7.0 Monitoring, Reporting and Commitments

7.1 Environmental Effects Monitoring

An effective monitoring program ensures that the Ridge Landfill will work as expected, that mitigation measures are effective, and that unforeseen problems are identified and addressed. Monitoring programs provide assurance to the surrounding community that the facility is safe and potential environmental impacts are minimized.

As stated in **Section 1.0**, the Ridge Landfill is operating under ECA No. A021601. As part of Condition No. 9 in the ECA, there is currently monitoring programs for groundwater, off-site private wells, surface water, and the leachate and gas collection systems. The results of the monitoring programs are documented each year in the Annual Development, Operations and Monitoring Report for the Ridge Landfill site. In addition to the current monitoring programs, Waste Connections is proposing monitoring programs for the biological environment, and odour. It is noted that the monitoring program for odour will be further defined in conjunction with the ECA approval for the proposed Ridge Landfill expansion, in consultation with the MECP, and documented in subsequent Annual Development, Operations and Monitoring Reports.

Based on the assessment of potential environmental effects associated with the landfill expansion EA, the following monitoring programs will be carried out or will continue to be conducted. It is noted that the potential environmental effects associated with the agricultural, cultural heritage, archaeology, land use, transportation, and bird hazards to aviation safety components of the environment are mitigated through the measures identified in **Section 6.0**, therefore, no monitoring activities are proposed.

7.1.1 Biology

Alterations to the terrestrial and aquatic ecosystem have the potential to affect the biological components of the natural environment. Waste Connections will conduct the following monitoring activities during the construction and/or operation of the preferred alternative.

7.1.1.1 General (applicable to multiple areas)

Waste Connections will have a qualified person inspect the Erosion and Sediment Control (ESC) measures weekly during the construction phase and monthly during the landfill's operational phase. Deficiencies observed will be reported to the appropriate person (e.g., Landfill manager, contractor, designate) and repaired as soon as reasonably possible.

7.1.1.2 Endangered and Threatened Species (Provincial)

Biological net effects on the terrestrial ecosystem for the proposed expansion include potential impact on the habitat of Endangered or Threatened species, medicinal or culturally sensitive species of importance to Indigenous Communities and Organizations, and the terrestrial biological systems (e.g., vegetation, wildlife and wildlife habitat, significant woodlots).

Waste Connections will have a qualified person experienced in species identification (i.e., eastern meadowlark, barn swallow, SAR bats) on-site during vegetation clearing activities. Prior to the removal of potential barn swallow habitat, a qualified person will assess the structures for presence of barn swallow nest(s). As a mechanism to observe that the conditions of s23.5 under *O.Reg. 242/08* can be met, the assessment of the structures will take place between May 1 and August 1 the year prior to their proposed removal. A qualified person will also inspect the operational buffer demarcations associated with confirmed SAR habitat bi-annually during the operational phase. Deficiencies observed will be reported to the landfill manager (or designate) and repaired as soon as reasonably possible.

7.1.1.3 Medicinal or Culturally Sensitive Species of Importance to Indigenous Communities and Organizations

The removal of native species with the potential to provide medicinal properties for and/or are recognized as culturally sensitive species will be mitigated through restoration planting and naturalization of berms. Waste Connections will implement a tending program (including contingency measures) for a minimum of three (3) years to observe the success of the restoration and naturalization efforts. Waste Connections will consult with Indigenous Communities and Organizations to determine whether community members wish to take part in the tending program.

7.1.1.4 Wildlife and Wildlife Habitat (Non-SAR)

Waste Connections will have a qualified person trained in wildlife identification and wildlife Best Management Practices (BMP) on-site full-time during construction activities in the event wildlife is encountered.

7.1.1.5 Trees and Vegetation

Waste Connections will plant during the spring (March 15 to May 15) or fall (September 1 to October 31). Trees can be planted outside of these dates so long as the ground is not frozen and the warmest summer period has passed. Trees will be monitored bi-annually between May 15 and September 30 for a minimum of 3 years after planting to assess tree health. To promote tree

growth and overall health, trees will be tended to in accordance with the following:

- Tending activities will take place bi-weekly from May 15 to September 30 during the first three (3) growing seasons after planting;
- Vegetation will be maintained a minimum of 60 cm around the base of the trees until the trees are above the herbaceous vegetation;
- A watering plan will be in place for periods of drought or low rainfall; and
- Trees assessed as dead during the 3-year monitoring period will be replanted.

A record of tending will be maintained to include the following:

- Planting date(s);
- The date tending activities are completed and a description of the tending activity (e.g., vegetation maintenance); and
- An assessment of overall tree health (good, poor, dead) for each bi-annual monitoring event.

