535
1,4-Dioxane	ppbv	<1.0	1.0	<1.0	1.0	<1.0	1.0	9242535
Naphthalene	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Total Xylenes	ppbv	0.66	0.30	0.85	0.30	0.73	0.30	9242535
1,1,1,2-Tetrachloroethane	ppbv	<0.10	0.10	<0.10	0.10	<0.10	0.10	9242535
Vinyl Bromide	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Propene	ppbv	<1.0	1.0	<0.50	0.50	<0.80	0.80	9242535

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Job #: C457768
Report Date: 2024/03/11

WSP Canada Inc.
Client Project #: CA-GLD-22578520
Site Location: KPL-ORILLIA
Sampler Initials: BD

VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		YMC925		YMC926		YMC927		
Sampling Date		2024/02/26 11:00		2024/02/26 11:30		2024/02/26 12:15		
COC Number		38421		38421		38421		
	UNITS	**GVP1**	**RDL**	**GVP2**	**RDL**	**GVP3**	**RDL**	**QC Batch**
2,2,4-Trimethylpentane	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Carbon Disulfide	ppbv	<0.50	0.50	<0.50	0.50	<0.50	0.50	9242535
Vinyl Acetate	ppbv	<0.20	0.20	<0.20	0.20	<0.20	0.20	9242535
Surrogate Recovery (%)								
Bromochloromethane	%	98		98		99		9242535
D5-Chlorobenzene	%	92		91		92		9242535
Difluorobenzene	%	99		99		99		9242535

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		YMC925		YMC926		YMC927		
Sampling Date		2024/02/26 11:00		2024/02/26 11:30		2024/02/26 12:15		
COC Number		38421		38421		38421		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Calculated Parameters								
Dichlorodifluoromethane (FREON 12)	ug/m3	2.45	0.99	3.20	0.99	2.15	0.99	9243097
1,2-Dichlorotetrafluoroethane	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	9243097
Chloromethane	ug/m3	1.02	0.62	<0.62	0.62	1.09	0.62	9243097
Vinyl Chloride	ug/m3	<0.26	0.26	<0.26	0.26	<0.26	0.26	9243097
Chloroethane	ug/m3	<0.79	0.79	<0.79	0.79	<0.79	0.79	9243097
1,3-Butadiene	ug/m3	<1.1	1.1	<1.1	1.1	<1.1	1.1	9243097
Trichlorofluoromethane (FREON 11)	ug/m3	<1.1	1.1	1.2	1.1	<1.1	1.1	9243097
Ethanol (ethyl alcohol)	ug/m3	13.1	1.9	17.2	1.9	16.3	1.9	9243097
Trichlorotrifluoroethane	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	9243097
2-propanol	ug/m3	3.7	2.5	5.2	2.5	4.9	2.5	9243097
2-Propanone	ug/m3	7.9	1.4	7.1	1.4	8.6	1.4	9243097
Methyl Ethyl Ketone (2-Butanone)	ug/m3	3.82	0.59	3.20	0.59	3.78	0.59	9243097
Methyl Isobutyl Ketone	ug/m3	<0.82	0.82	<0.82	0.82	<0.82	0.82	9243097
Methyl Butyl Ketone (2-Hexanone)	ug/m3	<4.1	4.1	<4.1	4.1	<4.1	4.1	9243097
Methyl t-butyl ether (MTBE)	ug/m3	<0.72	0.72	<0.72	0.72	<0.72	0.72	9243097
Ethyl Acetate	ug/m3	4.1	3.6	5.2	3.6	4.7	3.6	9243097
1,1-Dichloroethylene	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9243097
cis-1,2-Dichloroethylene	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9243097
trans-1,2-Dichloroethylene	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9243097
Methylene Chloride(Dichloromethane)	ug/m3	<2.1	2.1	<2.1	2.1	<2.1	2.1	9243097
Chloroform	ug/m3	<0.49	0.49	1.77	0.49	<0.49	0.49	9243097
Carbon Tetrachloride	ug/m3	<0.63	0.63	<0.63	0.63	<0.63	0.63	9243097
1,1-Dichloroethane	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9243097
1,2-Dichloroethane	ug/m3	<0.40	0.40	<0.40	0.40	<0.40	0.40	9243097
Ethylene Dibromide	ug/m3	<0.77	0.77	<0.77	0.77	<0.77	0.77	9243097
1,1,1-Trichloroethane	ug/m3	<0.55	0.55	<0.55	0.55	<0.55	0.55	9243097
1,1,2-Trichloroethane	ug/m3	<0.55	0.55	<0.55	0.55	<0.55	0.55	9243097
1,1,2,2-Tetrachloroethane	ug/m3	<0.69	0.69	<0.69	0.69	<0.69	0.69	9243097
cis-1,3-Dichloropropene	ug/m3	<0.45	0.45	<0.45	0.45	<0.45	0.45	9243097
trans-1,3-Dichloropropene	ug/m3	<0.45	0.45	<0.45	0.45	<0.45	0.45	9243097
1,2-Dichloropropane	ug/m3	<0.46	0.46	<0.46	0.46	<0.46	0.46	9243097

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		YMC925		YMC926		YMC927		
Sampling Date		2024/02/26 11:00		2024/02/26 11:30		2024/02/26 12:15		
COC Number		38421		38421		38421		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Bromomethane	ug/m3	<0.39	0.39	<0.39	0.39	<0.39	0.39	9243097
Bromoform	ug/m3	<2.1	2.1	<2.1	2.1	<2.1	2.1	9243097
Bromodichloromethane	ug/m3	<1.3	1.3	<1.3	1.3	<1.3	1.3	9243097
Dibromochloromethane	ug/m3	<1.7	1.7	<1.7	1.7	<1.7	1.7	9243097
Trichloroethylene	ug/m3	<0.54	0.54	<0.54	0.54	<0.54	0.54	9243097
Tetrachloroethylene	ug/m3	<0.68	0.68	<0.68	0.68	<0.68	0.68	9243097
Benzene	ug/m3	0.54	0.32	0.47	0.32	0.68	0.32	9243097
Toluene	ug/m3	2.96	0.38	3.87	0.38	3.44	0.38	9243097
Ethylbenzene	ug/m3	0.59	0.43	0.74	0.43	0.65	0.43	9243097
p+m-Xylene	ug/m3	2.10	0.87	2.74	0.87	2.33	0.87	9243097
o-Xylene	ug/m3	0.77	0.43	0.97	0.43	0.82	0.43	9243097
Styrene	ug/m3	<0.43	0.43	<0.43	0.43	<0.43	0.43	9243097
4-ethyltoluene	ug/m3	<2.5	2.5	<2.5	2.5	<2.5	2.5	9243097
1,3,5-Trimethylbenzene	ug/m3	<2.5	2.5	<2.5	2.5	<2.5	2.5	9243097
1,2,4-Trimethylbenzene	ug/m3	<2.5	2.5	<2.5	2.5	<2.5	2.5	9243097
Chlorobenzene	ug/m3	<0.46	0.46	<0.46	0.46	<0.46	0.46	9243097
Benzyl chloride	ug/m3	<2.6	2.6	<2.6	2.6	<2.6	2.6	9243097
1,3-Dichlorobenzene	ug/m3	<2.4	2.4	<2.4	2.4	<2.4	2.4	9243097
1,4-Dichlorobenzene	ug/m3	<0.60	0.60	<0.60	0.60	<0.60	0.60	9243097
1,2-Dichlorobenzene	ug/m3	<0.60	0.60	<0.60	0.60	<0.60	0.60	9243097
1,2,4-Trichlorobenzene	ug/m3	<3.7	3.7	<3.7	3.7	<3.7	3.7	9243097
Hexachlorobutadiene	ug/m3	<5.3	5.3	<5.3	5.3	<5.3	5.3	9243097
Hexane	ug/m3	<0.70	0.70	<0.70	0.70	<0.70	0.70	9243097
Heptane	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	9243097
Cyclohexane	ug/m3	<0.69	0.69	<0.69	0.69	<0.69	0.69	9243097
Tetrahydrofuran	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	9243097
1,4-Dioxane	ug/m3	<3.6	3.6	<3.6	3.6	<3.6	3.6	9243097
Naphthalene	ug/m3	<1.0	1.0	<1.0	1.0	<1.0	1.0	9243097
Total Xylenes	ug/m3	2.9	1.3	3.7	1.3	3.2	1.3	9243097
1,1,1,2-Tetrachloroethane	ug/m3	<0.69	0.69	<0.69	0.69	<0.69	0.69	9243097
Vinyl Bromide	ug/m3	<0.87	0.87	<0.87	0.87	<0.87	0.87	9243097
Propene	ug/m3	<1.7	1.7	<0.86	0.86	<1.4	1.4	9243097

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Bureau Veritas Job #: C457768
Report Date: 2024/03/11

WSP Canada Inc.
Client Project #: CA-GLD-22578520
Site Location: KPL-ORILLIA
Sampler Initials: BD

CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		YMC925		YMC926		YMC927		
Sampling Date		2024/02/26 11:00		2024/02/26 11:30		2024/02/26 12:15		
COC Number		38421		38421		38421		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
2,2,4-Trimethylpentane	ug/m3	<0.93	0.93	<0.93	0.93	<0.93	0.93	9243097
Carbon Disulfide	ug/m3	<1.6	1.6	<1.6	1.6	<1.6	1.6	9243097
Vinyl Acetate	ug/m3	<0.70	0.70	<0.70	0.70	<0.70	0.70	9243097

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Bureau Veritas Job #: C457768
Report Date: 2024/03/11

WSP Canada Inc.
Client Project #: CA-GLD-22578520
Site Location: KPL-ORILLIA
Sampler Initials: BD

TEST SUMMARY

Bureau Veritas ID: YMC925 **Collected:** 2024/02/26
Sample ID: GVP1 **Shipped:**
Matrix: Tedlar Bag **Received:** 2024/02/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	9243471	N/A	2024/02/27	Satvinder Bhathal
Light Hydrocarbons	GC/FID	9243726	N/A	2024/02/27	Iqbal Hasan
Matrix Gases	GC/TCD	9243730	N/A	2024/02/27	Iqbal Hasan
Volatile Organics in Air (ug/m3)	GC/MS	9243097	N/A	2024/02/27	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	9242535	N/A	2024/02/27	Pratima Patel

Bureau Veritas ID: YMC925 Dup **Collected:** 2024/02/26
Sample ID: GVP1 **Shipped:**
Matrix: Tedlar Bag **Received:** 2024/02/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Light Hydrocarbons	GC/FID	9243726	N/A	2024/02/27	Iqbal Hasan
Matrix Gases	GC/TCD	9243730	N/A	2024/02/27	Iqbal Hasan

Bureau Veritas ID: YMC926 **Collected:** 2024/02/26
Sample ID: GVP2 **Shipped:**
Matrix: Tedlar Bag **Received:** 2024/02/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	9243471	N/A	2024/02/27	Satvinder Bhathal
Light Hydrocarbons	GC/FID	9243726	N/A	2024/02/27	Iqbal Hasan
Matrix Gases	GC/TCD	9243730	N/A	2024/02/27	Iqbal Hasan
Volatile Organics in Air (ug/m3)	GC/MS	9243097	N/A	2024/02/27	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	9242535	N/A	2024/02/27	Pratima Patel

Bureau Veritas ID: YMC927 **Collected:** 2024/02/26
Sample ID: GVP3 **Shipped:**
Matrix: Tedlar Bag **Received:** 2024/02/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	9243471	N/A	2024/02/27	Satvinder Bhathal
Light Hydrocarbons	GC/FID	9243726	N/A	2024/02/27	Iqbal Hasan
Matrix Gases	GC/TCD	9243730	N/A	2024/02/27	Iqbal Hasan
Volatile Organics in Air (ug/m3)	GC/MS	9243097	N/A	2024/02/27	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	9242535	N/A	2024/02/27	Pratima Patel

Bureau Veritas ID: YMC927 Dup **Collected:** 2024/02/26
Sample ID: GVP3 **Shipped:**
Matrix: Tedlar Bag **Received:** 2024/02/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	9243471	N/A	2024/02/27	Satvinder Bhathal

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GENERAL COMMENTS

Matrix Gas Analysis: Results normalized to 100% dry volume.

Sample YMC925 [GVP1] : Increased DL for propene due to interference from propane.

Sample YMC927 [GVP3] : Increased DL for propene due to interference from propane.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9242535	TIM	Spiked Blank	Bromochloromethane	2024/02/27		103	%	60 - 140
			D5-Chlorobenzene	2024/02/27		102	%	60 - 140
			Difluorobenzene	2024/02/27		103	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2024/02/27		82	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2024/02/27		83	%	70 - 130
			Chloromethane	2024/02/27		70	%	70 - 130
			Vinyl Chloride	2024/02/27		81	%	70 - 130
			Chloroethane	2024/02/27		81	%	70 - 130
			1,3-Butadiene	2024/02/27		81	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2024/02/27		85	%	70 - 130
			Ethanol (ethyl alcohol)	2024/02/27		63 (1)	%	70 - 130
			Trichlorotrifluoroethane	2024/02/27		91	%	70 - 130
			2-propanol	2024/02/27		81	%	70 - 130
			2-Propanone	2024/02/27		74	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2024/02/27		82	%	70 - 130
			Methyl Isobutyl Ketone	2024/02/27		87	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2024/02/27		85	%	70 - 130
			Methyl t-butyl ether (MTBE)	2024/02/27		78	%	70 - 130
			Ethyl Acetate	2024/02/27		82	%	70 - 130
			1,1-Dichloroethylene	2024/02/27		86	%	70 - 130
			cis-1,2-Dichloroethylene	2024/02/27		86	%	70 - 130
			trans-1,2-Dichloroethylene	2024/02/27		87	%	70 - 130
			Methylene Chloride(Dichloromethane)	2024/02/27		85	%	70 - 130
			Chloroform	2024/02/27		96	%	70 - 130
			Carbon Tetrachloride	2024/02/27		100	%	70 - 130
			1,1-Dichloroethane	2024/02/27		86	%	70 - 130
			1,2-Dichloroethane	2024/02/27		93	%	70 - 130
			Ethylene Dibromide	2024/02/27		99	%	70 - 130
			1,1,1-Trichloroethane	2024/02/27		96	%	70 - 130
			1,1,2-Trichloroethane	2024/02/27		97	%	70 - 130
			1,1,2,2-Tetrachloroethane	2024/02/27		95	%	70 - 130
			cis-1,3-Dichloropropene	2024/02/27		98	%	70 - 130
			trans-1,3-Dichloropropene	2024/02/27		104	%	70 - 130
			1,2-Dichloropropane	2024/02/27		94	%	70 - 130
			Bromomethane	2024/02/27		85	%	70 - 130
			Bromoform	2024/02/27		100	%	70 - 130
			Bromodichloromethane	2024/02/27		93	%	70 - 130
			Dibromochloromethane	2024/02/27		99	%	70 - 130
			Trichloroethylene	2024/02/27		104	%	70 - 130
			Tetrachloroethylene	2024/02/27		104	%	70 - 130
			Benzene	2024/02/27		97	%	70 - 130
			Toluene	2024/02/27		97	%	70 - 130
			Ethylbenzene	2024/02/27		94	%	70 - 130
			p+m-Xylene	2024/02/27		95	%	70 - 130
			o-Xylene	2024/02/27		95	%	70 - 130
			Styrene	2024/02/27		107	%	70 - 130
			4-ethyltoluene	2024/02/27		98	%	70 - 130
			1,3,5-Trimethylbenzene	2024/02/27		97	%	70 - 130
			1,2,4-Trimethylbenzene	2024/02/27		97	%	70 - 130
			Chlorobenzene	2024/02/27		99	%	70 - 130
			Benzyl chloride	2024/02/27		107	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,3-Dichlorobenzene	2024/02/27		96	%	70 - 130
			1,4-Dichlorobenzene	2024/02/27		101	%	70 - 130
			1,2-Dichlorobenzene	2024/02/27		96	%	70 - 130
			1,2,4-Trichlorobenzene	2024/02/27		106	%	70 - 130
			Hexachlorobutadiene	2024/02/27		84	%	70 - 130
			Hexane	2024/02/27		85	%	70 - 130
			Heptane	2024/02/27		94	%	70 - 130
			Cyclohexane	2024/02/27		93	%	70 - 130
			Tetrahydrofuran	2024/02/27		91	%	70 - 130
			1,4-Dioxane	2024/02/27		101	%	70 - 130
			Naphthalene	2024/02/27		114	%	70 - 130
			Total Xylenes	2024/02/27		95	%	70 - 130
			1,1,1,2-Tetrachloroethane	2024/02/27		98	%	70 - 130
			Vinyl Bromide	2024/02/27		80	%	70 - 130
			Propene	2024/02/27		74	%	70 - 130
			2,2,4-Trimethylpentane	2024/02/27		96	%	70 - 130
			Carbon Disulfide	2024/02/27		90	%	70 - 130
			Vinyl Acetate	2024/02/27		87	%	70 - 130
9242535	TIM	Method Blank	Bromochloromethane	2024/02/27		91	%	60 - 140
			D5-Chlorobenzene	2024/02/27		87	%	60 - 140
			Difluorobenzene	2024/02/27		98	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2024/02/27	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2024/02/27	<0.17		ppbv	
			Chloromethane	2024/02/27	<0.30		ppbv	
			Vinyl Chloride	2024/02/27	<0.10		ppbv	
			Chloroethane	2024/02/27	<0.30		ppbv	
			1,3-Butadiene	2024/02/27	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2024/02/27	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2024/02/27	<1.0		ppbv	
			Trichlorotrifluoroethane	2024/02/27	<0.15		ppbv	
			2-propanol	2024/02/27	<1.0		ppbv	
			2-Propanone	2024/02/27	<0.60		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2024/02/27	<0.20		ppbv	
			Methyl Isobutyl Ketone	2024/02/27	<0.20		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2024/02/27	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2024/02/27	<0.20		ppbv	
			Ethyl Acetate	2024/02/27	<1.0		ppbv	
			1,1-Dichloroethylene	2024/02/27	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2024/02/27	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2024/02/27	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2024/02/27	<0.60		ppbv	
			Chloroform	2024/02/27	<0.10		ppbv	
			Carbon Tetrachloride	2024/02/27	<0.10		ppbv	
			1,1-Dichloroethane	2024/02/27	<0.10		ppbv	
			1,2-Dichloroethane	2024/02/27	<0.10		ppbv	
			Ethylene Dibromide	2024/02/27	<0.10		ppbv	
			1,1,1-Trichloroethane	2024/02/27	<0.10		ppbv	
			1,1,2-Trichloroethane	2024/02/27	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2024/02/27	<0.10		ppbv	
			cis-1,3-Dichloropropene	2024/02/27	<0.10		ppbv	
			trans-1,3-Dichloropropene	2024/02/27	<0.10		ppbv	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichloropropane	2024/02/27	<0.10		ppbv	
			Bromomethane	2024/02/27	<0.10		ppbv	
			Bromoform	2024/02/27	<0.20		ppbv	
			Bromodichloromethane	2024/02/27	<0.20		ppbv	
			Dibromochloromethane	2024/02/27	<0.20		ppbv	
			Trichloroethylene	2024/02/27	<0.10		ppbv	
			Tetrachloroethylene	2024/02/27	<0.10		ppbv	
			Benzene	2024/02/27	<0.10		ppbv	
			Toluene	2024/02/27	<0.10		ppbv	
			Ethylbenzene	2024/02/27	<0.10		ppbv	
			p+m-Xylene	2024/02/27	<0.20		ppbv	
			o-Xylene	2024/02/27	<0.10		ppbv	
			Styrene	2024/02/27	<0.10		ppbv	
			4-ethyltoluene	2024/02/27	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2024/02/27	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2024/02/27	<0.50		ppbv	
			Chlorobenzene	2024/02/27	<0.10		ppbv	
			Benzyl chloride	2024/02/27	<0.50		ppbv	
			1,3-Dichlorobenzene	2024/02/27	<0.40		ppbv	
			1,4-Dichlorobenzene	2024/02/27	<0.10		ppbv	
			1,2-Dichlorobenzene	2024/02/27	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2024/02/27	<0.50		ppbv	
			Hexachlorobutadiene	2024/02/27	<0.50		ppbv	
			Hexane	2024/02/27	<0.20		ppbv	
			Heptane	2024/02/27	<0.30		ppbv	
			Cyclohexane	2024/02/27	<0.20		ppbv	
			Tetrahydrofuran	2024/02/27	<0.40		ppbv	
			1,4-Dioxane	2024/02/27	<1.0		ppbv	
			Naphthalene	2024/02/27	<0.20		ppbv	
			Total Xylenes	2024/02/27	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2024/02/27	<0.10		ppbv	
			Vinyl Bromide	2024/02/27	<0.20		ppbv	
			Propene	2024/02/27	<0.50		ppbv	
			2,2,4-Trimethylpentane	2024/02/27	<0.20		ppbv	
			Carbon Disulfide	2024/02/27	<0.50		ppbv	
			Vinyl Acetate	2024/02/27	<0.20		ppbv	
9243097	ASC	RPD	Vinyl Chloride	2024/03/11	NC		%	25
			1,1-Dichloroethylene	2024/03/11	NC		%	25
			cis-1,2-Dichloroethylene	2024/03/11	NC		%	25
			trans-1,2-Dichloroethylene	2024/03/11	NC		%	25
			Trichloroethylene	2024/03/11	NC		%	25
			Tetrachloroethylene	2024/03/11	NC		%	25
9243471	SB1	Method Blank	Hydrogen sulfide	2024/02/27	<0.4		ppmv	
9243471	SB1	RPD [YMC927-01]	Hydrogen sulfide	2024/02/27	NC		%	20
9243726	IH0	Method Blank	Methane	2024/02/27	<2		ppm	
9243726	IH0	RPD [YMC925-01]	Methane	2024/02/27	0.16		%	30
9243730	IH0	Method Blank	Oxygen	2024/02/27	<0.1		% v/v	
			Carbon Monoxide	2024/02/27	<0.1		% v/v	
			Carbon Dioxide	2024/02/27	<0.1		% v/v	
9243730	IH0	RPD [YMC925-01]	Oxygen	2024/02/27	0.29		%	20
			Carbon Monoxide	2024/02/27	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Carbon Dioxide	2024/02/27	1.7		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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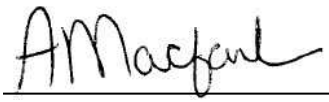
Bureau Veritas Job #: C457768
Report Date: 2024/03/11

WSP Canada Inc.
Client Project #: CA-GLD-22578520
Site Location: KPL-ORILLIA
Sampler Initials: BD

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anke Macfarlane, Laboratory Manager, VOC

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

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Chain of Custody Form - AIR

38421

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CAM FCD-01302 /3

Page 1 of 1

CLIENT INFORMATION

Company Name: WSP
Project Manager: Joel Robinson
e-mail: Joel.Robinson@wsp.com
Address: 121 Commerce Park Drive, Unit L, Barrie, ON, L4N 8X1

SECTION

Phone: 705-722-4492 Fax: —
Sampled by: Brian Drake

ANALYSIS REQUESTED

Field Sample ID	Total Volume Sampled	Flow Rate	Collection Date	Sample Collection Time	Methane	Hydrogen Sulphide	Oxygen	Carbon Monoxide	Carbon Dioxide	VOC's
GVP1	2L	0.5L/m	2/26/24	11:00am	X	X	X	X	X	X
GVP2	2L	0.5L/m	2/26/24	11:30am	X	X	X	X	X	X
GVP3	2L	0.5L/m	2/26/24	12:15pm	X	X	X	X	X	X

27-Feb-24 09:10
Cristina (Maria) Bacchus
C457768
NPA AIR-RmTmp

TAT Requirement

STD 10 Business day ☒
Rush 5 Business day * ☐
Rush 2 Business day * ☐
* need approval from Bureau Veritas

PROJECT INFORMATION

Project #: CA-GLD-22578529
Name: KPL-Orillia
PO #:
BV Quote #:
BV Contact:

REPORTING REQUIREMENTS

Summary Report only ☑
EDD ☑
Regulation 153/04

Notes

Please note if these samples are "Industrial Hygiene" samples
If submitting dustfall samples, please indicate the diameter of the jar opening in cm.

PROJECT SPECIFIC COMMENTS

Client Signature:
Affiliation: Field Technician
Date/Time: Feb. 26, 2024

Received by: Amri ANERS
Affiliation:
Date/Time: 2024/02/27 0904

COC-1031 (11/2019)

TESTMARK Laboratories Ltd.
Committed to Quality and Service

CERTIFICATE OF ANALYSIS

Client:	Hannah Curry	Work Order Number:	551638
Company:	City of Orillia - Waste Diversion Site	PO #:	84138
Address:	40 Kitchener St. Orillia, ON, L3V 6Z9	Regulation:	Information not provided
		Project #:	Fall WDS Sampling KP
Phone:	(705) 325-2394	DWS #:	
Email:	hcurry@orillia.ca	Sampled By:	Hannah Curry
Date Order Received:	9/27/2024	Analysis Started:	9/27/2024
Arrival Temperature:	13.1 C	Analysis Completed:	10/9/2024

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH28-I(4643)	2061019	Ground Water	None		9/23/2024	12:00 PM
BH28-II(4644)	2061020	Ground Water	None		9/23/2024	12:15 PM
OW1-I(4645)	2061021	Ground Water	None		9/24/2024	1:10 PM
OW1-II(4646)	2061022	Ground Water	None		9/24/2024	1:25 PM
OW1-III(4647)	2061023	Ground Water	None		9/24/2024	1:50 PM
OW2-I(4648)	2061024	Ground Water	None		9/24/2024	12:00 PM
OW2-II(4649)	2061025	Ground Water	None		9/24/2024	12:15 PM
OW3(4650)	2061026	Ground Water	None		9/23/2024	2:45 PM
OW4-I (4651)	2061027	Ground Water	None		9/23/2024	2:05 PM
OW4-II (4652)	2061028	Ground Water	None		9/23/2024	2:20 PM
OW5-I (4653)	2061029	Ground Water	None		9/23/2024	10:10 AM
OW6-I (4654)	2061030	Ground Water	None		9/24/2024	3:05 PM
OW6-II (4655)	2061031	Ground Water	None		9/24/2024	3:20 PM
OW7 (4656)	2061032	Ground Water	None		9/23/2024	9:00 AM
OW8 (4657)	2061033	Ground Water	None		9/24/2024	11:15 AM
OW9-I (4658)	2061034	Ground Water	None		9/23/2024	11:35 AM
OW9-II (4659)	2061035	Ground Water	None		9/23/2024	11:10 AM

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
Duplicate OW2-IID (4660)	2061036	Ground Water	None		9/24/2024	12:15 PM
Duplicate OW504-I (4661)	2061037	Ground Water	None		9/23/2024	2:05 PM

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Alkalinity (A1.0)	Garson	Determination of Alkalinity by Titration	Modified from APHA-2320B
Ammonia Water (A42)	Garson	Determination of Ammonia/Ammonium in Water	Modified from EPA 350.1
Ammonium Water (A42.3)	Garson	Calculation of Ammonium in Water	Modified from APHA 4500
Anions Water (mg/L by IC) (A5)	Garson	Determination of Anions in Water by Ion Chromatography	Modified from SW846-9056A
Carbonate (A94)	Garson	Determination of Carbonate and Bi-Carbonate	Modified from APHA-2320
Conductivity of Water (A12)	Garson	Determination of Conductivity in Water at 25°C	Modified from SM 2510 B
DIC Water (A55)	Mississauga	Determination of Dissolved Inorganic Carbon in Water	Modified from SM-5310 C
DOC Water (A55.1)	Mississauga	Determination of Dissolved Organic Carbon in Water	Modified from SM-5310 C
Field pH (R112)	Mississauga	Client Supplied Field Determination of pH of Water	Field Test
Field Temp (R113)	Mississauga	Client Supplied Field Determination of Temperature of Water	Field Test
ICPMS Dis. Water (A13.3)	Garson	Determination of Dissolved Metals in Water by ICP/MS -> Lab-Filtered	Modified from SW846-6020A
ICPMS Reg. Water (A13)	Garson	Determination of Metals in Water by ICP/MS	Modified from SW846-6020A
Ion Balance (A91)	Garson	Calculation of Ion Balance	Modified from APHA-1030E
OP Water (A23.1)	Mississauga	Determination of Ortho-Phosphate in Water.	Modified from EPA 365.3 and ESS 310.2.
Organic Nitrogen (A58)	Garson	Determination of Organic Nitrogen	Modified from APHA-4500
pH of Water (A2.0)	Garson	Determination of Water pH by Ion Selective Electrode	Modified from APHA-4500H+ B
Phenols 4AAP (T38)	Mississauga	Determination of Total Phenols by 4AAP	Modified from APHA-5530
Reg. Hardness (A13)	Garson	Determination of Total Hardness	Modified from APHA-2340B
TKN Water Dig. (A58)	Garson	Determination of Total Kjeldahl Nitrogen in Waters with Block Digestion.	Modified from SM-4500 NORG-D
TP Water (A23.2)	Garson	Determination of Total Phosphorus in Water.	Modified from EPA 365.3 and ESS 310.2,
Un-Ionized NH3 (A42.4)	Garson	Calculation of Un-Ionized Ammonia, based on Client Field pH and Temperature	Modified from APHA-4500
VOC Water (A14)	Mississauga	Determination of Volatile Organic Compounds in Water by P&T/GC/MS	Modified from EPA SW846-8260 B

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

This report has been approved by:

Brad Halvorson, B.Sc.
Laboratory Director

WORK ORDER RESULTS

Sample Description	BH28 - I(4643)		BH28 - II(4644)		OW1 - I(4645)		OW1 - II(4646)		
Sample Date	9/23/2024 12:00 PM		9/23/2024 12:15 PM		9/24/2024 1:10 PM		9/24/2024 1:25 PM		
Lab ID	2061019		2061020		2061021		2061022		
Anions	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Chloride	110.0	0.4*	23.9	0.6*	94.3	0.8*	81.0	0.6*	mg/L
Nitrate (as N)	<0.1	0.1*	0.54	0.15*	<0.2	0.2*	<0.15	0.15*	mg/L
Nitrite (as N)	<0.1	0.1*	<0.15	0.15*	<0.2	0.2*	<0.15	0.15*	mg/L
Sulphate	10	1*	3.6	1.5*	<2	2*	<1.5	1.5*	mg/L

Sample Description	OW1 - III(4647)		OW2 - I(4648)		OW2 - II(4649)		OW3(4650)		
Sample Date	9/24/2024 1:50 PM		9/24/2024 12:00 PM		9/24/2024 12:15 PM		9/23/2024 2:45 PM		
Lab ID	2061023		2061024		2061025		2061026		
Anions	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Chloride	96.2	0.6*	114	1*	43.8	0.8*	28.8	0.4*	mg/L
Nitrate (as N)	<0.15	0.15*	<0.25	0.25*	<0.2	0.2*	<0.1	0.1*	mg/L
Nitrite (as N)	<0.15	0.15*	<0.25	0.25*	<0.2	0.2*	<0.1	0.1*	mg/L
Sulphate	<1.5	1.5*	4.9	2.5*	<2	2*	<1	1*	mg/L

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	OW4 - I (4651)		OW4 - II (4652)		OW5 - I (4653)		OW6 - I (4654)		
Sample Date	9/23/2024 2:05 PM		9/23/2024 2:20 PM		9/23/2024 10:10 AM		9/24/2024 3:05 PM		
Lab ID	2061027		2061028		2061029		2061030		
Anions	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Chloride	12.2	0.4*	8.3	0.2	159.0	0.2	12.3	0.6*	mg/L
Nitrate (as N)	<0.1	0.1*	<0.05	0.05	<0.05	0.05	<0.15	0.15*	mg/L
Nitrite (as N)	<0.1	0.1*	<0.05	0.05	<0.05	0.05	<0.15	0.15*	mg/L
Sulphate	<1	1*	<0.5	0.5	16.2	0.5	<1.5	1.5*	mg/L

Sample Description	OW6 - II (4655)		OW7 (4656)		OW8 (4657)		OW9 - I (4658)		
Sample Date	9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 11:15 AM		9/23/2024 11:35 AM		
Lab ID	2061031		2061032		2061033		2061034		
Anions	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Chloride	8.2	0.2	46.1	0.6*	167.0	0.6*	167.0	0.8*	mg/L
Nitrate (as N)	<0.05	0.05	<0.15	0.15*	<0.15	0.15*	<0.2	0.2*	mg/L
Nitrite (as N)	<0.05	0.05	<0.15	0.15*	<0.15	0.15*	<0.2	0.2*	mg/L
Sulphate	4.6	0.5	55.1	1.5*	2.1	1.5*	207	2*	mg/L

Sample Description	OW9 - II (4659)		Duplicate OW2 - IID (4660)		Duplicate OW504 - I (4661)		
Sample Date	9/23/2024 11:10 AM		9/24/2024 12:15 PM		9/23/2024 2:05 PM		
Lab ID	2061035		2061036		2061037		
Anions	Result	MDL	Result	MDL	Result	MDL	Units
Chloride	422	2*	45.8	0.2	12.3	0.4*	mg/L
Nitrate (as N)	7.9	0.5*	<0.05	0.05	<0.1	0.1*	mg/L
Nitrite (as N)	<0.5	0.5*	<0.05	0.05	<0.1	0.1*	mg/L
Sulphate	111	5*	<0.5	0.5	<1	1*	mg/L

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	BH28 - I(4643)		BH28 - II(4644)		OW1 - I(4645)		OW1 - II(4646)		
Sample Date	9/23/2024 12:00 PM		9/23/2024 12:15 PM		9/24/2024 1:10 PM		9/24/2024 1:25 PM		
Lab ID	2061019		2061020		2061021		2061022		
Field Parameters	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**
Field pH	6.7	N/A	6.82	N/A	6.58	N/A	6.55	N/A	pH
Field Temp	10.7	N/A	15.1	N/A	8.9	N/A	8.9	N/A	°C

Sample Description	OW1 - III(4647)		OW2 - I(4648)		OW2 - II(4649)		OW3(4650)		
Sample Date	9/24/2024 1:50 PM		9/24/2024 12:00 PM		9/24/2024 12:15 PM		9/23/2024 2:45 PM		
Lab ID	2061023		2061024		2061025		2061026		
Field Parameters	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**
Field pH	6.59	N/A	6.57	N/A	6.57	N/A	6.55	N/A	pH
Field Temp	11.5	N/A	9.3	N/A	9.4	N/A	11.9	N/A	°C

Sample Description	OW4 - I (4651)		OW4 - II (4652)		OW5 - I (4653)		OW6 - I (4654)		
Sample Date	9/23/2024 2:05 PM		9/23/2024 2:20 PM		9/23/2024 10:10 AM		9/24/2024 3:05 PM		
Lab ID	2061027		2061028		2061029		2061030		
Field Parameters	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**
Field pH	6.52	N/A	6.72	N/A	6.46	N/A	6.5	N/A	pH
Field Temp	9.9	N/A	13.9	N/A	10.3	N/A	9.4	N/A	°C

Sample Description	OW6 - II (4655)		OW7 (4656)		OW8 (4657)		OW9 - I (4658)		
Sample Date	9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 11:15 AM		9/23/2024 11:35 AM		
Lab ID	2061031		2061032		2061033		2061034		
Field Parameters	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**
Field pH	6.42	N/A	6.48	N/A	6.73	N/A	6.73	N/A	pH
Field Temp	12.8	N/A	9.9	N/A	13.2	N/A	9.4	N/A	°C

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City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	OW9 - II (4659)		Duplicate OW2 - IID (4660)		Duplicate OW504 - I (4661)		
Sample Date	9/23/2024 11:10 AM		9/24/2024 12:15 PM		9/23/2024 2:05 PM		
Lab ID	2061035		2061036		2061037		
Field Parameters	Result	MDL	Result	MDL	Result	MDL	Units
Field pH	6.65	N/A	6.57	N/A	6.52	N/A	pH
Field Temp	13.5	N/A	9.4	N/A	9.9	N/A	°C

Sample Description	BH28 - I(4643)		BH28 - II(4644)		OW1 - I(4645)		OW1 - II(4646)		
Sample Date	9/23/2024 12:00 PM		9/23/2024 12:15 PM		9/24/2024 1:10 PM		9/24/2024 1:25 PM		
Lab ID	2061019		2061020		2061021		2061022		
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Ammonia (as N)	3.88	0.01	40.3	0.2*	19.5	0.1*	21.3	0.1*	mg/L
Ammonium (as N) (Calc.)	3.88	0.01	40.20	0.01	19.50	0.01	21.30	0.01	mg/L
Anion Sum (Calc.)	11.5	N/A	10.3	N/A	13.8	N/A	12.8	N/A	meq
Bicarbonate (Calc.)	497	1	584	1	681	1	642	1	mg/L as CaCO3
Carbonate (Calc.)	<1	1	<1	1	<1	1	<1	1	mg/L as CaCO3
Cation Sum (Calc.)	12.7	N/A	11.8	N/A	15.4	N/A	13.8	N/A	meq
Conductivity	1200	1	1170	1	1480	1	1380	1	µS/cm
Dissolved Inorganic Carbon	122	4*	163	4*	178	4*	159	4*	mg/L
Dissolved Organic Carbon	9.1	0.4	21.1	0.4	16.3	0.4	13.6	0.4	mg/L
Ion Balance (Calc.)	4.96	N/A	6.79	N/A	5.48	N/A	3.76	N/A	%
Organic Nitrogen (as N) (Calc.)	2.1	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	mg/L
Orthophosphate (as P)	<0.005	0.005	1.020	0.005	0.005	0.005	<0.005	0.005	mg/L
pH	6.84	N/A	6.94	N/A	6.59	N/A	6.67	N/A	pH
Total Alkalinity	497	2	584	2	681	2	642	2	mg/L as CaCO3

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City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	BH28 - I(4643)		BH28 - II(4644)		OW1 - I(4645)		OW1 - II(4646)		
Sample Date	9/23/2024 12:00 PM		9/23/2024 12:15 PM		9/24/2024 1:10 PM		9/24/2024 1:25 PM		
Lab ID	2061019		2061020		2061021		2061022		
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Total Hardness (as CaCO3) (Calc.)	579.0	0.1	470.0	0.1	611.0	0.1	548.0	0.1	mg/L
Total Kjeldahl Nitrogen	6.0	0.2*	36	3*	18	3*	18.1	0.2*	mg/L
Total Phenols	0.0011	0.0004	0.0010	0.0004	0.0010	0.0004	0.0012	0.0004	mg/L
Total Phosphorus (as P)	<0.002	0.002	5.07	0.03*	0.084	0.002	0.007	0.002	mg/L
Un-Ionized Ammonia (Calc.)	0.004	0.002	0.073	0.002	0.013	0.002	0.013	0.002	mg/L

Sample Description	OW1 - III(4647)		OW2 - I(4648)		OW2 - II(4649)		OW3(4650)		
Sample Date	9/24/2024 1:50 PM		9/24/2024 12:00 PM		9/24/2024 12:15 PM		9/23/2024 2:45 PM		
Lab ID	2061023		2061024		2061025		2061026		
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Ammonia (as N)	2.51	0.01	0.05	0.01	31.9	0.1*	14.9	0.1*	mg/L
Ammonium (as N) (Calc.)	2.51	0.01	0.05	0.01	31.90	0.01	14.90	0.01	mg/L
Anion Sum (Calc.)	13.9	N/A	20.6	N/A	13.1	N/A	8.95	N/A	meq
Bicarbonate (Calc.)	681	1	1050	1	725	1	496	1	mg/L as CaCO3
Carbonate (Calc.)	<1	1	<1	1	<1	1	<1	1	mg/L as CaCO3
Cation Sum (Calc.)	15.3	N/A	24.8	N/A	13.9	N/A	9.69	N/A	meq
Conductivity	1410	1	1990	1	1390	1	1000	1	µS/cm
Dissolved Inorganic Carbon	171	4*	283	4*	193	4*	122	4*	mg/L
Dissolved Organic Carbon	10.1	0.4	15.5	0.4	18.4	0.4	14.9	0.4	mg/L
Ion Balance (Calc.)	4.79	N/A	9.25	N/A	2.96	N/A	3.97	N/A	%
Organic Nitrogen (as N) (Calc.)	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	mg/L
Orthophosphate (as P)	0.033	0.005	<0.005	0.005	<0.005	0.005	<0.005	0.005	mg/L

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Sample Description	OW1 - III(4647)		OW2 - I(4648)		OW2 - II(4649)		OW3(4650)		
Sample Date	9/24/2024 1:50 PM		9/24/2024 12:00 PM		9/24/2024 12:15 PM		9/23/2024 2:45 PM		
Lab ID	2061023		2061024		2061025		2061026		
General Chemistry	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**
pH	6.72	N/A	6.82	N/A	6.71	N/A	6.86	N/A	pH
Total Alkalinity	681	2	1050	2	725	2	496	2	mg/L as CaCO3
Total Hardness (as CaCO3) (Calc.)	688.0	0.1	1160.0	0.1	599.0	0.1	459.0	0.1	mg/L
Total Kjeldahl Nitrogen	2.6	0.2*	<0.2	0.2*	51	3*	13.0	0.2*	mg/L
Total Phenols	0.0015	0.0004	0.0010	0.0004	0.0012	0.0004	0.0015	0.0004	mg/L
Total Phosphorus (as P)	1.29	0.01*	0.722	0.004*	0.041	0.002	0.489	0.002	mg/L
Un-Ionized Ammonia (Calc.)	0.002	0.002	<0.002	0.002	0.021	0.002	0.011	0.002	mg/L

Sample Description	OW4 - I (4651)		OW4 - II (4652)		OW5 - I (4653)		OW6 - I (4654)		
Sample Date	9/23/2024 2:05 PM		9/23/2024 2:20 PM		9/23/2024 10:10 AM		9/24/2024 3:05 PM		
Lab ID	2061027		2061028		2061029		2061030		
General Chemistry	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**
Ammonia (as N)	1.23	0.01	0.96	0.01	0.52	0.01	30.1	0.2*	mg/L
Ammonium (as N) (Calc.)	1.23	0.01	0.96	0.01	0.52	0.01	30.10	0.01	mg/L
Anion Sum (Calc.)	9.53	N/A	5.07	N/A	15.9	N/A	11.9	N/A	meq
Bicarbonate (Calc.)	560	1	295	1	678	1	706	1	mg/L as CaCO3
Carbonate (Calc.)	<1	1	<1	1	<1	1	<1	1	mg/L as CaCO3
Cation Sum (Calc.)	11.7	N/A	6.19	N/A	19	N/A	13.1	N/A	meq
Conductivity	1030	1	565	1	1610	1	1290	1	µS/cm
Dissolved Inorganic Carbon	143	4*	70	4*	166	4*	181	4*	mg/L
Dissolved Organic Carbon	14.2	0.4	8.4	0.4	10.2	0.4	13.5	0.4	mg/L
Ion Balance (Calc.)	10.2	N/A	9.95	N/A	8.88	N/A	4.8	N/A	%

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Sample Description	OW4 - I (4651)		OW4 - II (4652)		OW5 - I (4653)		OW6 - I (4654)		
Sample Date	9/23/2024 2:05 PM		9/23/2024 2:20 PM		9/23/2024 10:10 AM		9/24/2024 3:05 PM		
Lab ID	2061027		2061028		2061029		2061030		
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Organic Nitrogen (as N) (Calc.)	0.4	0.2	0.2	0.2	0.6	0.2	<0.2	0.2	mg/L
Orthophosphate (as P)	0.006	0.005	0.061	0.005	0.008	0.005	<0.005	0.005	mg/L
pH	6.72	N/A	7.12	N/A	6.87	N/A	6.6	N/A	pH
Total Alkalinity	560	2	295	2	678	2	706	2	mg/L as CaCO3
Total Hardness (as CaCO3) (Calc.)	813.0	0.1	319.0	0.1	1060.0	0.1	753.0	0.1	mg/L
Total Kjeldahl Nitrogen	1.6	0.2*	1.2	0.2*	1.1	0.2*	28.7	0.8*	mg/L
Total Phenols	0.0011	0.0004	0.0015	0.0004	0.0012	0.0004	0.0005	0.0004	mg/L
Total Phosphorus (as P)	0.450	0.002	0.135	0.002	0.665	0.004*	1.17	0.01*	mg/L
Un-Ionized Ammonia (Calc.)	<0.002	0.002	<0.002	0.002	<0.002	0.002	0.017	0.002	mg/L

Sample Description	OW6 - II (4655)		OW7 (4656)		OW8 (4657)		OW9 - I (4658)		
Sample Date	9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 11:15 AM		9/23/2024 11:35 AM		
Lab ID	2061031		2061032		2061033		2061034		
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Ammonia (as N)	24.8	0.1*	12.2	0.1*	3.78	0.01	77.4	0.2*	mg/L
Ammonium (as N) (Calc.)	24.80	0.01	12.20	0.01	3.78	0.01	77.30	0.01	mg/L
Anion Sum (Calc.)	13.7	N/A	11	N/A	11.5	N/A	21.5	N/A	meq
Bicarbonate (Calc.)	815	1	521	1	410	1	764	1	mg/L as CaCO3
Carbonate (Calc.)	<1	1	<1	1	<1	1	<1	1	mg/L as CaCO3
Cation Sum (Calc.)	15.2	N/A	11.6	N/A	12.1	N/A	18.5	N/A	meq
Conductivity	1420	1	1130	1	1210	1	2100	1	µS/cm
Dissolved Inorganic Carbon	214	4*	131	4*	98	4*	187	4*	mg/L

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Sample Description	OW6 - II (4655)		OW7 (4656)		OW8 (4657)		OW9 - I (4658)		
Sample Date	9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 11:15 AM		9/23/2024 11:35 AM		
Lab ID	2061031		2061032		2061033		2061034		
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Organic Carbon	14.7	0.4	9.5	0.4	5.9	0.4	14.8	0.4	mg/L
Ion Balance (Calc.)	5.19	N/A	2.65	N/A	2.54	N/A	-7.5	N/A	%
Organic Nitrogen (as N) (Calc.)	<0.2	0.2	<0.2	0.2	1.4	0.2	<0.2	0.2	mg/L
Orthophosphate (as P)	0.010	0.005	<0.005	0.005	0.006	0.005	0.030	0.005	mg/L
pH	6.52	N/A	6.59	N/A	6.79	N/A	7.04	N/A	pH
Total Alkalinity	815	2	521	2	410	2	765	2	mg/L as CaCO3
Total Hardness (as CaCO3) (Calc.)	1050.0	0.1	599.0	0.1	515.0	0.1	1210.0	0.1	mg/L
Total Kjeldahl Nitrogen	24.0	0.6*	12.2	0.8*	5.2	0.2*	75	1*	mg/L
Total Phenols	0.0026	0.0004	0.0019	0.0004	0.0018	0.0004	0.0016	0.0004	mg/L
Total Phosphorus (as P)	2.23	0.02*	0.096	0.002	0.150	0.002	0.331	0.002	mg/L
Un-Ionized Ammonia (Calc.)	0.015	0.002	0.007	0.002	0.005	0.002	0.074	0.002	mg/L

Sample Description	OW9 - II (4659)		Duplicate OW2 - IID (4660)		Duplicate OW504 - I (4661)		
Sample Date	9/23/2024 11:10 AM		9/24/2024 12:15 PM		9/23/2024 2:05 PM		
Lab ID	2061035		2061036		2061037		
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Units
Ammonia (as N)	0.18	0.01	30.8	0.2*	1.41	0.01	mg/L
Ammonium (as N) (Calc.)	0.18	0.01	30.80	0.01	1.41	0.01	mg/L
Anion Sum (Calc.)	23.7	N/A	13.2	N/A	9.4	N/A	meq
Bicarbonate (Calc.)	573	1	726	1	552	1	mg/L as CaCO3
Carbonate (Calc.)	<1	1	<1	1	<1	1	mg/L as CaCO3

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Sample Description	OW9 - II (4659)		Duplicate OW2 - IID (4660)		Duplicate OW504 - I (4661)		
Sample Date	9/23/2024 11:10 AM		9/24/2024 12:15 PM		9/23/2024 2:05 PM		
Lab ID	2061035		2061036		2061037		
General Chemistry	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**
Cation Sum (Calc.)	24.7	N/A	14	N/A	11.6	N/A	meq
Conductivity	2280	1	1390	1	1000	1	µS/cm
Dissolved Inorganic Carbon	140	4*	198	4*	136	4*	mg/L
Dissolved Organic Carbon	8.3	0.4	18.7	0.4	14.1	0.4	mg/L
Ion Balance (Calc.)	2.07	N/A	2.94	N/A	10.5	N/A	%
Organic Nitrogen (as N) (Calc.)	0.6	0.2	<0.2	0.2	0.5	0.2	mg/L
Orthophosphate (as P)	<0.005	0.005	<0.005	0.005	0.014	0.005	mg/L
pH	6.86	N/A	6.67	N/A	6.68	N/A	pH
Total Alkalinity	573	2	726	2	552	2	mg/L as CaCO3
Total Hardness (as CaCO3) (Calc.)	1010.0	0.1	587.0	0.1	775.0	0.1	mg/L
Total Kjeldahl Nitrogen	0.9	0.2*	60	4*	1.9	0.2*	mg/L
Total Phenols	0.0010	0.0004	0.0010	0.0004	0.0010	0.0004	mg/L
Total Phosphorus (as P)	0.134	0.002	0.026	0.002	0.312	0.002	mg/L
Un-Ionized Ammonia (Calc.)	<0.002	0.002	0.020	0.002	<0.002	0.002	mg/L

Sample Description	BH28 - I(4643)		BH28 - II(4644)		OW1 - I(4645)		OW1 - II(4646)		
Sample Date	9/23/2024 12:00 PM		9/23/2024 12:15 PM		9/24/2024 1:10 PM		9/24/2024 1:25 PM		
Lab ID	2061019		2061020		2061021		2061022		
Metals (Dissolved)	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**
Dissolved Aluminum			5	1	5	1	3	1	ug/L
Dissolved Barium			35.5	0.1	2130	1*	1720	1*	ug/L
Dissolved Cadmium			0.023	0.005	0.032	0.005	0.041	0.005	ug/L

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Sample Description	BH28 - I(4643)		BH28 - II(4644)		OW1 - I(4645)		OW1 - II(4646)		
Sample Date	9/23/2024 12:00 PM		9/23/2024 12:15 PM		9/24/2024 1:10 PM		9/24/2024 1:25 PM		
Lab ID	2061019		2061020		2061021		2061022		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Calcium	154000	500*	165000	500*	156000	500*	158000	500*	ug/L
Dissolved Chromium			10.1	0.1	9.5	0.1	7.6	0.1	ug/L
Dissolved Cobalt			1.8	0.1	11.7	0.1	16.6	0.1	ug/L
Dissolved Copper			2.1	0.2	2.3	0.2	2.1	0.2	ug/L
Dissolved Iron	36200	100*	1870	10	28600	100*	40600	100*	ug/L
Dissolved Lead			0.20	0.05	0.10	0.05	0.13	0.05	ug/L
Dissolved Magnesium	22800	4	14900	4	38100	4	31500	4	ug/L
Dissolved Manganese	1270	1*	305	1*	162.0	0.1	249.0	0.1	ug/L
Dissolved Nickel			14.0	0.5	11.3	0.5	10.4	0.5	ug/L
Dissolved Potassium	7560	50	20100	500*	18100	500*	19400	500*	ug/L
Dissolved Selenium			1.44	0.05	1.70	0.05	1.27	0.05	ug/L
Dissolved Silver			<0.01	0.01	0.01	0.01	0.01	0.01	ug/L
Dissolved Sodium	66100	500*	42000	500*	90500	500*	64700	500*	ug/L
Dissolved Zinc			16	1	8	1	6	1	ug/L

Sample Description	OW1 - III(4647)		OW2 - I(4648)		OW2 - II(4649)		OW3(4650)		
Sample Date	9/24/2024 1:50 PM		9/24/2024 12:00 PM		9/24/2024 12:15 PM		9/23/2024 2:45 PM		
Lab ID	2061023		2061024		2061025		2061026		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Aluminum	4	1	1	1	5	1	6	1	ug/L
Dissolved Barium	508	1*	1920	1*	1900	1*	281	1*	ug/L
Dissolved Cadmium	<0.005	0.005	0.027	0.005	0.066	0.005	0.049	0.005	ug/L
Dissolved Calcium	179000	500*	208000	500*	133000	500*	139000	500*	ug/L

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Sample Description	OW1 - III(4647)		OW2 - I(4648)		OW2 - II(4649)		OW3(4650)		
Sample Date	9/24/2024 1:50 PM		9/24/2024 12:00 PM		9/24/2024 12:15 PM		9/23/2024 2:45 PM		
Lab ID	2061023		2061024		2061025		2061026		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Chromium	7.5	0.1	13.1	0.1	10.1	0.1	7.7	0.1	ug/L
Dissolved Cobalt	1.4	0.1	2.0	0.1	14.9	0.1	1.4	0.1	ug/L
Dissolved Copper	1.8	0.2	3.8	0.2	3.0	0.2	1.5	0.2	ug/L
Dissolved Iron	10500	100*	9360	100*	50500	100*	44700	100*	ug/L
Dissolved Lead	0.08	0.05	0.07	0.05	0.15	0.05	0.33	0.05	ug/L
Dissolved Magnesium	42700	4	79900	40*	54800	40*	13900	4	ug/L
Dissolved Manganese	1300	1*	115.0	0.1	376	1*	385	1*	ug/L
Dissolved Nickel	3.6	0.5	12.4	0.5	16.3	0.5	3.9	0.5	ug/L
Dissolved Potassium	5840	50	5270	50	21100	500*	10900	50	ug/L
Dissolved Selenium	1.61	0.05	3.62	0.05	1.75	0.05	0.45	0.05	ug/L
Dissolved Silver	<0.01	0.01	<0.01	0.01	0.01	0.01	<0.01	0.01	ug/L
Dissolved Sodium	60700	500*	176000	500*	49500	500*	30000	500*	ug/L
Dissolved Zinc	7	1	8	1	6	1	6	1	ug/L

Sample Description	OW4 - I (4651)		OW4 - II (4652)		OW5 - I (4653)		OW6 - I (4654)		
Sample Date	9/23/2024 2:05 PM		9/23/2024 2:20 PM		9/23/2024 10:10 AM		9/24/2024 3:05 PM		
Lab ID	2061027		2061028		2061029		2061030		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Aluminum	3	1	19	1	2	1	7	1	ug/L
Dissolved Barium	1570	1*	33.3	0.1	1340	1*	894	1*	ug/L
Dissolved Cadmium	0.038	0.005	0.021	0.005	0.026	0.005	0.139	0.005	ug/L
Dissolved Calcium	173000	500*	109000	500*	198000	500*	154000	500*	ug/L
Dissolved Chromium	8.3	0.1	3.8	0.1	8.3	0.1	9.5	0.1	ug/L

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City of Orillia - Waste Diversion Site

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Sample Description	OW4 - I (4651)		OW4 - II (4652)		OW5 - I (4653)		OW6 - I (4654)		
Sample Date	9/23/2024 2:05 PM		9/23/2024 2:20 PM		9/23/2024 10:10 AM		9/24/2024 3:05 PM		
Lab ID	2061027		2061028		2061029		2061030		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Cobalt	1.9	0.1	0.2	0.1	6.7	0.1	13.9	0.1	ug/L
Dissolved Copper	1.1	0.2	0.8	0.2	3.2	0.2	1.3	0.2	ug/L
Dissolved Iron	26100	100*	672	10	14900	100*	49400	100*	ug/L
Dissolved Lead	0.15	0.05	0.12	0.05	0.23	0.05	0.11	0.05	ug/L
Dissolved Magnesium	22300	4	5720	4	54300	4	45700	4	ug/L
Dissolved Manganese	459	1*	289.0	0.1	866	1*	414	1*	ug/L
Dissolved Nickel	3.2	0.5	0.8	0.5	9.2	0.5	15.4	0.5	ug/L
Dissolved Potassium	3090	50	5740	50	4060	50	29200	500*	ug/L
Dissolved Selenium	0.49	0.05	<0.05	0.05	1.69	0.05	0.71	0.05	ug/L
Dissolved Silver	<0.01	0.01	<0.01	0.01	0.01	0.01	0.02	0.01	ug/L
Dissolved Sodium	25500	50	2790	50	103000	500*	21100	50	ug/L
Dissolved Zinc	8	1	5	1	9	1	5	1	ug/L

Sample Description	OW6 - II (4655)		OW7 (4656)		OW8 (4657)		OW9 - I (4658)		
Sample Date	9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 11:15 AM		9/23/2024 11:35 AM		
Lab ID	2061031		2061032		2061033		2061034		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Aluminum	12	1	3	1	<1	1	5	1	ug/L
Dissolved Barium	388	1*	266	1*	169	1*	311	1*	ug/L
Dissolved Cadmium	0.011	0.005	0.033	0.005	<0.005	0.005	0.024	0.005	ug/L
Dissolved Calcium	223000	500*	176000	500*	151000	500*	193000	500*	ug/L
Dissolved Chromium	12.5	0.1	7.7	0.1	4.8	0.1	8.0	0.1	ug/L
Dissolved Cobalt	1.4	0.1	1.0	0.1	0.7	0.1	8.1	0.1	ug/L

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Sample Description	OW6 - II (4655)		OW7 (4656)		OW8 (4657)		OW9 - I (4658)		
Sample Date	9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 11:15 AM		9/23/2024 11:35 AM		
Lab ID	2061031		2061032		2061033		2061034		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Copper	1.2	0.2	1.2	0.2	1.7	0.2	4.1	0.2	ug/L
Dissolved Iron	34400	100*	41200	100*	10700	100*	8890	100*	ug/L
Dissolved Lead	0.12	0.05	0.08	0.05	<0.05	0.05	0.15	0.05	ug/L
Dissolved Magnesium	32200	4	16700	4	8030	4	54200	4	ug/L
Dissolved Manganese	1260	1*	818	1*	527	1*	348	1*	ug/L
Dissolved Nickel	4.2	0.5	3.0	0.5	7.2	0.5	17.5	0.5	ug/L
Dissolved Potassium	21300	500*	7770	50	8510	50	26900	500*	ug/L
Dissolved Selenium	0.15	0.05	0.88	0.05	0.61	0.05	0.78	0.05	ug/L
Dissolved Silver	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	ug/L
Dissolved Sodium	20500	50	28500	500*	83800	500*	85300	500*	ug/L
Dissolved Zinc	7	1	8	1	3	1	7	1	ug/L

Sample Description	OW9 - II (4659)		Duplicate OW2 - IID (4660)		Duplicate OW504 - I (4661)		
Sample Date	9/23/2024 11:10 AM		9/24/2024 12:15 PM		9/23/2024 2:05 PM		
Lab ID	2061035		2061036		2061037		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Aluminum	3	1	4	1	3	1	ug/L
Dissolved Barium	91.1	0.1	1880	1*	1540	1*	ug/L
Dissolved Cadmium	0.118	0.005	0.058	0.005	0.031	0.005	ug/L
Dissolved Calcium	294000	500*	132000	500*	173000	500*	ug/L
Dissolved Chromium	6.5	0.1	8.5	0.1	6.8	0.1	ug/L
Dissolved Cobalt	3.7	0.1	13.2	0.1	1.9	0.1	ug/L

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Sample Description	OW9 - II (4659)		Duplicate OW2 - IID (4660)		Duplicate OW504 - I (4661)		
Sample Date	9/23/2024 11:10 AM		9/24/2024 12:15 PM		9/23/2024 2:05 PM		
Lab ID	2061035		2061036		2061037		
Metals (Dissolved)	Result	MDL	Result	MDL	Result	MDL	Units
Dissolved Copper	15.9	0.2	2.4	0.2	1.0	0.2	ug/L
Dissolved Iron	178	10	49100	100*	25600	100*	ug/L
Dissolved Lead	0.14	0.05	0.11	0.05	0.11	0.05	ug/L
Dissolved Magnesium	25800	4	57200	4	21400	4	ug/L
Dissolved Manganese	849	1*	373	1*	455	1*	ug/L
Dissolved Nickel	13.5	0.5	15.8	0.5	3.2	0.5	ug/L
Dissolved Potassium	12900	500*	20500	500*	2900	50	ug/L
Dissolved Selenium	2.02	0.05	1.95	0.05	1.07	0.05	ug/L
Dissolved Silver	0.02	0.01	0.01	0.01	<0.01	0.01	ug/L
Dissolved Sodium	172000	500*	49000	500*	25100	50	ug/L
Dissolved Zinc	10	1	6	1	8	1	ug/L

Sample Description	OW1 - I(4645)		OW1 - II(4646)		OW1 - III(4647)		OW2 - I(4648)		
Sample Date	9/24/2024 1:10 PM		9/24/2024 1:25 PM		9/24/2024 1:50 PM		9/24/2024 12:00 PM		
Lab ID	2061021		2061022		2061023		2061024		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Benzene	4.3	0.2	4.0	0.2	2.0	0.2	0.6	0.2	ug/L
Ethylbenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Toluene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
m+p-Xylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
o-Xylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Total Xylenes (Calc.)	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L

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Sample Description	OW1 - I(4645)		OW1 - II(4646)		OW1 - III(4647)		OW2 - I(4648)		
Sample Date	9/24/2024 1:10 PM		9/24/2024 1:25 PM		9/24/2024 1:50 PM		9/24/2024 12:00 PM		
Lab ID	2061021		2061022		2061023		2061024		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
1,1,1,2-Tetrachloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,1-Trichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,2,2-Tetrachloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,2-Trichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloropropene	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	ug/L
1,2,4-Trichlorobenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dibromo-3-chloropropane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
1,2-Dibromoethane	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L
1,2-Dichlorobenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dichloroethane-d4 (Surr)	110	N/A	111	N/A	106	N/A	107	N/A	% Rec
1,2-Dichloropropane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,3-Dichlorobenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,3-Dichloropropane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
1,4-Dichlorobenzene	5.5	0.5	5.8	0.5	0.8	0.5	<0.5	0.5	ug/L
1-Bromo-4-fluorobenzene (Surr.)	87	N/A	87.5	N/A	85.3	N/A	81.1	N/A	% Rec
Acetone	<30	30	<30	30	<30	30	<30	30	ug/L
Bromobenzene	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Bromochloromethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Bromodichloromethane	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L
Bromoform	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Bromomethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L

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City of Orillia - Waste Diversion Site

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Sample Description	OW1 - I(4645)		OW1 - II(4646)		OW1 - III(4647)		OW2 - I(4648)		
Sample Date	9/24/2024 1:10 PM		9/24/2024 1:25 PM		9/24/2024 1:50 PM		9/24/2024 12:00 PM		
Lab ID	2061021		2061022		2061023		2061024		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Carbon tetrachloride	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L
Chlorobenzene	9.7	0.5	9.4	0.5	2.8	0.5	<0.5	0.5	ug/L
Chloroethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Chloroform	<1	1	<1	1	<1	1	<1	1	ug/L
Chloromethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
cis - + trans-1,3-Dichloropropene (Calc.)	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
cis-1,2-Dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
cis-1,3-Dichloropropene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Dibromochloromethane	<2	2	<2	2	<2	2	<2	2	ug/L
Dibromomethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Dichlorodifluoromethane	<2	2	<2	2	<2	2	<2	2	ug/L
Dichloromethane	<5	5	<5	5	<5	5	<5	5	ug/L
Hexachlorobutadiene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Methyl ethyl ketone	<20	20	<20	20	<20	20	<20	20	ug/L
Methyl isobutyl ketone (MIBK)	<20	20	<20	20	<20	20	<20	20	ug/L
Methyl tert-butyl ether (MTBE)	<2	2	<2	2	<2	2	<2	2	ug/L
n-Hexane	<5	5	<5	5	<5	5	<5	5	ug/L
Styrene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Tetrachloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Toluene-d8 (Surr.)	107	N/A	107	N/A	107	N/A	106	N/A	% Rec
Trans-1,2-dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Trans-1,3-dichloropropene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Trichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L

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Sample Description	OW1 - I(4645)		OW1 - II(4646)		OW1 - III(4647)		OW2 - I(4648)		
Sample Date	9/24/2024 1:10 PM		9/24/2024 1:25 PM		9/24/2024 1:50 PM		9/24/2024 12:00 PM		
Lab ID	2061021		2061022		2061023		2061024		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Trichlorofluoromethane	<5	5	<5	5	<5	5	<5	5	ug/L
Vinyl chloride	1.5	0.1	1.1	0.1	<0.1	0.1	1.8	0.1	ug/L

Sample Description	OW2 - II(4649)		OW3(4650)		OW4 - I (4651)		OW4 - II (4652)		
Sample Date	9/24/2024 12:15 PM		9/23/2024 2:45 PM		9/23/2024 2:05 PM		9/23/2024 2:20 PM		
Lab ID	2061025		2061026		2061027		2061028		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Benzene	1.3	0.2	0.3	0.2	<0.2	0.2	<0.2	0.2	ug/L
Ethylbenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Toluene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
m+p-Xylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
o-Xylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Total Xylenes (Calc.)	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,1,2-Tetrachloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,1-Trichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,2,2-Tetrachloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,2-Trichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloropropene	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	ug/L
1,2,4-Trichlorobenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dibromo-3-chloropropane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
1,2-Dibromoethane	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L

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Sample Description	OW2 - II(4649)		OW3(4650)		OW4 - I (4651)		OW4 - II (4652)		
Sample Date	9/24/2024 12:15 PM		9/23/2024 2:45 PM		9/23/2024 2:05 PM		9/23/2024 2:20 PM		
Lab ID	2061025		2061026		2061027		2061028		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
1,2-Dichlorobenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dichloroethane-d4 (Surr)	105	N/A	105	N/A	105	N/A	105	N/A	% Rec
1,2-Dichloropropane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,3-Dichlorobenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,3-Dichloropropane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
1,4-Dichlorobenzene	1.1	0.5	0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1-Bromo-4-fluorobenzene (Surr.)	87.8	N/A	89.3	N/A	81.8	N/A	83.2	N/A	% Rec
Acetone	<30	30	53	30	<30	30	<30	30	ug/L
Bromobenzene	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Bromochloromethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Bromodichloromethane	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L
Bromoform	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Bromomethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Carbon tetrachloride	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L
Chlorobenzene	1.7	0.5	1.1	0.5	<0.5	0.5	<0.5	0.5	ug/L
Chloroethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Chloroform	<1	1	<1	1	<1	1	<1	1	ug/L
Chloromethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
cis - + trans-1,3-Dichloropropene (Calc.)	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
cis-1,2-Dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
cis-1,3-Dichloropropene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Dibromochloromethane	<2	2	<2	2	<2	2	<2	2	ug/L

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	OW2 - II(4649)		OW3(4650)		OW4 - I (4651)		OW4 - II (4652)		
Sample Date	9/24/2024 12:15 PM		9/23/2024 2:45 PM		9/23/2024 2:05 PM		9/23/2024 2:20 PM		
Lab ID	2061025		2061026		2061027		2061028		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Dibromomethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Dichlorodifluoromethane	<2	2	<2	2	<2	2	<2	2	ug/L
Dichloromethane	<5	5	<5	5	<5	5	<5	5	ug/L
Hexachlorobutadiene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Methyl ethyl ketone	<20	20	<20	20	<20	20	<20	20	ug/L
Methyl isobutyl ketone (MIBK)	<20	20	<20	20	<20	20	<20	20	ug/L
Methyl tert-butyl ether (MTBE)	<2	2	<2	2	<2	2	<2	2	ug/L
n-Hexane	<5	5	<5	5	<5	5	<5	5	ug/L
Styrene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Tetrachloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Toluene-d8 (Surr.)	105	N/A	106	N/A	106	N/A	104	N/A	% Rec
Trans-1,2-dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Trans-1,3-dichloropropene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Trichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Trichlorofluoromethane	<5	5	<5	5	<5	5	<5	5	ug/L
Vinyl chloride	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	ug/L

Sample Description	OW6 - I (4654)		OW6 - II (4655)		OW7 (4656)		Duplicate OW2 - IID (4660)		
Sample Date	9/24/2024 3:05 PM		9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 12:15 PM		
Lab ID	2061030		2061031		2061032		2061036		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Benzene	2.0	0.2	1.1	0.2	0.8	0.2	1.2	0.2	ug/L
Ethylbenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	OW6 - I (4654)		OW6 - II (4655)		OW7 (4656)		Duplicate OW2 - IID (4660)		
Sample Date	9/24/2024 3:05 PM		9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 12:15 PM		
Lab ID	2061030		2061031		2061032		2061036		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Toluene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
m+p-Xylene	54.5	0.5	1600	5	4.6	0.5	<0.5	0.5	ug/L
o-Xylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Total Xylenes (Calc.)	54.5	0.5	2180.0	0.5	4.6	0.5	<0.5	0.5	ug/L
1,1,1,2-Tetrachloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,1-Trichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,2,2-Tetrachloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1,2-Trichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,1-Dichloropropene	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	ug/L
1,2,4-Trichlorobenzene	0.7	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dibromo-3-chloropropane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
1,2-Dibromoethane	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L
1,2-Dichlorobenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dichloroethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,2-Dichloroethane-d4 (Surr)	106	N/A	104	N/A	107	N/A	102	N/A	% Rec
1,2-Dichloropropane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,3-Dichlorobenzene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
1,3-Dichloropropane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
1,4-Dichlorobenzene	3.6	0.5	0.9	0.5	0.6	0.5	0.7	0.5	ug/L
1-Bromo-4-fluorobenzene (Surr.)	95.2	N/A	114	N/A	84.7	N/A	90.2	N/A	% Rec
Acetone	<30	30	<30	30	<30	30	<30	30	ug/L

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	OW6 - I (4654)		OW6 - II (4655)		OW7 (4656)		Duplicate OW2 - IID (4660)		
Sample Date	9/24/2024 3:05 PM		9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 12:15 PM		
Lab ID	2061030		2061031		2061032		2061036		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Bromobenzene	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Bromochloromethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Bromodichloromethane	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L
Bromoform	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Bromomethane	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Carbon tetrachloride	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	ug/L
Chlorobenzene	21.2	0.5	7.8	0.5	3.1	0.5	2.0	0.5	ug/L
Chloroethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Chloroform	<1	1	<1	1	<1	1	<1	1	ug/L
Chloromethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
cis - + trans-1,3-Dichloropropene (Calc.)	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
cis-1,2-Dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
cis-1,3-Dichloropropene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Dibromochloromethane	<2	2	<2	2	<2	2	<2	2	ug/L
Dibromomethane	<0.3	0.3	<0.3	0.3	<0.3	0.3	<0.3	0.3	ug/L
Dichlorodifluoromethane	<2	2	<2	2	<2	2	<2	2	ug/L
Dichloromethane	<5	5	<5	5	<5	5	<5	5	ug/L
Hexachlorobutadiene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Methyl ethyl ketone	<20	20	<20	20	<20	20	<20	20	ug/L
Methyl isobutyl ketone (MIBK)	<20	20	<20	20	<20	20	<20	20	ug/L
Methyl tert-butyl ether (MTBE)	<2	2	<2	2	<2	2	<2	2	ug/L
n-Hexane	<5	5	<5	5	<5	5	<5	5	ug/L
Styrene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	OW6 - I (4654)		OW6 - II (4655)		OW7 (4656)		Duplicate OW2 - IID (4660)		
Sample Date	9/24/2024 3:05 PM		9/24/2024 3:20 PM		9/23/2024 9:00 AM		9/24/2024 12:15 PM		
Lab ID	2061030		2061031		2061032		2061036		
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units
Tetrachloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Toluene-d8 (Surr.)	105	N/A	94.1	N/A	105	N/A	104	N/A	% Rec
Trans-1,2-dichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Trans-1,3-dichloropropene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Trichloroethylene	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	ug/L
Trichlorofluoromethane	<5	5	<5	5	<5	5	<5	5	ug/L
Vinyl chloride	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	ug/L

Sample Description	Duplicate OW504 - I (4661)		
Sample Date	9/23/2024 2:05 PM		
Lab ID	2061037		
Volatile Organic Compounds	Result	MDL	Units
Benzene	0.3	0.2	ug/L
Ethylbenzene	<0.5	0.5	ug/L
Toluene	<0.5	0.5	ug/L
m+p-Xylene	<0.5	0.5	ug/L
o-Xylene	<0.5	0.5	ug/L
Total Xylenes (Calc.)	<0.5	0.5	ug/L
1,1,1,2-Tetrachloroethane	<0.5	0.5	ug/L
1,1,1-Trichloroethane	<0.5	0.5	ug/L
1,1,2,2-Tetrachloroethane	<0.5	0.5	ug/L
1,1,2-Trichloroethane	<0.5	0.5	ug/L

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City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	Duplicate OW504 - I (4661)
Sample Date	9/23/2024 2:05 PM
Lab ID	2061037

Volatile Organic Compounds	Result	MDL	Units
1,1-Dichloroethane	<0.5	0.5	ug/L
1,1-Dichloroethylene	<0.5	0.5	ug/L
1,1-Dichloropropene	<0.1	0.1	ug/L
1,2,4-Trichlorobenzene	<0.5	0.5	ug/L
1,2-Dibromo-3-chloropropane	<0.3	0.3	ug/L
1,2-Dibromoethane	<0.2	0.2	ug/L
1,2-Dichlorobenzene	<0.5	0.5	ug/L
1,2-Dichloroethane	<0.5	0.5	ug/L
1,2-Dichloroethane-d4 (Surr)	106	N/A	% Rec
1,2-Dichloropropane	<0.5	0.5	ug/L
1,3-Dichlorobenzene	<0.5	0.5	ug/L
1,3-Dichloropropane	<0.3	0.3	ug/L
1,4-Dichlorobenzene	<0.5	0.5	ug/L
1-Bromo-4-fluorobenzene (Surr.)	81.1	N/A	% Rec
Acetone	<30	30	ug/L
Bromobenzene	<0.3	0.3	ug/L
Bromochloromethane	<0.3	0.3	ug/L
Bromodichloromethane	<0.2	0.2	ug/L
Bromoform	<0.5	0.5	ug/L
Bromomethane	<0.5	0.5	ug/L
Carbon tetrachloride	<0.2	0.2	ug/L
Chlorobenzene	<0.5	0.5	ug/L
Chloroethane	<0.3	0.3	ug/L

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City of Orillia - Waste Diversion Site

Work Order Number: 551638

Sample Description	Duplicate OW504 - I (4661)
Sample Date	9/23/2024 2:05 PM
Lab ID	2061037

Volatile Organic Compounds	Result	MDL	Units
Chloroform	<1	1	ug/L
Chloromethane	<0.3	0.3	ug/L
cis - + trans-1,3-Dichloropropene (Calc.)	<0.5	0.5	ug/L
cis-1,2-Dichloroethylene	<0.5	0.5	ug/L
cis-1,3-Dichloropropene	<0.5	0.5	ug/L
Dibromochloromethane	<2	2	ug/L
Dibromomethane	<0.3	0.3	ug/L
Dichlorodifluoromethane	<2	2	ug/L
Dichloromethane	<5	5	ug/L
Hexachlorobutadiene	<0.5	0.5	ug/L
Methyl ethyl ketone	<20	20	ug/L
Methyl isobutyl ketone (MIBK)	<20	20	ug/L
Methyl tert-butyl ether (MTBE)	<2	2	ug/L
n-Hexane	<5	5	ug/L
Styrene	<0.5	0.5	ug/L
Tetrachloroethylene	<0.5	0.5	ug/L
Toluene-d8 (Surr.)	102	N/A	% Rec
Trans-1,2-dichloroethylene	<0.5	0.5	ug/L
Trans-1,3-dichloropropene	<0.5	0.5	ug/L
Trichloroethylene	<0.5	0.5	ug/L
Trichlorofluoromethane	<5	5	ug/L
Vinyl chloride	<0.1	0.1	ug/L

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CERTIFICATE OF ANALYSIS

City of Orillia - Waste Diversion Site

Work Order Number: 551638

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

MDL: Method detection limit or minimum reporting limit.

[ ]: Results for laboratory replicates are shown in square brackets immediately below the associated sample result for ease of comparison.

% Rec: Surrogate compounds are added to the sample in some cases and the recovery is reported as a % recovered.

Organic Soil Analysis: Data reported for organic analysis in soils samples are corrected for moisture content.

Quality Control: All associated Quality Control data is available on request.

Field Data: Reports containing Field Parameters represent data that has been collected and provided by the client. Testmark is not responsible for the validity of this data which may be used in subsequent calculations.

Sample Condition Deviations: A noted sample condition deviation may affect the validity of the result. Results apply to the sample(s) as received.

ICPMS Dustfall Insoluble: The ICPMS Dustfall Insoluble Portion method analyzes only the particulate matter from the Dustfall Sampler which is retained on the analysis filter during the Dustfall method.

Regulation Comparisons: Disclaimer: Please note that regulation criteria are provided for comparative purposes, however the onus on ensuring the validity of this comparison rests with the client.

*Dilution: In the MDL column an asterisk (*) indicates a sample dilution was performed.

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GENERAL CHAIN OF CUSTODY FORM

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REPORT TO:
Client: City of Orillia - Waste Diversion Site
Address: 40 Kitchener St.
Orillia, ON L3V 6Z9
Contact: Hannah Curry
Email: Use Distribution List
Phone: 705-325-2436 Fax:

INVOICE TO: (if different from Report)
Client:
Address:
Contact:
Email:
Phone: Fax:

PROJECT INFORMATION:
TM Quote #:
Client P.O. #: 84138
Client Project #: Fall WDS Sampling
KP

REPORTING/INVOICING FORMAT
☐ Fax ☑ Email ☐ Mail

QC DATA REPORTED
☐ Yes ☑ No

SAMPLE DISPOSAL
☐ Hold ☑ Dispose ☐ Return

TURN AROUND TIME (TAT)*
☐ Micro Only Rush ☐ ASAP
☐ 1 Business Day ☐ 2 Business Days
☐ 3 Business Days ☑ Standard
DUE DATE: Fri 04
* Prior arrangements must be made for rush/weekend/holiday work

LABORATORY USE ONLY
WORK ORDER NUMBER: 551638

SAMPLING DATE (mm-dd-yy)	TIME	MATRIX **	SAMPLE DESCRIPTION (This Will Appear On The Report)	NUMBER OF CONTAINERS	ICPMSD - LL (Trace Metals)*	OP	TP	Ammonium	Ion Balance	VOC	GW Major Ions	CONFIRMATION REPORT SENT	FIELD pH (if applicable)	FIELD TEMP (if applicable)	METALS FIELD FILTERED (Y/N) ?	CONTAINERS RECEIVED	TEMP	Btl. Type	Lab-ID
09/23/24	12:00	GW	BH28-I (4643)	7		x	x	x	x		x		6.70	10.7	Y	7	13.1	3H, 2RL, 1HL, 1N	2061019
09/23/24	12:15	GW	BH28-II (4644)	7	x	x	x	x	x		x		6.82	15.1	Y	↓		↓	2061020
09/24/24	13:10	GW	OW1-I(4645)	9	x	x	x	x	x	x	x		6.58	8.9	Y	9		3H, 2RL, 1HL, 1N, 2V	2061021
09/24/24	13:25	GW	OW1-II(4646)	9	x	x	x	x	x	x	x		6.55	8.9	Y				2061022
09/24/24	13:50	GW	OW1-III(4647)	9	x	x	x	x	x	x	x		6.59	11.5	Y				2061023
09/24/24	12:00	GW	OW2-I(4648)	9	x	x	x	x	x	x	x		6.57	9.3	Y				2061024
09/24/24	12:15	GW	OW2-II(4649)	9	x	x	x	x	x	x	x		6.59	9.4	Y				2061025
09/23/24	14:45	GW	OW3(4650)	9	x	x	x	x	x	x	x		6.55	11.9	Y				2061026
09/23/24	14:05	GW	OW4-I (4651)	9	x	x	x	x	x	x	x		6.52	9.9	Y				2061027
09/23/24	14:20	GW	OW4-II (4652)	9	x	x	x	x	x	x	x		6.72	13.9	Y	↓			2061028
09/23/24	10:10	GW	OW5-I (4653)	7	x	x	x	x	x		x		6.46	10.3	Y	7	↓	(3H, 2RL, 1HL, 1N)	2061029

**Matrix: B=Biota, GW=Groundwater, O=Oil, P=Paint, S=Soil, SL=Sludge, SW=Surface Water, W=Water, WW=Wastewater, SD=Sediment

☐ High Concentrations Expected

COMMENTS/FIELD NOTES: Samples to be field filtered using a 0.45µm filter for dissolved metals only.

*Trace Metals (ICPMS Dissolved - Low-Level): Aluminum, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Zinc

REGULATION
☐ O.Reg. 153 ☐ O.Reg. 406 Bulk ☐ O.Reg. 406 SPLP Leachate
Table ☐ 1 ☐ 2/2.1 ☐ 3/3.1 ☐ 4/4.1 ☐ 5/5.1 ☐ 6/6.1 ☐ 7/7.1 ☐ 8/8.1 ☐ 9/9.1
☐ Industrial / Commercial ☐ Residential / Parkland / Institutional ☐ Agricultural
☐ Groundwater ☐ Coarse Soil ☐ Fine Soil ☐ Surface ☐ Subsurface
☐ O.Reg. 558 ☐ PWQO ☐ MISA ☐ CofA ☐ MDMER ☐ ODWS ☐ None
Sewer Use: ☐ Sanitary ☐ Storm Municipality:
☐ Other:

Relinquished to Testmark By (Signature)		Date 09/26/24	Time 15:00
Sampled By H.curry	Date 09/23/2024	Time 09:00	
Shipped By Purolator		Shipping Reference 334914797884/334915 12648 72	
Received By curry	Date 09/24/2024	Time 09:00	
Received at Testmark By JP		Date 09/27/24	Time 11:45

551638 M

7 Margaret Street, Garson, ON, P3L 1E1 • 705-693-1121 (P) • 705-693-1124 (F) • customer.service@testmark.ca
1335 Riverside Drive, Timmins, ON, P4R 1A6 • 705-531-1121 (P) • 705-531-1125 (F) • timmins@testmark.ca
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1470 Government Road, Kirkland Lake, ON P2N 3J1 • 705-642-3361 (P) • 705-642-3222 (F) • kirkland.lake@testmark.ca
1131 Central Ave., Unit 2 Thunder Bay, ON P7B 7C9 • 807-333-0921 (P) • 807-333-0924 (F) • thunder.bay@testmark.ca

TESTMARK Laboratories
Committed to Quality and Service

GENERAL CHAIN OF CUSTODY FORM

Please use our Drinking Water Chain of Custody Form for regulated drinking water samples

REPORT TO:		**INVOICE TO: (if different from Report)**		**PROJECT INFORMATION:**	
Client:	City of Orillia - Waste Diversion Site	Client:		TM Quote #:	
Address:	40 Kitchener St.	Address:		Client P.O. #:	84138
	Orillia, ON L3V 6Z9			Client Project #:	
Contact:	Hannah Curry	Contact:			Fall WDS Sampling
Email:	Use Distribution List	Email:			KP
Phone:	705-325-2436 Fax:	Phone:	Fax:		

REPORTING/INVOICING FORMAT
☐ Fax ☑ Email ☐ Mail

QC DATA REPORTED
☐ Yes ☑ No

SAMPLE DISPOSAL
☐ Hold ☑ Dispose ☐ Return

TURN AROUND TIME (TAT)*
☐ Micro Only Rush ☐ ASAP
☐ 1 Business Day ☐ 2 Business Days
☐ 3 Business Days ☑ Standard
DUE DATE: Fri 04
* Prior arrangements must be made for rush/weekend/holiday work

LABORATORY USE ONLY
WORK ORDER NUMBER: 551638

SAMPLING DATE (mm-dd-yy)	TIME	MATRIX **	SAMPLE DESCRIPTION (This Will Appear On The Report)	NUMBER OF CONTAINERS	ICPMSD - LL (Trace Metals)*	OP	TP	Ammonium	Ion Balance	VOC	GW Major Ions								FIELD pH (if applicable)	FIELD TEMP (if applicable)	METALS FIELD FILTERED (Y/N) ?	CONTAINERS RECEIVED	TEMP	Btl. Type	Lab ID
				ANALYSIS REQUESTED																					
09/24/24	15:05	GW	OW6-I (4654)	9	x	x	x	x	x	x	x								6.50	9.4	Y	9	13.1	3H, 2RL, 1HL, 1N, 2V	2061030
09/24/24	15:20	GW	OW6-II (4655)	9	x	x	x	x	x	x	x								6.42	12.8	Y	↓		↓	2061031
09/23/24	9:00	GW	OW7 (4656)	9	x	x	x	x	x	x	x								6.48	9.9	Y	↓		↓	2061032
09/24/24	11:15	GW	OW8 (4657)	7	x	x	x	x	x		x								6.73	13.2	Y	7		(3H, 2RL, 1HL, 1N)	2061033
09/23/24	11:35	GW	OW9-I (4658)	7	x	x	x	x	x		x								6.73	9.4	Y	↓		↓	2061034
09/23/24	11:10	GW	OW9-II (4659)	7	x	x	x	x	x		x								6.65	13.5	Y	↓		↓	2061035
09/24/24	12:15	GW	Duplicate OW2-IID (4660)	9	x	x	x	x	x	x	x								6.57	9.4	Y	9		(3H, 2RL, 1HL, 1N, 2V)	2061036
09/23/24	14:05	GW	Duplicate OW504-I (4661)	9	x	x	x	x	x	x	x								6.52	9.9	Y	↓		↓	2061037

**Matrix: B=Biota, GW=Groundwater, O=Oil, P=Paint, S=Soil, SL=Sludge, SW=Surface Water, W=Water, WW=Wastewater, SD=Sediment

☐ High Concentrations Expected

COMMENTS/FIELD NOTES: Samples to be field filtered using a 0.45µm filter for dissolved metals only.

*Trace Metals (ICPMS Dissolved - Low-Level): Aluminum, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Zinc

REGULATION

☐ O.Reg. 153 ☐ O.Reg. 406 Bulk ☐ O.Reg. 406 SPLP Leachate
Table ☐ 1 ☐ 2/2.1 ☐ 3/3.1 ☐ 4/4.1 ☐ 5/5.1 ☐ 6/6.1 ☐ 7/7.1 ☐ 8/8.1 ☐ 9/9.1
☐ Industrial / Commercial ☐ Residential / Parkland / Institutional ☐ Agricultural
☐ Groundwater ☐ Coarse Soil ☐ Fine Soil ☐ Surface ☐ Subsurface
☐ O.Reg. 558 ☐ PWQO ☐ MISA ☐ CofA ☐ MDMER ☐ ODWS ☐ None
Sewer Use: ☐ Sanitary ☐ Storm Municipality:
☐ Other:

Sampled By	Date	Time
H.Curry	09/23/2024	09:00

Received By	Date	Time
H.Curry	09/23/2024	09:00

Relinquished to Testmark By (Signature)	Date	Time
	09/26/24	15:00

Shipped By	Shipping Reference

Received at Testmark By	Date	Time

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APPENDIX D

2024 Field Notes and Monitoring Procedures

Solid Waste Management Operations Manual - Part F
Water Monitoring Protocols

Table 1: Calibration Log For Hach Pocket Pro Multi 2 Tester

Date m/d/y	Time	pH			Conductivity *µs/cm*	Initials/Comments
		Buffer 4	***Buffer 7***	***Buffer 10***		
09/23/24	8:00	3.93	7.17	9.90	1405	HC
09/24/24	8:00	3.78	7.03	9.85	1305	HC
09/25/24	8:00	4.04	7.06	9.95	1410	HC
09/26/24	8:10	4.04	7.06	10.04	1348	HC
010/01/24	9:00	4.06	7.12	10.18	1310	HC
010/02/24	8:30	4.11	7.16	10.21	1407	HC
010/03/24	9:00	3.96	7.02	9.81	1180	HC
010/07/24	8:30	3.93	7.00	9.79	1218	HC
010/08/24	9:00	4.14	6.87	10.19	1243	ZG
010/09/24	9:00	4.08	7.02	9.89	1258	ZG
010/10/24	8:30	4.07	7.13	9.9	1292	ZG

Date m/d/y	Time	pH			Conductivity *µs/cm*	D.O. *% Sat.*	Initials/Comments
		Buffer 4	***Buffer 7***	***Slope***			
09/25/24	8:10	4.01	7.00	98%	1413	102.3	HC

CITY OF ORILLIA
Kitchener Park - OBSERVATION WELL DATA
Spring 2024

BH	LAB NO.	SWL	TOTAL DEPTH				PURGING					SAMPLING					LAB	GENERAL COMMENTS
				Calculated		Actual	DATE	TIME	pH	COND	TEMP	DATE	TIME	pH	COND	TEMP	COD	
		m	m	1 Well	(3x)		d/m/y			µS	°C	d/m/y			µS	°C	mg/l	(smell, colour, etc.)
OW1-IR	4645	1.15	12.38	22.797	68.391	68L	24/09/2024	12:50	6.54	1942	9.6	24/09/2024	13:10	6.58	1938	8.9	68.3	
							24/09/2024	13:00	6.56	1938	8.9							
OW1-II	4646	1.34	7.07	11.63	34.90	35L	24/09/2024	13:15	6.52	1886	9.1	24/09/2024	13:25	6.50	1849	8.9	70.1	
							24/09/2024	13:20	6.56	1878	9.4							
OW1-III	4647	1.41	3.20	3.63	10.90	11L	24/09/2024	13:36	6.58	1772	11.7	24/09/2024	13:50	6.59	1759	11.5	70.1	
							24/09/2024	13:45	6.59	1750	11.7							
OW2-I	4648	2.26	10.32	16.36	49.09	49L	24/09/2024	11:45	6.54	2060	9.9	24/09/2024	12:00	6.57	2056	9.3	78	TCE in Well - Foamy water
							24/09/2024	11:52	6.52	2057	8.7							
OW2-II	4649	1.94	7.69	11.67	35.02	35L	24/09/2024	12:05	6.58	1938	9.0	24/09/2024	12:15	6.57	1936	9.4	72.4	Sudsy Sweet Smell - TCE
							24/09/2024	12:10	6.59	1896	9.3							
OW3	4650	4.22	5.47	2.54	7.61	8L	23/09/2024	14:30	6.59	1317	12.5	23/09/2024	14:45	6.55	1371	11.9	72.2	
							23/09/2024	14:38	6.56	1356	11.9							
OW4-I	4651	1.65	7.47	11.81	35.44	35L	23/09/2024	13:45	6.42	1236	10.9	23/09/2024	14:05	6.52	1353	9.9	74.3	
							23/09/2024	13:55	6.50	1269	9.4							
OW4-II	4652	1.64	2.82	2.40	7.19	7L	23/09/2024	14:10	6.70	682	13.9	23/09/2024	14:20	6.72	687	13.9	39.7	
							23/09/2024	14:15	6.69	688	13.7							
OW5-I	4653	2.59	7.81	10.60	31.79	32L	23/09/2024	9:58	6.37	2004	10.4	23/09/2024	10:05	6.36	2006	10.2	69.6	
												23/09/2024	10:10	6.46	2006	10.3		
OW5-II		2.7	6.31				23/09/2024	9:45										
OW6-I	4654	3.24	7.93	9.52	28.56	29L	24/09/2024	14:50	6.46	1717	9.9	24/09/2024	15:05	6.55	1781	9.4	55.7	Very Silty
							24/09/2024	14:56	6.50	1777	10.1							
OW6-II	4655	2.28	4.94	5.40	16.20	16L	24/09/2024	15:10	6.44	1878	12.7	24/09/2024	15:20	6.42	1907	12.8	72.5	Garbage Odour
							24/09/2024	15:12	6.42	1899	12.7							
OW7	4656	4.97	10.93	12.10	36.30	36L	23/09/2024	8:38	6.44	1492	11.0	23/09/2024	9:00	6.48	1534	9.9	48.9	Garbage Odour
							23/09/2024	8:46	6.45	1537	9.7							
OW8	4657	3.99	4.08	0.18	0.55	555ml	24/24/2024	10:55	6.47	1549	4.2	24/24/2024	11:15	6.73	1613	13.2	70.4	Well very dry not much water
							24/24/2024	11:08	6.69	1606	13.2							
OW9-I	4658	4.85	9.46	9.36	28.075	28L	23/09/2024	11:20	6.73	2082	9.6	23/09/2024	11:35	6.73	2071	9.4	65.1	
							23/09/2024	11:28	6.71	2079	9.5							
OW9-II	4659	4.61	6.43	3.69	11.08	11L	23/09/2024	10:50	6.56	2076	14.4	23/09/2024	11:10	6.65	2087	13.5	49.8	
							23/09/2024	11:05	6.61	2077	13.9							
GP-KP2		4.26	6.41				23/09/2024	9:14										
GP-KP3		4.40	5.44				23/09/2024	9:30										
GP-KP4		2.24	3.68				24/09/2024	10:08										
GP-KP7		4.54	4.55				23/09/2024	9:05										
GP-KP8		3.62	5.64				23/09/2024	9:08										
GP-KP12		3.78	3.79				23/09/2024	9:19										
GP-KP13		2.92	3.69				23/09/2024	9:35										
GP-KP14		2.40	3.19				23/09/2024	9:40										
GP-KP15		1.86	2.72				24/09/2024	10:15										
BH28-I		3.17	6.14	6.03	18.09	18L	23/09/2024	11:48	6.64	1621	11.8	23/09/2024	12:00	6.70	1628	10.7	54.2	Strong Leachate odour
							23/09/2024	11:55	6.65	1625	11.7							
BH28-II		2.57	3.02	0.91	2.74	3L	24/09/2024	12:02	6.60	1498	14.3	24/09/2024	12:15	6.82	1625	15.1	249	
							24/09/2024	12:10	6.57	1495	14.2							

DUPLICATES

BH	LAB NO.	SWL	TOTAL DEPTH	VOLUME (litres)			PURGING					SAMPLING					LAB	
				Calculated		Actual	DATE	TIME	pH	COND	TEMP	DATE	TIME	pH	COND	TEMP	COD	
OW2-IID	4660	1.94	7.69	11.67	35.02	35L	24/09/2024	0.5034722	6.58	1938	9.0	24/09/2024	0.51	6.57	1936	9.4		
							24/09/2024	0.5069444	6.59	1896	9.3							
OW504-I	4661	1.65	7.47	11.81	35.44	35L	23/09/2024	13:45	6.42	1236	10.9	23/09/2024	14:05	6.52	1353	9.9		
							23/09/2024	13:55	6.50	1269	9.4							

CITY OF ORILLIA WASTE DIVERSION SITE WATER QUALITY MONITORING PROGRAM
COD RESULTS FOR GROUNDWATER AND SURFACE SAMPLES
GROUNDWATER IDENTIFIED AS (BH) SURFACE WATER IDENTIFIED AS (S)

SAMPLE DESCRIPTION	**OW1-I**	**OW1-II**	**OW1-III**	**OW2-I**	**OW2-II**	**OW3**	**OW4-I**	**OW4-II**	**OW5-I**
COD mg/l	68.3	70.1	70.1	78	72.4	72.2	74.3	39.7	69.6
CITY OF ORILLIA									
SAMPLE DESCRIPTION	**OW8**	**OW9-I**	**OW9-II**	**BH28-I**	**BH28-II**				
COD mg/l	70.4	65.1	49.8	54.2	249				
CITY OF ORILLIA									
	Duplicates								
SAMPLE DESCRIPTION	**OW2-IID**	**OW504-I**							
COD mg/l	56.9	69.9							
CITY OF ORILLIA									
SAMPLE DESCRIPTION									
SAMPLE DATE (M,D,Y)									
COD mg/l									
CITY OF ORILLIA									

Analysis performed by Jacob Hood, Environmental Officer, City of Orillia

Verified by Greg Preston, Director of Waste Management and Environmental Compliance

N/S means no sample taken

All values mg/L

OW6-I	OW6-II	OW7
55.7	72.5	48.9

APPENDIX E

Documentation

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 5412-BE7KES
Issue Date: July 18, 2019

The Corporation of the City of Orillia
50 Andrew St S, No. 300
Orillia, Ontario
L3V 7T5

Site Location: 25 Kitchener Street
Orillia City, County of Simcoe
L3V 6Z9

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

- one (1) passive landfill gas venting system, consisting of an underground perforated header pipe discharging to the air through three (3) passive vents equipped with wind turbine ventilators, identified as Sources STCK1-STCK3, each having an exit diameter of 0.1 metre and each extending approximately 6.0 metres above grade;

- fugitive emissions associated with the landfill mound;

all in accordance with the Application for Approval (Air & Noise) submitted by The Corporation of the City of Orillia, dated March 29, 2019, and signed by Andrew Schell, Director of Environmental Services and Operations; and the supporting information, including the Emission Summary and Dispersion Modelling Report, submitted by Golder Associates Ltd., dated April 2, 2019, and signed by Katherine Armstrong, and the additional information submitted by Golder Associates Ltd., dated June 19, 2019 and sent via e-mail by Katherine Armstrong.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "*Approval*" means this Environmental Compliance Approval, including the application and supporting documentation listed above;

2. "*Company*" means The Corporation of the City of Orillia, that is responsible for the construction or

operation of the *Facility* and includes any successors and assigns;

3. "*District Manager*" means the District Manager of the appropriate local district office of the *Ministry,* where the *Facility* is geographically located;

4. "*EPA*" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;

5. "*Equipment*" means the equipment and processes described in the *Company* 's application, this *Approval* and in the supporting documentation submitted with the application, to the extent approved by this *Approval;*

6. "*Facility*" means the entire operation located on the property where the *Equipment* is located;

7. "*Manual*" means a document or a set of documents that provide written instructions to staff of the *Company;*

8. "*Ministry*" means the ministry of the government of Ontario responsible for the *EPA* and includes all officials, employees or other persons acting on its behalf;

9. "*Publication NPC-300*" means the *Ministry* Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August 2013, as amended.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. MONITORING AND REPORTING

1. The *Company* shall submit, before commencement of operation of the *Equipment,* to the *District Manager* a draft monitoring plan for the gas collected and discharged from the *Equipment.* The *Company* shall finalize the monitoring plan in consultation with the *District Manager.* The monitoring plan shall include, as a minimum, the following:

    a. The frequency of monitoring, either at least quarterly initially or at a frequency agreed by the *District Manager;*

    b. methodology to measure the volumetric flow rate of landfill gas discharging up the vertical riser pipes and the concentrations of contaminants in the gas discharging to the air;

c. procedures to measure and record the wind speed and wind direction at the location where the *Equipment* is installed, at times of monitoring;

d. The *Company* shall implement the finalized monitoring plan upon acceptance from the *District Manager.*

2. The *Company* shall submit, not later than **April 30, 2021** and each subsequent year thereafter, to the *District Manager* annual reports on the results of the monitoring plan implementation for the preceding year. Each annual report shall include, as a minimum, the following:

a. the frequency of monitoring adopted;

b. the measured volumetric flow rates of landfill gas discharging up the vertical riser pipes and the concentrations of contaminants in the gas discharging to the air;

c. the wind speeds and wind directions recorded at the times of monitoring; and,

d. the results of dispersion calculations, using one of the approved dispersion models listed in section 6 of O. Reg. 419/05 applicable to the *Facility,* indicating the maximum point of impingement concentrations of contaminants in the gas discharging to the air using the results of monitoring.

2. OPERATION AND MAINTENANCE

1. The *Company* shall ensure that the *Equipment* is properly operated and maintained at all times. The *Company* shall:

a. prepare, before commencement of operation of the *Equipment,* and update, as necessary, a *Manual* outlining the operating procedures and a maintenance program for the *Equipment,* including:

i. routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the *Equipment* suppliers;

ii. emergency procedures;

iii. procedures for any record keeping activities relating to operation and maintenance of the *Equipment;* and,

iv. all appropriate measures to minimize noise and odorous emissions from all potential sources;

b. implement the recommendations of the *Manual.*

3. RECORD RETENTION

1. The *Company* shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by this *Approval,* and make these records available for review by staff of the *Ministry* upon request. The *Company* shall retain:

    a. all records on the maintenance, repair and inspection of the *Equipment;* and

    b. all records of any environmental complaints, including:

        i. a description, time and date of each incident to which the complaint relates;

        ii. wind direction at the time of the incident to which the complaint relates; and

        iii. a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.

4. NOTIFICATION OF COMPLAINTS

1. The *Company* shall notify the *District Manager,* in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:

    a. a description of the nature of the complaint; and

    b. the time and date of the incident to which the complaint relates.

5. NOISE

1. The *Company* shall, at all times, ensure that the noise emissions from the *Facility* comply with the limits set out in *Ministry Publication NPC-300.*

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1 is included to require the *Company* to gather accurate information so that compliance with the *EPA,* the Regulations and this *Approval* can be verified.

2. Condition No. 2 is included to emphasize that the *Equipment* must be maintained and operated according to a procedure that will result in compliance with the *EPA,* the Regulations and this *Approval.*

3. Condition No. 3 is included to require the *Company* to keep records and to provide information to staff of the *Ministry* so that compliance with the *EPA,* the Regulations and this *Approval* can be

verified.

4. Condition No. 4 is included to require the *Company* to notify staff of the *Ministry* so as to assist the *Ministry* with the review of the site's compliance.

5. Condition No. 5 is included to provide the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the *Facility.*

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 9023-BDCKBT issued on June 27, 2019

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1
of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 18th day of July, 2019

Jeffrey McKerrall, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

AB/
c: District Manager, MECP Barrie
Katherine Armstrong, Golder Associates Ltd.

Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.
Instructions: A complete checklist consists of:
(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
(b) completed contact information for the Competent Environmental Practitioner (CEP)
(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:
For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:
(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..
Definition of Surface water CEP:
A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Kitchener Park Landfill
Location (e.g. street address, lot, concession)	25 Kitchener Street Orillia, Ontario
GPS Location (taken within the property boundary at front gate/ front entry)	17 626360E 49388350N
Municipality	City of Orillia
Client and/or Site Owner	City of Orillia
Monitoring Period (Year)	2024
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	-
Director's Order No.:	-
Provincial Officer's Order No.:	-

Other:	No CofA. Report available upon request.		
Report Submission Frequency	(•) **Annual** ( ) **Other**		
The site is: **(Operation Status)**	( ) **Open** ( ) **Inactive** (•) **Closed**		
Is there an active waste transfer station at the site?	( ) **Yes** (•) **No**		
Does this WDS have a Closure Plan?	(•) **Not yet submitted** ( ) **Submitted and under review** ( ) **Submitted and approved**		
Total Approved Capacity	NA	*Units*	Cubic Metres
Maximum Approved Fill Rate	0	*Units*	Tonnes per Year
Total Waste Received within Monitoring Period (Year)	0	*Units*	Cubic Metres
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	0		
Estimated Remaining Capacity	0	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	Estimation		
Estimated Remaining Capacity *Date Last Determined*	1-Jan-1967		
Non-Hazardous Approved Waste Types	[X] Domestic [X] Industrial, Commercial & Institutional (IC&I) [ ] Source Separated Organics (Green Bin) [ ] Tires	[ ] Contaminated Soil [ ] Wood Waste [ ] Blue Box Material [ ] Processed Organics [ ] Leaf and Yard Waste	[ ] Food Processing/Preparation Operations Waste [ ] Hauled Sewage Other: tree brush and debris
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	None		

Year Site Opened *(enter the Calendar Year only)*	1943	**Current ECA Issue Date**	1-Jan-1967
Is your Site required to submit Financial Assurance?		○ **Yes** ◉ **No**	
Describe how your WDS is designed.		◉ Natural Attenuation only ○ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		○ **Yes** ◉ **No**	
If closed, specify ECA, control or authorizing document closure date:		It is not regulated under the Waste CofA/ECA process.	
Has the nature of the operations at the site changed during this monitoring period?	○ **Yes** ◉ **No**		
If yes, provide details:	na		

Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	◉ Yes ○ No

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:	◉ **Yes** ○ **No**	
2) All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/ control document(s):	○ **Yes** ○ **No** ◉ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document *, or Ministry concurrence.*	○ **Yes** ○ **No** ◉ **Not Applicable**

b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ **Yes** ○ **No** ◉ **Not Applicable**	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**

4) All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	**(•) Yes** **( ) No**	
Sampling and Monitoring Program Results/WDS Conditions and Assessment:		
5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/ or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.	**(•) Yes** **( ) No**	Not applicable. Ecological assessment of shoreline area indicates no permanent biota will be adversely affected
6) The site meets compliance and assessment criteria.	**( ) Yes** **(•) No**	The site is not covered by a CofA or ECA - Ecological assessment of shoreline area indicates no permanent biota will be adversely affected
7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	**(•) Yes** **( ) No**	

1) Is one or more of the following risk reduction practices in place at the site: ***(a)*** **There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or** ***(b)*** **There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or** ***(c)*** **The site meets the following two conditions (typically achieved after 15 years or longer of site operation):** ***i.*** **The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and** ***ii.*** **Seasonal and annual water levels and water quality fluctuations are well understood.**	◉ **Yes** ○ **No**	**Note which practice(s):**	☐ **(a)** ☐ **(b)** ☒ **(c)**
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ **Yes** ◉ **No** ○ **Not Applicable**	No CofA / ECA.	

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

30-Apr-2025

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/ are recommended:**	The landfill gas and passive-venting sampling program at the Kitchener Park Landfill should be discussed with the Ministry to confirm detailed assessment of air discharge is no longer required; details are provided in the conclusions and recommendations of this report.
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/are recommended:**	
Name:	Paul Dewaele, M.Sc., P.Eng.
Seal:	

Signature:		**Date:**	30-Apr-2025
CEP Contact Information:	Per below		
Company:	Northern Geo Environmental Ltd.		
Address:			
Telephone No.:	705-790-9447	Fax No. :	
E-mail Address:	pdewaele@northerngeo.ca		
Co-signers for additional expertise provided:			
Signature:		**Date:**	
Signature:		**Date:**	

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):	
Name (s)	Lake Simcoe. See report text.

Distance(s)	See report text.

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	◉ **Yes** ○ **No**	
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	○ **Yes** ○ **No** ◉ **Not applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry ECA or authorizing/control document *, or Ministry concurrence.*	○ **Yes** ○ **No** ◉ **Not Applicable**	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	○ **Yes** ○ **No** ◉ **Not Applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

4) All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	(◉) Yes ( ) No	

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):	(◉) Yes ( ) No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table on the following page or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
	Surface water not monitored	Ecological assessment of shoreline area indicates no permanent biota will be adversely affected
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	○ **Yes** ◉ **No**	

7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	◉ **Yes** ○ **No**	
8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):	◉ Yes ○ No ○ Not Known ○ Not Applicable	Ecological assessment of shoreline area indicates no permanent biota will be adversely affected by the groundwater discharge
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ **Yes** ○ **No** ◉ **Not Applicable**	

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

30-Apr-2025

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

(●) **No Changes to the monitoring program are recommended** ( ) **The following change(s) to the monitoring program is/are recommended:**	
(●) **No changes to the site design and operation are recommended** ( ) **The following change(s) to the site design and operation is/ are recommended:**	

CEP Signature	
Relevant Discipline	Licensed and practicing geo-environmental engineer.
Date:	30-Apr-2025
CEP Contact Information:	Per below.
Company:	Northern Geo Environmental Ltd
Address:	
Telephone No.:	705-790-9447
Fax No. :	
E-mail Address:	pdewaele@northerngeo.ca

Save As		**Print Form**

APPENDIX F

Passive Venting

Table F1
Summarry of the Landfill Gas Chemistry Results

	Location	GVP 1	GVP 2	GVP 3	GVP 1	GVP 2	GVP 3
	Units/Date	26th February 2024			14th November 2024		
Matrix gases							
Methane	ppm	7.0	57.0	2.0	67.0	720.0	2.0
Oxygen	% v/v	21.0	21.4	21.8	20.8	20.1	21.7
Carbon Monoxide	% v/v	<0.1	<0.1	<0.1	-	-	-
Carbon Dioxide	% v/v	0.60	0.40	<0.1	0.9	1.5	0.2
Hydrogen sulfide	ppmv	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Calculated Parameters							
Dichlorodifluoromethane (FREON 12)	µg/m³	2.45	3.20	2.15	8.28	7.36	1.98
1,2-Dichlorotetrafluoroethane	µg/m³	<1.2	<1.2	<1.2	<1.2	3.10	<1.2
Chloromethane	µg/m³	1.02	<0.62	1.09	<0.62	<0.62	0.89
Vinyl Chloride	µg/m³	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Chloroethane	µg/m³	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
1,3-Butadiene	µg/m³	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Trichlorofluoromethane (FREON 11)	µg/m³	<1.1	1.20	<1.1	<1.1	1.20	1.10
Ethanol (ethyl alcohol)	µg/m³	13.10	17.20	16.30	9.50	8.30	5.50
Trichlorotrifluoroethane	µg/m³	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
2-propanol	µg/m³	3.70	5.20	4.90	4.60	<2.5	<2.5
2-Propanone	µg/m³	7.90	7.10	8.60	11.70	4.80	5.00
Methyl Ethyl Ketone (2-Butanone)	µg/m³	3.82	3.20	3.78	0.84	<0.59	<0.59
Methyl Isobutyl Ketone	µg/m³	<0.82	<0.82	<0.82	7.13	<0.82	<0.82
Methyl Butyl Ketone (2-Hexanone)	µg/m³	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1
Methyl t-butyl ether (MTBE)	µg/m³	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72
Ethyl Acetate	µg/m³	4.10	5.20	4.70	<3.6	<3.6	<3.6
1,1-Dichloroethylene	µg/m³	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
cis-1,2-Dichloroethylene	µg/m³	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
trans-1,2-Dichloroethylene	µg/m³	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Methylene Chloride(Dichloromethane)	µg/m³	<2.1	<2.1	<2.1	<2.1	3.10	<2.1
Chloroform	µg/m³	<0.49	1.77	<0.49	1.25	1.46	<0.49
Carbon Tetrachloride	µg/m³	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63
1,1-Dichloroethane	µg/m³	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
1,2-Dichloroethane	µg/m³	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylene Dibromide	µg/m³	<0.77	<0.77	<0.77	<0.77	<0.77	<0.77
1,1,1-Trichloroethane	µg/m³	<0.55	<0.55	<0.55	<0.55	<0.55	<0.55
1,1,2-Trichloroethane	µg/m³	<0.55	<0.55	<0.55	<0.55	<0.55	<0.55
1,1,2,2-Tetrachloroethane	µg/m³	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69
cis-1,3-Dichloropropene	µg/m³	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
trans-1,3-Dichloropropene	µg/m³	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,2-Dichloropropane	µg/m³	<0.46	<0.46	<0.46	<0.46	<0.46	<0.46
Bromomethane	µg/m³	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromoform	µg/m³	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Bromodichloromethane	µg/m³	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Dibromochloromethane	µg/m³	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Trichloroethylene	µg/m³	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Tetrachloroethylene	µg/m³	<0.68	<0.68	<0.68	<0.68	1.24	<0.68
Benzene	µg/m³	0.54	0.47	0.68	<0.32	0.37	0.37
Toluene	µg/m³	2.96	3.87	3.44	6.50	10.80	9.05

Table F1
Summarry of the Landfill Gas Chemistry Results

	Location	GVP 1	GVP 2	GVP 3	GVP 1	GVP 2	GVP 3
	Units/Date	26th February 2024			14th November 2024		
Ethylbenzene	µg/m³	0.59	0.74	0.65	0.69	0.71	0.59
p+m-Xylene	µg/m³	2.10	2.74	2.33	2.92	2.91	2.28
o-Xylene	µg/m³	0.77	0.97	0.82	1.00	0.97	0.75
Styrene	µg/m³	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
4-ethyltoluene	µg/m³	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	µg/m³	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
1,2,4-Trimethylbenzene	µg/m³	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Chlorobenzene	µg/m³	<0.46	<0.46	<0.46	<0.46	<0.46	<0.46
Benzyl chloride	µg/m³	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6
1,3-Dichlorobenzene	µg/m³	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
1,4-Dichlorobenzene	µg/m³	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
1,2-Dichlorobenzene	µg/m³	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
1,2,4-Trichlorobenzene	µg/m³	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7
Hexachlorobutadiene	µg/m³	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3
Hexane	µg/m³	<0.70	<0.70	<0.70	0.82	3.45	<0.70
Heptane	µg/m³	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Cyclohexane	µg/m³	<0.69	<0.69	<0.69	<0.69	2.10	<0.69
Tetrahydrofuran	µg/m³	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,4-Dioxane	µg/m³	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6
Naphthalene	µg/m³	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	µg/m³	2.90	3.70	3.20	3.90	3.90	3.00
1,1,1,2-Tetrachloroethane	µg/m³	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69
Vinyl Bromide	µg/m³	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87
Propene	µg/m³	<1.7	<0.86	<1.4	<0.86	<5.2	<0.86
2,2,4-Trimethylpentane	µg/m³	<0.93	<0.93	<0.93	<0.93	<0.93	<0.93
Carbon Disulfide	µg/m³	<1.6	<1.6	<1.6	5.40	<1.6	<1.6
Vinyl Acetate	µg/m³	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70

Table F-2
Sources and Contaminants Identification Table

Source Information			Expected Contaminants	Significant (Yes or No)?	Modelled (Yes or No)?	Rationale
Source ID	Source Description or Title	General Location				
GVP1, GVP2, GVP3	Gas Venting Stack	Site	Landfill Gas Constituents	No	No	Emission rates of all contaminants found to be below negligibility criteria (Section 7.1.2 of ESDM Procedure Document)
MOUND	Landfill mound	Site	Landfill Gas Constituents	No	No	

Table F-3
Source Summary Table

Source Identifier	Source Description	Stack ID	Source Parameters						Emission Data						
			Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [X]	Stack Location [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
GVP1	Gas Venting Stack	STCK1	0.0034	Ambient	0.10	6.0	626208.82	4938716.94	Methane	74-82-8	1.50E-04	1,24, Annual	EF	Average	6%
									Carbon Monoxide	630-08-0	3.91E-03	1,24, Annual	EF	Average	30%
									Hydrogen sulfide	7783-06-4	3.81E-06	1,24, Annual	EF	Average	30%
									Dichlorodifluoromethane (FREON 12)	75-71-8	2.83E-08	1,24, Annual	EF	Average	38%
									1,2-Dichlorotetrafluoroethane	76-14-2	4.10E-09	1,24, Annual	EF	Average	18%
									Chloromethane	74-87-3	3.48E-09	1,24, Annual	EF	Average	36%
									Vinyl Chloride	75-01-4	8.88E-10	1,24, Annual	EF	Average	30%
									Chloroethane	75-00-3	2.70E-09	1,24, Annual	EF	Average	30%
									1,3-Butadiene	106-99-0	3.76E-09	1,24, Annual	EF	Average	30%
									Trichlorofluoromethane (FREON 11)	75-69-4	3.76E-09	1,24, Annual	EF	Average	29%
									Ethanol (ethyl alcohol)	64-17-5	4.47E-08	1,24, Annual	EF	Average	26%
									Trichlorotrifluoroethane	26523-64-8	4.10E-09	1,24, Annual	EF	Average	30%
									2-propanol	67-63-0	1.57E-08	1,24, Annual	EF	Average	28%
									2-Propanone	67-64-1	4.00E-08	1,24, Annual	EF	Average	39%
									Methyl Ethyl Ketone (2-Butanone)	78-93-3	1.30E-08	1,24, Annual	EF	Average	33%
									Methyl Isobutyl Ketone	108-10-1	2.43E-08	1,24, Annual	EF	Average	67%
									Methyl Butyl Ketone (2-Hexanone)	591-78-6	1.40E-08	1,24, Annual	EF	Average	30%
									Methyl t-butyl ether (MTBE)	1634-04-4	2.46E-09	1,24, Annual	EF	Average	30%
									Ethyl Acetate	141-78-6	1.40E-08	1,24, Annual	EF	Average	27%
									1,1-Dichloroethylene	75-35-4	1.37E-09	1,24, Annual	EF	Average	30%
									cis-1,2-Dichloroethylene	156-59-2	1.37E-09	1,24, Annual	EF	Average	30%
									trans-1,2-Dichloroethylene	156-60-5	1.37E-09	1,24, Annual	EF	Average	30%
									Methylene Chloride(Dichloromethane)	75-09-2	7.17E-09	1,24, Annual	EF	Average	25%
									Chloroform	67-66-3	4.27E-09	1,24, Annual	EF	Average	29%
									Carbon Tetrachloride	56-23-5	2.15E-09	1,24, Annual	EF	Average	30%
									1,1-Dichloroethane	75-34-3	1.37E-09	1,24, Annual	EF	Average	30%
									1,2-Dichloroethane	107-06-2	1.37E-09	1,24, Annual	EF	Average	30%
									Ethylene Dibromide	106-93-4	2.63E-09	1,24, Annual	EF	Average	30%
									1,1,1-Trichloroethane	71-55-6	1.88E-09	1,24, Annual	EF	Average	30%
									1,1,2-Trichloroethane	79-00-5	1.88E-09	1,24, Annual	EF	Average	30%
									1,1,2,2-Tetrachloroethane	79-34-5	2.36E-09	1,24, Annual	EF	Average	30%
									cis-1,3-Dichloropropene	10061-01-5	1.54E-09	1,24, Annual	EF	Average	30%
									trans-1,3-Dichloropropene	10061-02-6	1.54E-09	1,24, Annual	EF	Average	30%
									1,2-Dichloropropane	78-87-5	1.57E-09	1,24, Annual	EF	Average	30%
									Bromomethane	74-83-9	1.33E-09	1,24, Annual	EF	Average	30%
									Bromoform	75-25-2	7.17E-09	1,24, Annual	EF	Average	30%
									Bromodichloromethane	75-27-4	4.44E-09	1,24, Annual	EF	Average	30%
									Dibromochloromethane	124-48-1	5.80E-09	1,24, Annual	EF	Average	30%
									Trichloroethylene	79-01-6	1.84E-09	1,24, Annual	EF	Average	30%
									Tetrachloroethylene	127-18-4	2.32E-09	1,24, Annual	EF	Average	23%
									Benzene	71-43-2	1.84E-09	1,24, Annual	EF	Average	30%
									Toluene	108-88-3	2.22E-08	1,24, Annual	EF	Average	22%
									Ethylbenzene	100-41-4	2.36E-09	1,24, Annual	EF	Average	30%
									p+m-Xylene	106-42-3	9.97E-09	1,24, Annual	EF	Average	32%
									o-Xylene	95-47-6	3.41E-09	1,24, Annual	EF	Average	32%
									Styrene	100-42-5	1.47E-09	1,24, Annual	EF	Average	30%
									4-ethyltoluene	622-96-8	8.54E-09	1,24, Annual	EF	Average	30%
									1,3,5-Trimethylbenzene	108-67-8	8.54E-09	1,24, Annual	EF	Average	30%
									1,2,4-Trimethylbenzene	95-63-6	8.54E-09	1,24, Annual	EF	Average	30%
									Chlorobenzene	108-90-7	1.57E-09	1,24, Annual	EF	Average	30%
									Benzyl chloride	100-44-7	8.88E-09	1,24, Annual	EF	Average	30%
									1,3-Dichlorobenzene	541-73-1	8.19E-09	1,24, Annual	EF	Average	30%
									1,4-Dichlorobenzene	106-46-7	2.05E-09	1,24, Annual	EF	Average	30%
									1,2-Dichlorobenzene	95-50-1	2.05E-09	1,24, Annual	EF	Average	30%
									1,2,4-Trichlorobenzene	120-82-1	1.26E-08	1,24, Annual	EF	Average	30%
									Hexachlorobutadiene	87-68-3	1.81E-08	1,24, Annual	EF	Average	30%
									Hexane	110-54-3	2.80E-09	1,24, Annual	EF	Average	13%
									Heptane	142-82-5	4.10E-09	1,24, Annual	EF	Average	30%
									Cyclohexane	110-82-7	2.36E-09	1,24, Annual	EF	Average	17%
									Tetrahydrofuran	109-99-9	4.10E-09	1,24, Annual	EF	Average	30%
									1,4-Dioxane	123-91-1	1.23E-08	1,24, Annual	EF	Average	30%
									Naphthalene	91-20-3	3.41E-09	1,24, Annual	EF	Average	30%
									Total Xylenes	1330-20-7	1.33E-08	1,24, Annual	EF	Average	32%
									1,1,1,2-Tetrachloroethane	630-20-6	2.36E-09	1,24, Annual	EF	Average	30%
									Vinyl Bromide	593-60-2	2.97E-09	1,24, Annual	EF	Average	30%
									Propene	115-07-1	4.78E-09	1,24, Annual	EF	Average	30%
									2,2,4-Trimethylpentane	540-84-1	3.18E-09	1,24, Annual	EF	Average	30%
									Carbon Disulfide	75-15-0	1.84E-08	1,24, Annual	EF	Average	54%
									Vinyl Acetate	108-05-4	2.39E-09	1,24, Annual	EF	Average	30%

Table F-3
Source Summary Table

Source Identifier	Source Description	Stack ID	Source Parameters						Emission Data						
			Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [X]	Stack Location [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
GVP2	Gas Venting Stack	STCK2	0.0037	Ambient	0.10	6.0	626294.93	4938791.07	Methane	74-82-8	1.73E-03	1,24, Annual	EF	Average	74%
									Carbon Monoxide	630-08-0	4.20E-03	1,24, Annual	EF	Average	33%
									Hydrogen sulfide	7783-06-4	4.09E-06	1,24, Annual	EF	Average	33%
									Dichlorodifluoromethane (FREON 12)	75-71-8	2.70E-08	1,24, Annual	EF	Average	36%
									1,2-Dichlorotetrafluoroethane	76-14-2	1.14E-08	1,24, Annual	EF	Average	51%
									Chloromethane	74-87-3	2.27E-09	1,24, Annual	EF	Average	23%
									Vinyl Chloride	75-01-4	9.53E-10	1,24, Annual	EF	Average	33%
									Chloroethane	75-00-3	2.90E-09	1,24, Annual	EF	Average	33%
									1,3-Butadiene	106-99-0	4.03E-09	1,24, Annual	EF	Average	33%
									Trichlorofluoromethane (FREON 11)	75-69-4	4.40E-09	1,24, Annual	EF	Average	34%
									Ethanol (ethyl alcohol)	64-17-5	6.31E-08	1,24, Annual	EF	Average	36%
									Trichlorotrifluoroethane	26523-64-8	4.40E-09	1,24, Annual	EF	Average	33%
									2-propanol	67-63-0	1.91E-08	1,24, Annual	EF	Average	35%
									2-Propanone	67-64-1	2.60E-08	1,24, Annual	EF	Average	25%
									Methyl Ethyl Ketone (2-Butanone)	78-93-3	1.17E-08	1,24, Annual	EF	Average	29%
									Methyl Isobutyl Ketone	108-10-1	3.01E-09	1,24, Annual	EF	Average	8%
									Methyl Butyl Ketone (2-Hexanone)	591-78-6	1.50E-08	1,24, Annual	EF	Average	33%
									Methyl t-butyl ether (MTBE)	1634-04-4	2.64E-09	1,24, Annual	EF	Average	33%
									Ethyl Acetate	141-78-6	1.91E-08	1,24, Annual	EF	Average	36%
									1,1-Dichloroethylene	75-35-4	1.47E-09	1,24, Annual	EF	Average	33%
									cis-1,2-Dichloroethylene	156-59-2	1.47E-09	1,24, Annual	EF	Average	33%
									trans-1,2-Dichloroethylene	156-60-5	1.47E-09	1,24, Annual	EF	Average	33%
									Methylene Chloride(Dichloromethane)	75-09-2	1.14E-08	1,24, Annual	EF	Average	40%
									Chloroform	67-66-3	6.49E-09	1,24, Annual	EF	Average	44%
									Carbon Tetrachloride	56-23-5	2.31E-09	1,24, Annual	EF	Average	33%
									1,1-Dichloroethane	75-34-3	1.47E-09	1,24, Annual	EF	Average	33%
									1,2-Dichloroethane	107-06-2	1.47E-09	1,24, Annual	EF	Average	33%
									Ethylene Dibromide	106-93-4	2.82E-09	1,24, Annual	EF	Average	33%
									1,1,1-Trichloroethane	71-55-6	2.02E-09	1,24, Annual	EF	Average	33%
									1,1,2-Trichloroethane	79-00-5	2.02E-09	1,24, Annual	EF	Average	33%
									1,1,2,2-Tetrachloroethane	79-34-5	2.53E-09	1,24, Annual	EF	Average	33%
									cis-1,3-Dichloropropene	10061-01-5	1.65E-09	1,24, Annual	EF	Average	33%
									trans-1,3-Dichloropropene	10061-02-6	1.65E-09	1,24, Annual	EF	Average	33%
									1,2-Dichloropropane	78-87-5	1.69E-09	1,24, Annual	EF	Average	33%
									Bromomethane	74-83-9	1.43E-09	1,24, Annual	EF	Average	33%
									Bromoform	75-25-2	7.70E-09	1,24, Annual	EF	Average	33%
									Bromodichloromethane	75-27-4	4.77E-09	1,24, Annual	EF	Average	33%
									Dibromochloromethane	124-48-1	6.23E-09	1,24, Annual	EF	Average	33%
									Trichloroethylene	79-01-6	1.98E-09	1,24, Annual	EF	Average	33%
									Tetrachloroethylene	127-18-4	4.55E-09	1,24, Annual	EF	Average	45%
									Benzene	71-43-2	1.72E-09	1,24, Annual	EF	Average	28%
									Toluene	108-88-3	3.96E-08	1,24, Annual	EF	Average	40%
									Ethylbenzene	100-41-4	2.71E-09	1,24, Annual	EF	Average	34%
									p+m-Xylene	106-42-3	1.07E-08	1,24, Annual	EF	Average	34%
									o-Xylene	95-47-6	3.56E-09	1,24, Annual	EF	Average	33%
									Styrene	100-42-5	1.58E-09	1,24, Annual	EF	Average	33%
									4-ethyltoluene	622-96-8	9.17E-09	1,24, Annual	EF	Average	33%
									1,3,5-Trimethylbenzene	108-67-8	9.17E-09	1,24, Annual	EF	Average	33%
									1,2,4-Trimethylbenzene	95-63-6	9.17E-09	1,24, Annual	EF	Average	33%
									Chlorobenzene	108-90-7	1.69E-09	1,24, Annual	EF	Average	33%
									Benzyl chloride	100-44-7	9.53E-09	1,24, Annual	EF	Average	33%
									1,3-Dichlorobenzene	541-73-1	8.80E-09	1,24, Annual	EF	Average	33%
									1,4-Dichlorobenzene	106-46-7	2.20E-09	1,24, Annual	EF	Average	33%
									1,2-Dichlorobenzene	95-50-1	2.20E-09	1,24, Annual	EF	Average	33%
									1,2,4-Trichlorobenzene	120-82-1	1.36E-08	1,24, Annual	EF	Average	33%
									Hexachlorobutadiene	87-68-3	1.94E-08	1,24, Annual	EF	Average	33%
									Hexane	110-54-3	1.27E-08	1,24, Annual	EF	Average	60%
									Heptane	142-82-5	4.40E-09	1,24, Annual	EF	Average	33%
									Cyclohexane	110-82-7	7.70E-09	1,24, Annual	EF	Average	54%
									Tetrahydrofuran	109-99-9	4.40E-09	1,24, Annual	EF	Average	33%
									1,4-Dioxane	123-91-1	1.32E-08	1,24, Annual	EF	Average	33%
									Naphthalene	91-20-3	3.67E-09	1,24, Annual	EF	Average	33%
									Total Xylenes	1330-20-7	1.43E-08	1,24, Annual	EF	Average	34%
									1,1,1,2-Tetrachloroethane	630-20-6	2.53E-09	1,24, Annual	EF	Average	33%
									Vinyl Bromide	593-60-2	3.19E-09	1,24, Annual	EF	Average	33%
									Propene	115-07-1	5.13E-09	1,24, Annual	EF	Average	33%
									2,2,4-Trimethylpentane	540-84-1	3.41E-09	1,24, Annual	EF	Average	33%
									Carbon Disulfide	75-15-0	5.87E-09	1,24, Annual	EF	Average	17%
									Vinyl Acetate	108-05-4	2.57E-09	1,24, Annual	EF	Average	33%

Table F-3
Source Summary Table

Source Identifier	Source Description	Stack ID	Source Parameters						Emission Data						
			Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [X]	Stack Location [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
GVP3	Gas Venting Stack	STCK3	0.0019	Ambient	0.10	6.0	626375.14	4938843.37	Methane	74-82-8	2.50E-06	1,24, Annual	EF	Average	<1%
									Carbon Monoxide	630-08-0	2.19E-03	1,24, Annual	EF	Average	17%
									Hydrogen sulfide	7783-06-4	2.13E-06	1,24, Annual	EF	Average	17%
									Dichlorodifluoromethane (FREON 12)	75-71-8	4.10E-09	1,24, Annual	EF	Average	6%
									1,2-Dichlorotetrafluoroethane	76-14-2	2.29E-09	1,24, Annual	EF	Average	10%
									Chloromethane	74-87-3	2.08E-09	1,24, Annual	EF	Average	21%
									Vinyl Chloride	75-01-4	4.96E-10	1,24, Annual	EF	Average	17%
									Chloroethane	75-00-3	1.51E-09	1,24, Annual	EF	Average	17%
									1,3-Butadiene	106-99-0	2.10E-09	1,24, Annual	EF	Average	17%
									Trichlorofluoromethane (FREON 11)	75-69-4	2.10E-09	1,24, Annual	EF	Average	16%
									Ethanol (ethyl alcohol)	64-17-5	3.11E-08	1,24, Annual	EF	Average	18%
									Trichlorotrifluoroethane	26523-64-8	2.29E-09	1,24, Annual	EF	Average	17%
									2-propanol	67-63-0	9.35E-09	1,24, Annual	EF	Average	17%
									2-Propanone	67-64-1	1.64E-08	1,24, Annual	EF	Average	16%
									Methyl Ethyl Ketone (2-Butanone)	78-93-3	7.22E-09	1,24, Annual	EF	Average	18%
									Methyl Isobutyl Ketone	108-10-1	1.57E-09	1,24, Annual	EF	Average	4%
									Methyl Butyl Ketone (2-Hexanone)	591-78-6	7.83E-09	1,24, Annual	EF	Average	17%
									Methyl t-butyl ether (MTBE)	1634-04-4	1.37E-09	1,24, Annual	EF	Average	17%
									Ethyl Acetate	141-78-6	8.97E-09	1,24, Annual	EF	Average	17%
									1,1-Dichloroethylene	75-35-4	7.64E-10	1,24, Annual	EF	Average	17%
									cis-1,2-Dichloroethylene	156-59-2	7.64E-10	1,24, Annual	EF	Average	17%
									trans-1,2-Dichloroethylene	156-60-5	7.64E-10	1,24, Annual	EF	Average	17%
									Methylene Chloride(Dichloromethane)	75-09-2	4.01E-09	1,24, Annual	EF	Average	14%
									Chloroform	67-66-3	9.35E-10	1,24, Annual	EF	Average	6%
									Carbon Tetrachloride	56-23-5	1.20E-09	1,24, Annual	EF	Average	17%
									1,1-Dichloroethane	75-34-3	7.64E-10	1,24, Annual	EF	Average	17%
									1,2-Dichloroethane	107-06-2	7.64E-10	1,24, Annual	EF	Average	17%
									Ethylene Dibromide	106-93-4	1.47E-09	1,24, Annual	EF	Average	17%
									1,1,1-Trichloroethane	71-55-6	1.05E-09	1,24, Annual	EF	Average	17%
									1,1,2-Trichloroethane	79-00-5	1.05E-09	1,24, Annual	EF	Average	17%
									1,1,2,2-Tetrachloroethane	79-34-5	1.32E-09	1,24, Annual	EF	Average	17%
									cis-1,3-Dichloropropene	10061-01-5	8.59E-10	1,24, Annual	EF	Average	17%
									trans-1,3-Dichloropropene	10061-02-6	8.59E-10	1,24, Annual	EF	Average	17%
									1,2-Dichloropropane	78-87-5	8.78E-10	1,24, Annual	EF	Average	17%
									Bromomethane	74-83-9	7.45E-10	1,24, Annual	EF	Average	17%
									Bromoform	75-25-2	4.01E-09	1,24, Annual	EF	Average	17%
									Bromodichloromethane	75-27-4	2.48E-09	1,24, Annual	EF	Average	17%
									Dibromochloromethane	124-48-1	3.25E-09	1,24, Annual	EF	Average	17%
									Trichloroethylene	79-01-6	1.03E-09	1,24, Annual	EF	Average	17%
									Tetrachloroethylene	127-18-4	1.30E-09	1,24, Annual	EF	Average	13%
									Benzene	71-43-2	1.30E-09	1,24, Annual	EF	Average	21%
									Toluene	108-88-3	1.73E-08	1,24, Annual	EF	Average	17%
									Ethylbenzene	100-41-4	1.24E-09	1,24, Annual	EF	Average	16%
									p+m-Xylene	106-42-3	4.45E-09	1,24, Annual	EF	Average	14%
									o-Xylene	95-47-6	1.57E-09	1,24, Annual	EF	Average	15%
									Styrene	100-42-5	8.21E-10	1,24, Annual	EF	Average	17%
									4-ethyltoluene	622-96-8	4.77E-09	1,24, Annual	EF	Average	17%
									1,3,5-Trimethylbenzene	108-67-8	4.77E-09	1,24, Annual	EF	Average	17%
									1,2,4-Trimethylbenzene	95-63-6	4.77E-09	1,24, Annual	EF	Average	17%
									Chlorobenzene	108-90-7	8.78E-10	1,24, Annual	EF	Average	17%
									Benzyl chloride	100-44-7	4.96E-09	1,24, Annual	EF	Average	17%
									1,3-Dichlorobenzene	541-73-1	4.58E-09	1,24, Annual	EF	Average	17%
									1,4-Dichlorobenzene	106-46-7	1.15E-09	1,24, Annual	EF	Average	17%
									1,2-Dichlorobenzene	95-50-1	1.15E-09	1,24, Annual	EF	Average	17%
									1,2,4-Trichlorobenzene	120-82-1	7.06E-09	1,24, Annual	EF	Average	17%
									Hexachlorobutadiene	87-68-3	1.01E-08	1,24, Annual	EF	Average	17%
									Hexane	110-54-3	1.34E-09	1,24, Annual	EF	Average	6%
									Heptane	142-82-5	2.29E-09	1,24, Annual	EF	Average	17%
									Cyclohexane	110-82-7	1.32E-09	1,24, Annual	EF	Average	9%
									Tetrahydrofuran	109-99-9	2.29E-09	1,24, Annual	EF	Average	17%
									1,4-Dioxane	123-91-1	6.87E-09	1,24, Annual	EF	Average	17%
									Naphthalene	91-20-3	1.91E-09	1,24, Annual	EF	Average	17%
									Total Xylenes	1330-20-7	6.11E-09	1,24, Annual	EF	Average	14%
									1,1,1,2-Tetrachloroethane	630-20-6	1.32E-09	1,24, Annual	EF	Average	17%
									Vinyl Bromide	593-60-2	1.66E-09	1,24, Annual	EF	Average	17%
									Propene	115-07-1	2.67E-09	1,24, Annual	EF	Average	17%
									2,2,4-Trimethylpentane	540-84-1	1.78E-09	1,24, Annual	EF	Average	17%
									Carbon Disulfide	75-15-0	3.05E-09	1,24, Annual	EF	Average	9%
									Vinyl Acetate	108-05-4	1.34E-09	1,24, Annual	EF	Average	17%
MOUND	Landfill	MOUND	N/A	N/A	N/A	N/A	N/A	N/A	Methane	74-82-8	4.71E-04	1,24, Annual	EF	Average	20%
									Carbon Monoxide	630-08-0	2.57E-03	1,24, Annual	EF	Average	20%
									Hydrogen sulfide	7783-06-4	2.51E-06	1,24, Annual	EF	Average	20%
									Dichlorodifluoromethane (FREON 12)	75-71-8	1.48E-08	1,24, Annual	EF	Average	20%
									1,2-Dichlorotetrafluoroethane	76-14-2	4.44E-09	1,24, Annual	EF	Average	20%
									Chloromethane	74-87-3	1.96E-09	1,24, Annual	EF	Average	20%
									Vinyl Chloride	75-01-4	5.84E-10	1,24, Annual	EF	Average	20%
									Chloroethane	75-00-3	1.78E-09	1,24, Annual	EF	Average	20%

Table F-3
Source Summary Table

Source Identifier	Source Description	Stack ID	Source Parameters						Emission Data							
			Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [X]	Stack Location [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
									1,3-Butadiene	106-99-0	2.47E-09	1,24, Annual	EF	Average	20%
									Trichlorofluoromethane (FREON 11)	75-69-4	2.56E-09	1,24, Annual	EF	Average	20%
									Ethanol (ethyl alcohol)	64-17-5	3.47E-08	1,24, Annual	EF	Average	20%
									Trichlorotrifluoroethane	26523-64-8	2.70E-09	1,24, Annual	EF	Average	20%
									2-propanol	67-63-0	1.10E-08	1,24, Annual	EF	Average	20%
									2-Propanone	67-64-1	2.06E-08	1,24, Annual	EF	Average	20%
									Methyl Ethyl Ketone (2-Butanone)	78-93-3	8.00E-09	1,24, Annual	EF	Average	20%
									Methyl Isobutyl Ketone	108-10-1	7.23E-09	1,24, Annual	EF	Average	20%
									Methyl Butyl Ketone (2-Hexanone)	591-78-6	9.22E-09	1,24, Annual	EF	Average	20%
									Methyl t-butyl ether (MTBE)	1634-04-4	1.62E-09	1,24, Annual	EF	Average	20%
									Ethyl Acetate	141-78-6	1.05E-08	1,24, Annual	EF	Average	20%
									1,1-Dichloroethylene	75-35-4	8.99E-10	1,24, Annual	EF	Average	20%
									cis-1,2-Dichloroethylene	156-59-2	8.99E-10	1,24, Annual	EF	Average	20%
									trans-1,2-Dichloroethylene	156-60-5	8.99E-10	1,24, Annual	EF	Average	20%
									Methylene Chloride(Dichloromethane)	75-09-2	5.64E-09	1,24, Annual	EF	Average	20%
									Chloroform	67-66-3	2.92E-09	1,24, Annual	EF	Average	20%
									Carbon Tetrachloride	56-23-5	1.42E-09	1,24, Annual	EF	Average	20%
									1,1-Dichloroethane	75-34-3	8.99E-10	1,24, Annual	EF	Average	20%
									1,2-Dichloroethane	107-06-2	8.99E-10	1,24, Annual	EF	Average	20%
									Ethylene Dibromide	106-93-4	1.73E-09	1,24, Annual	EF	Average	20%
									1,1,1-Trichloroethane	71-55-6	1.24E-09	1,24, Annual	EF	Average	20%
									1,1,2-Trichloroethane	79-00-5	1.24E-09	1,24, Annual	EF	Average	20%
									1,1,2,2-Tetrachloroethane	79-34-5	1.55E-09	1,24, Annual	EF	Average	20%
									cis-1,3-Dichloropropene	10061-01-5	1.01E-09	1,24, Annual	EF	Average	20%
									trans-1,3-Dichloropropene	10061-02-6	1.01E-09	1,24, Annual	EF	Average	20%
									1,2-Dichloropropane	78-87-5	1.03E-09	1,24, Annual	EF	Average	20%
									Bromomethane	74-83-9	8.77E-10	1,24, Annual	EF	Average	20%
									Bromoform	75-25-2	4.72E-09	1,24, Annual	EF	Average	20%
									Bromodichloromethane	75-27-4	2.92E-09	1,24, Annual	EF	Average	20%
									Dibromochloromethane	124-48-1	3.82E-09	1,24, Annual	EF	Average	20%
									Trichloroethylene	79-01-6	1.21E-09	1,24, Annual	EF	Average	20%
									Tetrachloroethylene	127-18-4	2.04E-09	1,24, Annual	EF	Average	20%
									Benzene	71-43-2	1.22E-09	1,24, Annual	EF	Average	20%
									Toluene	108-88-3	1.98E-08	1,24, Annual	EF	Average	20%
									Ethylbenzene	100-41-4	1.58E-09	1,24, Annual	EF	Average	20%
									p+m-Xylene	106-42-3	6.27E-09	1,24, Annual	EF	Average	20%
									o-Xylene	95-47-6	2.13E-09	1,24, Annual	EF	Average	20%
									Styrene	100-42-5	9.66E-10	1,24, Annual	EF	Average	20%
									4-ethyltoluene	622-96-8	5.62E-09	1,24, Annual	EF	Average	20%
									1,3,5-Trimethylbenzene	108-67-8	5.62E-09	1,24, Annual	EF	Average	20%
									1,2,4-Trimethylbenzene	95-63-6	5.62E-09	1,24, Annual	EF	Average	20%
									Chlorobenzene	108-90-7	1.03E-09	1,24, Annual	EF	Average	20%
									Benzyl chloride	100-44-7	5.84E-09	1,24, Annual	EF	Average	20%
									1,3-Dichlorobenzene	541-73-1	5.39E-09	1,24, Annual	EF	Average	20%
									1,4-Dichlorobenzene	106-46-7	1.35E-09	1,24, Annual	EF	Average	20%
									1,2-Dichlorobenzene	95-50-1	1.35E-09	1,24, Annual	EF	Average	20%
									1,2,4-Trichlorobenzene	120-82-1	8.32E-09	1,24, Annual	EF	Average	20%
									Hexachlorobutadiene	87-68-3	1.19E-08	1,24, Annual	EF	Average	20%
									Hexane	110-54-3	4.20E-09	1,24, Annual	EF	Average	20%
									Heptane	142-82-5	2.70E-09	1,24, Annual	EF	Average	20%
									Cyclohexane	110-82-7	2.84E-09	1,24, Annual	EF	Average	20%
									Tetrahydrofuran	109-99-9	2.70E-09	1,24, Annual	EF	Average	20%
									1,4-Dioxane	123-91-1	8.09E-09	1,24, Annual	EF	Average	20%
									Naphthalene	91-20-3	2.25E-09	1,24, Annual	EF	Average	20%
									Total Xylenes	1330-20-7	8.43E-09	1,24, Annual	EF	Average	20%
									1,1,1,2-Tetrachloroethane	630-20-6	1.55E-09	1,24, Annual	EF	Average	20%
									Vinyl Bromide	593-60-2	1.96E-09	1,24, Annual	EF	Average	20%
									Propene	115-07-1	3.15E-09	1,24, Annual	EF	Average	20%
									2,2,4-Trimethylpentane	540-84-1	2.09E-09	1,24, Annual	EF	Average	20%
									Carbon Disulfide	75-15-0	6.84E-09	1,24, Annual	EF	Average	20%
									Vinyl Acetate	108-05-4	1.57E-09	1,24, Annual	EF	Average	20%

Table F-4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Modelling Source Data						Emissions Data			
			Stack Height [m]	Stack Temperature [K]	Stack Velocity [m/s]	Exit Diameter [m]	Source Coordinate [X]	Source Coordinate [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
GVP1	STCK1	Point	6.0	Ambient	0.4070	0.10	626208.82	4938716.94	All contaminants screened out as per MECP Emission Threshold procedure as outlined in Section 7.1.2 of the ESDM Procedure Document (Guideline A-10)			
GVP2	STCK2	Point	6.0	Ambient	0.34	0.10	626294.93	4938791.07	All contaminants screened out as per MECP Emission Threshold procedure as outlined in Section 7.1.2 of the ESDM Procedure Document (Guideline A-10)			
GVP3	STCK3	Point	6.0	Ambient	0.31	0.10	626375.14	4938843.37	All contaminants screened out as per MECP Emission Threshold procedure as outlined in Section 7.1.2 of the ESDM Procedure Document (Guideline A-10)			

Modelling ID	Source ID(s)	Source Type	Modelling Source Data						Emissions Data			
			Release Height [m]	Initial Vertical Dimension [m]	Number of vertices	Area [m²]	Source Coordinate [X]	Source Coordinate [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s/m²]	Averaging Period [hours]
MOUND	Landfill	MOUND	0	0	38	64196	Various	Various	All contaminants screened out as per MECP Emission Threshold procedure as outlined in Section 7.1.2 of the ESDM Procedure Document (Guideline A-10)			

Table F-5
Emission Summary Table

Contaminant	CASNo.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Percentage of MECP Limit [%]	Version of Date of ACB List
All contaminants determined to be negligible as per the MECP Threshold Emission Calculation outlined in Section 7.1.2 of the ESDM Procedure Document. All values below ACB Version 3.0 (April 2023) values or below de minimus values as applicable.												

Source	landfill Mound
Source ID	MOUND
Source Description	The system includes a barrier and passive venting system, which will incorporate horizontal gas venting trenches, routing the gas produced to three LFG venting stacks.
Methodology	
	The Passive venting system is antciipated to have a collection efficiency of 80%, therefore, emissions from the mound were estimated based on the measured emissions from the stacks

Source Parameters

Collection efficiency	80%

Sample Calculations

Emission Rate from Mound (Methane):

Emission Rate of Methane (g/s) = Total Emission Rate from vents (g/s)x (1-collection efficiency (%)) /collection efficiency (%)

$$\text{Emission Rate of Methane (g/s)} = \frac{1.885\text{E-}03 \ \frac{g}{s}}{20\%} \times 80\%$$

$$\text{Emission Rate of Methane (g/s)} = 4.71\text{E-}04 \ \frac{g}{s}$$

Emission Rate

Gas / Pollutant	CAS Number	Total Venting Emission Rate	Mound Emission Rate
		g/s	g/s
Methane	74-82-8	1.88E-03	4.71E-04
Carbon Monoxide	630-08-0	1.03E-02	2.57E-03
Hydrogen sulfide	7783-06-4	1.00E-05	2.51E-06
Dichlorodifluoromethane (FREON 12)	75-71-8	5.94E-08	1.48E-08
1,2-Dichlorotetrafluoroethane	76-14-2	1.78E-08	4.44E-09
Chloromethane	74-87-3	7.84E-09	1.96E-09
Vinyl Chloride	75-01-4	2.34E-09	5.84E-10
Chloroethane	75-00-3	7.10E-09	1.78E-09
1,3-Butadiene	106-99-0	9.89E-09	2.47E-09
Trichlorofluoromethane (FREON 11)	75-69-4	1.03E-08	2.56E-09
Ethanol (ethyl alcohol)	64-17-5	1.39E-07	3.47E-08
Trichlorotrifluoroethane	26523-64-8	1.08E-08	2.70E-09
2-propanol	67-63-0	4.41E-08	1.10E-08
2-Propanone	67-64-1	8.24E-08	2.06E-08
Methyl Ethyl Ketone (2-Butanone)	78-93-3	3.20E-08	8.00E-09
Methyl Isobutyl Ketone	108-10-1	2.89E-08	7.23E-09
Methyl Butyl Ketone (2-Hexanone)	591-78-6	3.69E-08	9.22E-09
Methyl t-butyl ether (MTBE)	1634-04-4	6.47E-09	1.62E-09
Ethyl Acetate	141-78-6	4.20E-08	1.05E-08
1,1-Dichloroethylene	75-35-4	3.60E-09	8.99E-10
cis-1,2-Dichloroethylene	156-59-2	3.60E-09	8.99E-10
trans-1,2-Dichloroethylene	156-60-5	3.60E-09	8.99E-10
Methylene Chloride(Dichloromethane)	75-09-2	2.25E-08	5.64E-09
Chloroform	67-66-3	1.17E-08	2.92E-09
Carbon Tetrachloride	56-23-5	5.66E-09	1.42E-09
1,1-Dichloroethane	75-34-3	3.60E-09	8.99E-10
1,2-Dichloroethane	107-06-2	3.60E-09	8.99E-10
Ethylene Dibromide	106-93-4	6.92E-09	1.73E-09
1,1,1-Trichloroethane	71-55-6	4.94E-09	1.24E-09
1,1,2-Trichloroethane	79-00-5	4.94E-09	1.24E-09
1,1,2,2-Tetrachloroethane	79-34-5	6.20E-09	1.55E-09
cis-1,3-Dichloropropene	10061-01-5	4.05E-09	1.01E-09
trans-1,3-Dichloropropene	10061-02-6	4.05E-09	1.01E-09
1,2-Dichloropropane	78-87-5	4.14E-09	1.03E-09
Bromomethane	74-83-9	3.51E-09	8.77E-10
Bromoform	75-25-2	1.89E-08	4.72E-09
Bromodichloromethane	75-27-4	1.17E-08	2.92E-09
Dibromochloromethane	124-48-1	1.53E-08	3.82E-09
Trichloroethylene	79-01-6	4.85E-09	1.21E-09
Tetrachloroethylene	127-18-4	8.17E-09	2.04E-09
Benzene	71-43-2	4.87E-09	1.22E-09
Toluene	108-88-3	7.91E-08	1.98E-08
Ethylbenzene	100-41-4	6.31E-09	1.58E-09
p+m-Xylene	106-42-3	2.51E-08	6.27E-09
o-Xylene	95-47-6	8.54E-09	2.13E-09
Styrene	100-42-5	3.87E-09	9.66E-10
4-ethyltoluene	622-96-8	2.25E-08	5.62E-09
1,3,5-Trimethylbenzene	108-67-8	2.25E-08	5.62E-09
1,2,4-Trimethylbenzene	95-63-6	2.25E-08	5.62E-09
Chlorobenzene	108-90-7	4.14E-09	1.03E-09
Benzyl chloride	100-44-7	2.34E-08	5.84E-09
1,3-Dichlorobenzene	541-73-1	2.16E-08	5.39E-09
1,4-Dichlorobenzene	106-46-7	5.39E-09	1.35E-09
1,2-Dichlorobenzene	95-50-1	5.39E-09	1.35E-09
1,2,4-Trichlorobenzene	120-82-1	3.33E-08	8.32E-09
Hexachlorobutadiene	87-68-3	4.77E-08	1.19E-08
Hexane	110-54-3	1.68E-08	4.20E-09
Heptane	142-82-5	1.08E-08	2.70E-09
Cyclohexane	110-82-7	1.14E-08	2.84E-09
Tetrahydrofuran	109-99-9	1.08E-08	2.70E-09
1,4-Dioxane	123-91-1	3.24E-08	8.09E-09
Naphthalene	91-20-3	8.99E-09	2.25E-09
Total Xylenes	1330-20-7	3.37E-08	8.43E-09
1,1,1,2-Tetrachloroethane	630-20-6	6.20E-09	1.55E-09
Vinyl Bromide	593-60-2	7.82E-09	1.96E-09
Propene	115-07-1	1.26E-08	3.15E-09
2,2,4-Trimethylpentane	540-84-1	8.36E-09	2.09E-09
Carbon Disulfide	75-15-0	2.74E-08	6.84E-09
Vinyl Acetate	108-05-4	6.29E-09	1.57E-09

Source: LFG Collection System

Source ID: GVP1, GVP2, GVP3

Source Description: The system includes a barrier and passive venting system, which will incorporate horizontal gas venting trenches, routing the gas produced to three LFG venting stacks.

Methodology

Emission rates from the three vents were calculated from the twice annual sampling rounds. The maximum measured concentration from each sampling round was used for modelling. Where a VOC was not measured above the detection limit, the detection limit was used for conservatism

Source Parameters

	GVP1		GVP2		GVP3	
Date	Flow Rate (CFM)	Flow Rate (m^3/s)	Flow Rate (CFM)	Flow Rate (m^3/s)	Flow Rate (CFM)	Flow Rate (m^3/s)
23-Feb-24	5.07	2.39E-03	2.76	1.30E-03	2.64	1.25E-03
14-Nov-24	9.40	4.44E-03	12.78	6.03E-03	5.45	2.57E-03
AVERAGE	7.24	3.41E-03	7.77	3.67E-03	4.05	1.91E-03

Sample Calculations

Emission Rate (Trichlorotrifluoroethane from GVP1):

Emission Rate of Trichlorotrifluoroethane (g/s) = Emission Rate ($\mu g/m^3$) x flow rate (m^3/s) x conversion to g/s

$$\text{Emission Rate of Trichlorotrifluoroethane (g/s)} = \frac{1.200\text{E+00}\ \mu g}{m^3} \left| \frac{0.0034\ m^3}{s} \right| \frac{1\ g}{1{,}000{,}000\ \mu g}$$

$$\text{Emission Rate of Trichlorotrifluoroethane (g/s)} = \frac{4.10\text{E-09}\ g}{s}$$

Emission Rate

Gas / Pollutant	CAS Number	Source Testing Results [in ppm]									Molecular weight
		GVP1			GVP2			GVP3			
		Round 1	Round 2	Max	Round 1	Round 2	Max	Round 1	Round 2	Max	
Methane	74-82-8	7.00	67.00	67.00	57.00	720.00	720.00	2.00	2.00	2.00	16.04
Carbon monoxide (%V/V)	7783-06-4	0.10	-	0.10	0.10	-	0.10	0.10	-	0.10	28.01
Hydrogen sulfide	76-14-2	0.40	0.80	0.80	0.40	0.80	0.80	0.40	0.80	0.80	34.08

Gas / Pollutant	CAS Number	GVP1				GVP2				GVP3			
		Round 1 (µg/m³)	Round 2 (µg/m³)	Max	Emission Rate (g/s)	Round 1 (µg/m³)	Round 2 (µg/m³)	Max	Emission Rate (g/s)	Round 1 (µg/m³)	Round 2 (µg/m³)	Max	Emission Rate (g/s)
Methane	74-82-8	4.59E+03	4.40E+04	4.40E+04	1.50E-04	3.74E+04	4.72E+05	4.72E+05	1.73E-03	1.31E+03	1.31E+03	1.31E+03	2.50E-06
Carbon Monoxide	630-08-0	1.15E+06	-	1.15E+06	3.91E-03	1.15E+06	-	1.15E+06	4.20E-03	1.15E+06	-	1.15E+06	2.19E-03
Hydrogen sulfide	7783-06-4	5.58E+02	1.12E+03	1.12E+03	3.81E-06	3.33E-01	1.12E+03	1.12E+03	4.09E-06	5.58E+02	1.12E+03	1.12E+03	2.13E-06
Dichlorodifluoromethane (FREON 12)	75-71-8	2.45E+00	8.28E+00	8.28E+00	2.83E-08	3.20E+00	7.36E+00	7.36E+00	2.70E-08	2.15E+00	1.98E+00	2.15E+00	4.10E-09
1,2-Dichlorotetrafluoroethane	76-14-2	1.20E+00	1.20E+00	1.20E+00	4.10E-09	1.20E+00	3.10E+00	3.10E+00	1.14E-08	1.20E+00	1.20E+00	1.20E+00	2.29E-09
Chloromethane	74-87-3	1.02E+00	6.20E-01	1.02E+00	3.48E-09	6.20E-01	6.20E-01	6.20E-01	2.27E-09	1.09E+00	8.90E-01	1.09E+00	2.08E-09
Vinyl Chloride	75-01-4	2.60E-01	2.60E-01	2.60E-01	8.88E-10	2.60E-01	2.60E-01	2.60E-01	9.53E-10	2.60E-01	2.60E-01	2.60E-01	4.96E-10
Chloroethane	75-00-3	7.90E-01	7.90E-01	7.90E-01	2.70E-09	7.90E-01	7.90E-01	7.90E-01	2.90E-09	7.90E-01	7.90E-01	7.90E-01	1.51E-09
1,3-Butadiene	106-99-0	1.10E+00	1.10E+00	1.10E+00	3.76E-09	1.10E+00	1.10E+00	1.10E+00	4.03E-09	1.10E+00	1.10E+00	1.10E+00	2.10E-09
Trichlorofluoromethane (FREON 11)	75-69-4	1.10E+00	1.10E+00	1.10E+00	3.76E-09	1.20E+00	1.20E+00	1.20E+00	4.40E-09	1.10E+00	1.10E+00	1.10E+00	2.10E-09
Ethanol (ethyl alcohol)	64-17-5	1.31E+01	9.50E+00	1.31E+01	4.47E-08	1.72E+01	8.30E+00	1.72E+01	6.31E-08	1.63E+01	5.50E+00	1.63E+01	3.11E-08
Trichlorotrifluoroethane	26523-64-8	1.20E+00	1.20E+00	1.20E+00	4.10E-09	1.20E+00	1.20E+00	1.20E+00	4.40E-09	1.20E+00	1.20E+00	1.20E+00	2.29E-09
2-propanol	67-63-0	3.70E+00	4.60E+00	4.60E+00	1.57E-08	5.20E+00	2.50E+00	5.20E+00	1.91E-08	4.90E+00	2.50E+00	4.90E+00	9.35E-09
2-Propanone	67-64-1	7.90E+00	1.17E+01	1.17E+01	4.00E-08	7.10E+00	4.80E+00	7.10E+00	2.60E-08	8.60E+00	5.00E+00	8.60E+00	1.64E-08
Methyl Ethyl Ketone (2-Butanone)	78-93-3	3.82E+00	8.40E-01	3.82E+00	1.30E-08	3.20E+00	5.90E-01	3.20E+00	1.17E-08	3.78E+00	5.90E-01	3.78E+00	7.22E-09
Methyl Isobutyl Ketone	108-10-1	8.20E-01	7.13E+00	7.13E+00	2.43E-08	8.20E-01	8.20E-01	8.20E-01	3.01E-09	8.20E-01	8.20E-01	8.20E-01	1.57E-09
Methyl Butyl Ketone (2-Hexanone)	591-78-6	4.10E+00	4.10E+00	4.10E+00	1.40E-08	4.10E+00	4.10E+00	4.10E+00	1.50E-08	4.10E+00	4.10E+00	4.10E+00	7.83E-09
Methyl t-butyl ether (MTBE)	1634-04-4	7.20E-01	7.20E-01	7.20E-01	2.46E-09	7.20E-01	7.20E-01	7.20E-01	2.64E-09	7.20E-01	7.20E-01	7.20E-01	1.37E-09
Ethyl Acetate	141-78-6	4.10E+00	3.60E+00	4.10E+00	1.40E-08	5.20E+00	3.60E+00	5.20E+00	1.91E-08	4.70E+00	3.60E+00	4.70E+00	8.97E-09
1,1-Dichloroethylene	75-35-4	4.00E-01	4.00E-01	4.00E-01	1.37E-09	4.00E-01	4.00E-01	4.00E-01	1.47E-09	4.00E-01	4.00E-01	4.00E-01	7.64E-10
cis-1,2-Dichloroethylene	156-59-2	4.00E-01	4.00E-01	4.00E-01	1.37E-09	4.00E-01	4.00E-01	4.00E-01	1.47E-09	4.00E-01	4.00E-01	4.00E-01	7.64E-10
trans-1,2-Dichloroethylene	156-60-5	4.00E-01	4.00E-01	4.00E-01	1.37E-09	4.00E-01	4.00E-01	4.00E-01	1.47E-09	4.00E-01	4.00E-01	4.00E-01	7.64E-10
Methylene Chloride(Dichloromethane)	75-09-2	2.10E+00	2.10E+00	2.10E+00	7.17E-09	2.10E+00	3.10E+00	3.10E+00	1.14E-08	2.10E+00	2.10E+00	2.10E+00	4.01E-09
Chloroform	67-66-3	4.90E-01	1.25E+00	1.25E+00	4.27E-09	1.77E+00	1.46E+00	1.77E+00	6.49E-09	4.90E-01	4.90E-01	4.90E-01	9.35E-10
Carbon Tetrachloride	56-23-5	6.30E-01	6.30E-01	6.30E-01	2.15E-09	6.30E-01	6.30E-01	6.30E-01	2.31E-09	6.30E-01	6.30E-01	6.30E-01	1.20E-09
1,1-Dichloroethane	75-34-3	4.00E-01	4.00E-01	4.00E-01	1.37E-09	4.00E-01	4.00E-01	4.00E-01	1.47E-09	4.00E-01	4.00E-01	4.00E-01	7.64E-10
1,2-Dichloroethane	107-06-2	4.00E-01	4.00E-01	4.00E-01	1.37E-09	4.00E-01	4.00E-01	4.00E-01	1.47E-09	4.00E-01	4.00E-01	4.00E-01	7.64E-10
Ethylene Dibromide	106-93-4	7.70E-01	7.70E-01	7.70E-01	2.63E-09	7.70E-01	7.70E-01	7.70E-01	2.82E-09	7.70E-01	7.70E-01	7.70E-01	1.47E-09
1,1,1-Trichloroethane	71-55-6	5.50E-01	5.50E-01	5.50E-01	1.88E-09	5.50E-01	5.50E-01	5.50E-01	2.02E-09	5.50E-01	5.50E-01	5.50E-01	1.05E-09
1,1,2-Trichloroethane	79-00-5	5.50E-01	5.50E-01	5.50E-01	1.88E-09	5.50E-01	5.50E-01	5.50E-01	2.02E-09	5.50E-01	5.50E-01	5.50E-01	1.05E-09
1,1,2,2-Tetrachloroethane	79-34-5	6.90E-01	6.90E-01	6.90E-01	2.36E-09	6.90E-01	6.90E-01	6.90E-01	2.53E-09	6.90E-01	6.90E-01	6.90E-01	1.32E-09
cis-1,3-Dichloropropene	10061-01-5	4.50E-01	4.50E-01	4.50E-01	1.54E-09	4.50E-01	4.50E-01	4.50E-01	1.65E-09	4.50E-01	4.50E-01	4.50E-01	8.59E-10
trans-1,3-Dichloropropene	10061-02-6	4.50E-01	4.50E-01	4.50E-01	1.54E-09	4.50E-01	4.50E-01	4.50E-01	1.65E-09	4.50E-01	4.50E-01	4.50E-01	8.59E-10
1,2-Dichloropropane	78-87-5	4.60E-01	4.60E-01	4.60E-01	1.57E-09	4.60E-01	4.60E-01	4.60E-01	1.69E-09	4.60E-01	4.60E-01	4.60E-01	8.78E-10
Bromomethane	74-83-9	3.90E-01	3.90E-01	3.90E-01	1.33E-09	3.90E-01	3.90E-01	3.90E-01	1.43E-09	3.90E-01	3.90E-01	3.90E-01	7.45E-10
Bromoform	75-25-2	2.10E+00	2.10E+00	2.10E+00	7.17E-09	2.10E+00	2.10E+00	2.10E+00	7.70E-09	2.10E+00	2.10E+00	2.10E+00	4.01E-09
Bromodichloromethane	75-27-4	1.30E+00	1.30E+00	1.30E+00	4.44E-09	1.30E+00	1.30E+00	1.30E+00	4.77E-09	1.30E+00	1.30E+00	1.30E+00	2.48E-09
Dibromochloromethane	124-48-1	1.70E+00	1.70E+00	1.70E+00	5.80E-09	1.70E+00	1.70E+00	1.70E+00	6.23E-09	1.70E+00	1.70E+00	1.70E+00	3.25E-09
Trichloroethylene	79-01-6	5.40E-01	5.40E-01	5.40E-01	1.84E-09	5.40E-01	5.40E-01	5.40E-01	1.98E-09	5.40E-01	5.40E-01	5.40E-01	1.03E-09
Tetrachloroethylene	127-18-4	6.80E-01	6.80E-01	6.80E-01	2.32E-09	6.80E-01	1.24E+00	1.24E+00	4.55E-09	6.80E-01	6.80E-01	6.80E-01	1.30E-09
Benzene	71-43-2	5.40E-01	3.20E-01	5.40E-01	1.84E-09	4.70E-01	3.70E-01	4.70E-01	1.72E-09	6.80E-01	3.70E-01	6.80E-01	1.30E-09
Toluene	108-88-3	2.96E+00	6.50E+00	6.50E+00	2.22E-08	3.87E+00	1.08E+01	1.08E+01	3.96E-08	3.44E+00	9.05E+00	9.05E+00	1.73E-08
Ethylbenzene	100-41-4	5.90E-01	6.90E-01	6.90E-01	2.36E-09	7.40E-01	7.10E-01	7.40E-01	2.71E-09	6.50E-01	5.90E-01	6.50E-01	1.24E-09
p+m-Xylene	106-42-3	2.10E+00	2.92E+00	2.92E+00	9.97E-09	2.74E+00	2.91E+00	2.91E+00	1.07E-08	2.33E+00	2.28E+00	2.33E+00	4.45E-09
o-Xylene	95-47-6	7.70E-01	1.00E+00	1.00E+00	3.41E-09	9.70E-01	9.70E-01	9.70E-01	3.56E-09	8.20E-01	7.50E-01	8.20E-01	1.57E-09
Styrene	100-42-5	4.30E-01	4.30E-01	4.30E-01	1.47E-09	4.30E-01	4.30E-01	4.30E-01	1.58E-09	4.30E-01	4.30E-01	4.30E-01	8.21E-10
4-ethyltoluene	622-96-8	2.50E+00	2.50E+00	2.50E+00	8.54E-09	2.50E+00	2.50E+00	2.50E+00	9.17E-09	2.50E+00	2.50E+00	2.50E+00	4.77E-09
1,3,5-Trimethylbenzene	108-67-8	2.50E+00	2.50E+00	2.50E+00	8.54E-09	2.50E+00	2.50E+00	2.50E+00	9.17E-09	2.50E+00	2.50E+00	2.50E+00	4.77E-09
1,2,4-Trimethylbenzene	95-63-6	2.50E+00	2.50E+00	2.50E+00	8.54E-09	2.50E+00	2.50E+00	2.50E+00	9.17E-09	2.50E+00	2.50E+00	2.50E+00	4.77E-09
Chlorobenzene	108-90-7	4.60E-01	4.60E-01	4.60E-01	1.57E-09	4.60E-01	4.60E-01	4.60E-01	1.69E-09	4.60E-01	4.60E-01	4.60E-01	8.78E-10
Benzyl chloride	100-44-7	2.60E+00	2.60E+00	2.60E+00	8.88E-09	2.60E+00	2.60E+00	2.60E+00	9.53E-09	2.60E+00	2.60E+00	2.60E+00	4.96E-09
1,3-Dichlorobenzene	541-73-1	2.40E+00	2.40E+00	2.40E+00	8.19E-09	2.40E+00	2.40E+00	2.40E+00	8.80E-09	2.40E+00	2.40E+00	2.40E+00	4.58E-09
1,4-Dichlorobenzene	106-46-7	6.00E-01	6.00E-01	6.00E-01	2.05E-09	6.00E-01	6.00E-01	6.00E-01	2.20E-09	6.00E-01	6.00E-01	6.00E-01	1.15E-09
1,2-Dichlorobenzene	95-50-1	6.00E-01	6.00E-01	6.00E-01	2.05E-09	6.00E-01	6.00E-01	6.00E-01	2.20E-09	6.00E-01	6.00E-01	6.00E-01	1.15E-09
1,2,4-Trichlorobenzene	120-82-1	3.70E+00	3.70E+00	3.70E+00	1.26E-08	3.70E+00	3.70E+00	3.70E+00	1.36E-08	3.70E+00	3.70E+00	3.70E+00	7.06E-09
Hexachlorobutadiene	87-68-3	5.30E+00	5.30E+00	5.30E+00	1.81E-08	5.30E+00	5.30E+00	5.30E+00	1.94E-08	5.30E+00	5.30E+00	5.30E+00	1.01E-08
Hexane	110-54-3	7.00E-01	8.20E-01	8.20E-01	2.80E-09	7.00E-01	3.45E+00	3.45E+00	1.27E-08	7.00E-01	7.00E-01	7.00E-01	1.34E-09
Heptane	142-82-5	1.20E+00	1.20E+00	1.20E+00	4.10E-09	1.20E+00	1.20E+00	1.20E+00	4.40E-09	1.20E+00	1.20E+00	1.20E+00	2.29E-09
Cyclohexane	110-82-7	6.90E-01	6.90E-01	6.90E-01	2.36E-09	6.90E-01	2.10E+00	2.10E+00	7.70E-09	6.90E-01	6.90E-01	6.90E-01	1.32E-09
Tetrahydrofuran	109-99-9	1.20E+00	1.20E+00	1.20E+00	4.10E-09	1.20E+00	1.20E+00	1.20E+00	4.40E-09	1.20E+00	1.20E+00	1.20E+00	2.29E-09
1,4-Dioxane	123-91-1	3.60E+00	3.60E+00	3.60E+00	1.23E-08	3.60E+00	3.60E+00	3.60E+00	1.32E-08	3.60E+00	3.60E+00	3.60E+00	6.87E-09
Naphthalene	91-20-3	1.00E+00	1.00E+00	1.00E+00	3.41E-09	1.00E+00	1.00E+00	1.00E+00	3.67E-09	1.00E+00	1.00E+00	1.00E+00	1.91E-09
Total Xylenes	1330-20-7	2.90E+00	3.90E+00	3.90E+00	1.33E-08	3.70E+00	3.90E+00	3.90E+00	1.43E-08	3.20E+00	3.00E+00	3.20E+00	6.11E-09
1,1,1,2-Tetrachloroethane	630-20-6	6.90E-01	6.90E-01	6.90E-01	2.36E-09	6.90E-01	6.90E-01	6.90E-01	2.53E-09	6.90E-01	6.90E-01	6.90E-01	1.32E-09
Vinyl Bromide	593-60-2	8.70E-01	8.70E-01	8.70E-01	2.97E-09	8.70E-01	8.70E-01	8.70E-01	3.19E-09	8.70E-01	8.70E-01	8.70E-01	1.66E-09
Propene	115-07-1	1.40E+00	8.60E-01	1.40E+00	4.78E-09	1.40E+00	8.60E-01	1.40E+00	5.13E-09	1.40E+00	8.60E-01	1.40E+00	2.67E-09
2,2,4-Trimethylpentane	540-84-1	9.30E-01	9.30E-01	9.30E-01	3.18E-09	9.30E-01	9.30E-01	9.30E-01	3.41E-09	9.30E-01	9.30E-01	9.30E-01	1.78E-09
Carbon Disulfide	75-15-0	1.60E+00	5.40E+00	5.40E+00	1.84E-08	1.60E+00	1.60E+00	1.60E+00	5.87E-09	1.60E+00	1.60E+00	1.60E+00	3.05E-09
Vinyl Acetate	108-05-4	7.00E-01	7.00E-01	7.00E-01	2.39E-09	7.00E-01	7.00E-01	7.00E-01	2.57E-09	7.00E-01	7.00E-01	7.00E-01	1.34E-09

Appendix F
Screening for Negligibility Summary

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Averaging Period	Ministry POI Limit [µg/m³]	Regulation Schedule	Source	Emission Threshold [g/s]	Negligibility Assessment
1,1,1,2-Tetrachloroethane	630-20-6	7.75E-09	24-hour	0.5	Sch. 3	SL-JSL	7.00E-05	Negligible
1,1,1-Trichloroethane	71-55-6	6.18E-09	24-hour	115000	Sch. 3	Standard	1.61E+01	Negligible
1,1,2,2-Tetrachloroethane	79-34-5	7.75E-09	24-hour	0.1	Sch. 3	SL-JSL	1.40E-05	Negligible
1,1,2-Trichloroethane	79-00-5	6.18E-09	24-hour	0.3	Sch. 3	SL-JSL	4.20E-05	Negligible
1,1-Dichloroethane	75-34-3	4.50E-09	24-hour	165	Sch. 3	Standard	2.31E-02	Negligible
1,1-Dichloroethane	75-34-3	4.50E-09	24-hour	1650	Sch. 6	URT	2.31E-01	—
1,1-Dichloroethylene	75-35-4	4.50E-09	24-hour	10	Sch. 3	Standard	1.40E-03	Negligible
1,2,4-Trichlorobenzene	120-82-1	4.16E-08	24-hour	400	Sch. 3	Guideline	5.60E-02	Negligible
1,2,4-Trimethylbenzene	95-63-6	2.81E-08	24-hour	220	Sch. 3	Standard	3.08E-02	Negligible
1,2,4-Trimethylbenzene	95-63-6	2.81E-08	24-hour	2200	Sch. 6	URT	3.08E-01	—
1,2-Dichlorobenzene	95-50-1	6.74E-09	1-hour	30500	Sch. 3	Guideline	1.75E+00	Negligible
1,2-Dichloroethane	107-06-2	4.50E-09	24-hour	2	Sch. 3	Standard	2.80E-04	Negligible
1,2-Dichloroethane	107-06-2	4.50E-09	24-hour	200	Sch. 6	URT	2.80E-02	Negligible
1,2-Dichloropropane	78-87-5	5.17E-09	24-hour	2400	Sch. 3	Guideline	3.36E-01	Negligible
1,2-Dichlorotetrafluoroethane	76-14-2	2.22E-08	24-hour	700000	Sch. 3	Guideline	9.80E+01	Negligible
1,3,5-Trimethylbenzene	108-67-8	2.81E-08	24-hour	220	Sch. 3	Standard	3.08E-02	Negligible
1,3,5-Trimethylbenzene	108-67-8	2.81E-08	24-hour	2200	Sch. 6	URT	3.08E-01	Negligible
1,3-Butadiene	106-99-0	1.24E-08	Annual	2	Sch. 3	Standard	1.46E-03	Negligible
1,3-Butadiene	106-99-0	1.24E-08	24-hour	300	Sch. 6	URT	4.20E-02	Negligible
1,3-Butadiene	106-99-0	1.24E-08	Annual	20	—	AAV	1.46E-02	Negligible
1,3-Dichlorobenzene	541-73-1	2.70E-08	24-hour	50	Sch. 3	SL-JSL	7.00E-03	Negligible
1,4-Dichlorobenzene	106-46-7	6.74E-09	24-hour	95	Sch. 3	Standard	1.33E-02	Negligible
1,4-Dichlorobenzene	106-46-7	6.74E-09	24-hour	950	Sch. 6	URT	1.33E-01	Negligible
1,4-Dioxane	123-91-1	4.05E-08	24-hour	3500	Sch. 3	Guideline	4.90E-01	Negligible
2,2,4-Trimethylpentane	540-84-1	1.05E-08	24-hour	1750	Sch. 3	SL-JSL	2.45E-01	Negligible
2-propanol	67-63-0	5.52E-08	24-hour	7300	Sch. 3	Standard	1.02E+00	Negligible
2-propanol	67-63-0	5.52E-08	24-hour	73000	Sch. 6	URT	1.02E+01	Negligible
2-Propanone	67-64-1	1.03E-07	24-hour	11880	Sch. 3	Standard	1.66E+00	Negligible
2-Propanone	67-64-1	1.03E-07	24-hour	118800	Sch. 6	URT	1.66E+01	Negligible
4-ethyltoluene	622-96-8	2.81E-08	24-hour	625	Sch. 3	SL-JSL	8.75E-02	Negligible
Benzene	71-43-2	6.08E-09	Annual	0.45	Sch. 3	Standard	3.29E-04	Negligible
Benzene	71-43-2	6.08E-09	24-hour	100	Sch. 6	URT	1.40E-02	Negligible
Benzene	71-43-2	6.08E-09	Annual	4.5	—	AAV	3.29E-03	Negligible
Benzyl chloride	100-44-7	2.92E-08	24-hour	0.1	Sch. 3	SL-JSL	1.40E-05	Negligible
Bromodichloromethane	75-27-4	1.46E-08	24-hour	350	Sch. 3	SL-JSL	4.90E-02	Negligible
Bromoform	75-25-2	2.36E-08	24-hour	55	Sch. 3	Guideline	7.70E-03	Negligible
Bromomethane	74-83-9	4.38E-09	24-hour	1350	Sch. 3	Guideline	1.89E-01	Negligible
Carbon dioxide	124-38-9	0.00E+00	24-hour	255800	Sch. 3	SL-PA	3.58E+01	Negligible
Carbon Disulphide	75-15-0	3.42E-08	24-hour	330	Sch. 3	Guideline	4.62E-02	Negligible
Carbon Tetrachloride	56-23-5	7.08E-09	24-hour	2.4	Sch. 3	Standard	3.36E-04	Negligible
Carbon Tetrachloride	56-23-5	7.08E-09	24-hour	24	Sch. 6	URT	3.36E-03	Negligible
Carbon Monoxide	630-08-0	1.29E-02	1/2-hour	6000	Sch. 3	B1	2.84E-01	Negligible
Chlorobenzene	108-90-7	5.17E-09	1-hour	3500	Sch. 3	Guideline	2.01E-01	Negligible
Chlorobenzene	108-90-7	5.17E-09	10-minute	4500	Sch. 3	Guideline	1.57E-01	Negligible
Chloroethane	75-00-3	8.88E-09	24-hour	5600	Sch. 3	Standard	7.84E-01	Negligible
Chloroethane	75-00-3	8.88E-09	24-hour	25000	Sch. 6	URT	3.50E+00	Negligible
Chloroform	67-66-3	1.46E-08	24-hour	1	Sch. 3	Standard	1.40E-04	Negligible
Chloroform	67-66-3	1.46E-08	24-hour	100	Sch. 6	URT	1.40E-02	Negligible
Chloromethane	74-87-3	9.80E-09	24-hour	320	Sch. 3	Standard	4.48E-02	Negligible
Chloromethane	74-87-3	9.80E-09	24-hour	3200	Sch. 6	URT	4.48E-01	Negligible
cis-1,2-Dichloroethylene	156-59-2	4.50E-09	24-hour	105	Sch. 3	Guideline	1.47E-02	Negligible
cis-1,3-Dichloropropene	10061-01-5	5.06E-09	24-hour	22.5	Sch. 3	SL-JSL	3.15E-03	Negligible
Cyclohexane	110-82-7	1.42E-08	24-hour	6100	Sch. 3	Standard	8.54E-01	Negligible
Cyclohexane	110-82-7	1.42E-08	24-hour	61000	Sch. 6	URT	8.54E+00	Negligible
Dibromochloromethane	124-48-1	1.91E-08	24-hour	0.2	Sch. 3	SL-JSL	2.80E-05	Negligible
Dichlorodifluoromethane (FREON12)	75-71-8	7.42E-08	24-hour	500000	Sch. 3	Guideline	7.00E+01	Negligible
Ethanol (ethyl alcohol)	64-17-5	1.74E-07	1-hour	19000	Sch. 3	Guideline	1.09E+00	Negligible
Ethyl Acetate	141-78-6	5.26E-08	1-hour	19000	Sch. 3	Guideline	1.09E+00	Negligible
Ethylbenzene	100-41-4	7.89E-09	24-hour	1000	Sch. 3	Standard	1.40E-01	Negligible
Ethylbenzene	100-41-4	7.89E-09	10-minute	1900	Sch. 3	Guideline	6.61E-02	Negligible
Ethylbenzene	100-41-4	7.89E-09	24-hour	10000	Sch. 6	URT	1.40E+00	Negligible
Ethylene Dibromide	106-93-4	8.65E-09	24-hour	3	Sch. 3	Guideline	4.20E-04	Negligible
Heptane	142-82-5	1.35E-08	24-hour	11000	Sch. 3	Standard	1.54E+00	Negligible
Hexachlorobutadiene	87-68-3	5.96E-08	24-hour	0.225	Sch. 3	SL-JSL	3.15E-05	Negligible
Hexane	110-54-3	2.10E-08	24-hour	7500	Sch. 3	Standard	1.05E+00	Negligible
Hexane	110-54-3	2.10E-08	24-hour	25000	Sch. 6	URT	3.50E+00	Negligible
Hexane	110-54-3	2.10E-08	24-hour	25000	Sch. 6	URT	3.50E+00	Negligible
Hydrogen Sulphide	7783-06-4	1.25E-05	24-hour	7	Sch. 3	Standard	9.80E-04	Negligible
Hydrogen Sulphide	7783-06-4	1.25E-05	10-minute	13	Sch. 3	Standard	4.52E-04	Negligible
Hydrogen Sulphide	7783-06-4	1.25E-05	24-hour	70	Sch. 6	URT	9.80E-03	Negligible
Methane	74-82-8	2.36E-03	24-hour	37330	Sch. 3	SL-PA	5.22E+00	Negligible
Methyl Butyl Ketone (2-Hexanone)	591-78-6	4.61E-08	24-hour	150	Sch. 3	SL-JSL	2.10E-02	Negligible
Methyl Ethyl Ketone (2-Butanone)	78-93-3	4.00E-08	24-hour	1000	Sch. 3	Standard	1.40E-01	Negligible
Methyl Ethyl Ketone (2-Butanone)	78-93-3	4.00E-08	24-hour	10000	Sch. 6	URT	1.40E+00	Negligible
Methyl Isobutyl Ketone	108-10-1	3.61E-08	24-hour	1200	Sch. 3	Guideline	1.68E-01	Negligible
Methyl t-butyl ether (MTBE)	1634-04-4	8.09E-09	24-hour	7000	Sch. 3	Guideline	9.80E-01	Negligible
Methylene Chloride(Dichloromethane)	75-09-2	2.82E-08	24-hour	220	Sch. 3	Standard	3.08E-02	Negligible
Methylene Chloride(Dichloromethane)	75-09-2	2.82E-08	24-hour	22000	Sch. 6	URT	3.08E+00	Negligible
Naphthalene	91-20-3	1.12E-08	24-hour	22.5	Sch. 3	Guideline	3.15E-03	Negligible
Naphthalene	91-20-3	1.12E-08	10-minute	50	Sch. 3	Guideline	1.74E-03	Negligible
o-Xylene	95-47-6	1.07E-08	24-hour	0.1	—	De Minimus	1.40E-05	Negligible
p+m-Xylene	106-42-3	3.14E-08	24-hour	0.1	—	De Minimus	1.40E-05	Negligible
Propene	115-07-1	1.57E-08	24-hour	4000	Sch. 3	Standard	5.60E-01	Negligible
Propene	115-07-1	1.57E-08	24-hour	40000	Sch. 6	URT	5.60E+00	Negligible

Appendix F
Screening for Negligibility Summary

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Averaging Period	Ministry POI Limit [µg/m³]	Regulation Schedule	Source	Emission Threshold [g/s]	Negligibility Assessment
Styrene	100-42-5	4.83E-09	24-hour	400	Sch. 3	Standard	5.60E-02	Negligible
Tetrachloroethylene	127-18-4	1.02E-08	24-hour	360	Sch. 3	Standard	5.04E-02	Negligible
Tetrachloroethylene	127-18-4	1.02E-08	24-hour	3600	Sch. 6	URT	5.04E-01	Negligible
Tetrahydrofuran	109-99-9	1.35E-08	24-hour	93000	Sch. 3	Guideline	1.30E+01	Negligible
Toluene	108-88-3	9.88E-08	24-hour	2000	Sch. 3	Guideline	2.80E-01	Negligible
Total Xylenes	1330-20-7	4.22E-08	24-hour	730	Sch. 3	Standard	1.02E-01	Negligible
Total Xylenes	1330-20-7	4.22E-08	10-minute	3000	Sch. 3	Guideline	1.04E-01	Negligible
Total Xylenes	1330-20-7	4.22E-08	24-hour	7300	Sch. 6	URT	1.02E+00	Negligible
trans-1,2-Dichloroethylene	156-60-5	4.50E-09	24-hour	105	Sch. 3	Guideline	1.47E-02	Negligible
trans-1,3-Dichloropropene	10061-02-6	5.06E-09	24-hour	22.5	Sch. 3	SL-JSL	3.15E-03	Negligible
Trichloroethylene	79-01-6	6.07E-09	24-hour	12	Sch. 3	Standard	1.68E-03	Negligible
Trichloroethylene	79-01-6	6.07E-09	24-hour	1200	Sch. 6	URT	1.68E-01	Negligible
Trichlorofluoromethane (FREON11)	75-69-4	1.28E-08	24-hour	6000	Sch. 3	Guideline	8.40E-01	Negligible
Trichlorotrifluoroethane	26523-64-8	1.35E-08	24-hour	0.1	—	De Minimus	1.40E-05	Negligible
Vinyl Acetate	108-05-4	7.87E-09	24-hour	1000	Sch. 3	SL-JSL	1.40E-01	Negligible
Vinyl Bromide	593-60-2	9.78E-09	24-hour	0.1	—	De Minimus	1.40E-05	Negligible
Vinyl Chloride	75-01-4	2.92E-09	24-hour	1	Sch. 3	Standard	1.40E-04	Negligible
Vinyl Chloride	75-01-4	2.92E-09	24-hour	100	Sch. 6	URT	1.40E-02	Negligible

Note: Per Section 7.1.2 ii) of the Ministry's Procedure for Preparing an ESDM Report (March 2018), the Emission Threshold calculation cannot be used to screen out contaminants with Assessment Values or with URTs that have averaging periods different than their Standards.

Geographic Area Type	Urban
Distance from Source [m]	20

Averaging Period	Dispersion Factor [µg/m³ per g/s]
1-hour	8,700
10-minute	14,368
1/2-hour	10,563
24-hour	3,573
Annual	685
30-day	1,379

In accordance with Section 7.1.2 of the Ministry's Procedure for Preparing an ESDM Report (March 2018), in most cases, contaminants that are emitted from a specific facility may be identified as negligible when they are below emission thresholds that are developed using the following formula:

$$\text{Emission Threshold [g/s]} = \frac{0.5 \times \text{Ministry POI Limit [µg/m³]}}{\text{Dispersion Factor [µg/m³ per g/s]}}$$

Aggregate facility-wide emissions of a contaminant that are less than the calculated site-specific Emission Threshold may be considered negligible.

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