7.1.1.6 Wetlands

Although construction activities are not anticipated to have direct impacts on wetlands, Waste Connections will have a qualified person inspect the ESC measures at the site weekly during the construction phase and monthly during the landfill's operational phase.

7.1.1.7 Stormwater Management Ponds

Waste Connections will inspect the wildlife exclusionary fencing weekly during construction and quarterly under normal operations. Samples from the newly created stormwater ponds will be analyzed once-monthly during the non-iced period (generally between April 1 and November 15). Samples will be analyzed for a period of two (2) years post construction. Deficiencies observed will be reported to the appropriate person (e.g., Landfill manager, contractor, designate) and repaired as soon as reasonably possible. Additional information on surface water monitoring is included in **Section 7.1.3**.

7.1.2 Groundwater

The objectives of the groundwater monitoring program are:

- To be consistent with the existing groundwater monitoring program in place for the existing landfill;

- To identify potential changes in background groundwater quality in each of the principal hydrostratigraphic units;
- To identify impact on groundwater quality potentially attributable to the operation of the landfill;
- To identify changes in the pattern of groundwater movement at the site; and
- To be used as part of the triggering mechanism for contingency measures.

Groundwater monitoring will be carried out as per Appendix D6 – Design and Operations Report and Appendix D7 – Hydrogeological Impact Assessment which contains details on sampling frequency, water level monitoring, monitoring station maintenance and reporting practices. The following sub-sections summarize the programs.

7.1.2.1 On-Site Groundwater Monitoring

There are 48 monitoring wells that constitute the current groundwater monitoring program on-site. Of the 48 monitoring wells, six (6) new wells were installed along the south boundary of the expansion area as part of this EA. These six (6) additional well nests will be added to the monitoring program following ECA approval of the proposed expansion. The location of the groundwater monitoring wells are shown in **FIGURE 7-1**.

Table 7-1 summarizes the groundwater monitoring program for the Old Landfill area, **Table 7-2** summarizes the groundwater monitoring program for the West Landfill/Area A and South Landfill/Area B. It is noted that the Landfill Standards[201] recommends that samples be taken three (3) times per year (once for analysis of the comprehensive list and twice for analysis of the indicator list. However, given the extremely slow groundwater velocities through Layer 2 at the site and the extensive historical water quality data base, retaining the current sampling frequencies as listed in **Table 7-1** and **Table 7-2** is appropriate. Refer to **Table 7-3** for a list of target parameters. Refer to **FIGURE 3-9** for an illustration of the hydrogeology layers.

[201] Ministry of the Environment, Conservation and Parks (2012). Landfill Standards – A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfill Sites. Available at: https://www.ontario.ca/page/landfillstandards-guideline-regulatory-and-approval-requirements-newexpanding-land. Last updated on March 22, 2019.

Table 7-1: Groundwater Monitoring Program - Old Landfill

Hydrostratigraphic Layer	Sampling Locations	Frequency
Layer 1 Shallow Weathered Till	11-I, 16-I, 18-I, 19-I, 20-I, 21-I, 22-I, 25-I, 30-III, 32-III, 44-III 1-II, 3-III, 12-I, 5-II, 13-I, 15-I, 31-I	Twice per year (May and September)
Layer 2 Unweathered Till	3-II, 14-I, 30-II, 32-II, 44-II	Twice per year (May and September)
Layer 3 Basal/Bedrock Aquifer	BW-1, BW-4, 32-I, 30-I	Twice per year (May and September)

Table 7-2: Summary of Groundwater Monitoring Program – West Landfill/Area A and South Landfill/Area B

Hydrostratigraphic Layer	Sampling Locations	Frequency
Layer 1 Shallow Weathered Till	Existing Wells 28-III, 46-III, 47-I, 48-I, 49-A, 50-A, 58-A, 59-A, 60-A, 61-A New Wells (installed in 2012) 62-A, 63-A, 64-A Expansion Wells (installed in 2016) 71-A, 72-A, 73-A, 74-A, 75-A and 76-A	Twice per year (May and September)
Layer 2 Unweathered Till	Existing Wells 28-II, 46-II, 47-II, 49-B, 50-B Proposed Wells (installed as filling proceeds) 61-B, 64-B Expansion Wells (installed in 2016) 71-B, 72-B, 73-B, 74-B, 75-B and 76-B	Twice per year (May and September)
Layer 3 Basal/Bedrock Aquifer	Existing Wells 28-I, 46-I, 49-C, 50-C Proposed Wells (installed as filling proceeds) 61-C, 64-C Expansion Wells (installed in 2016) 71-C, 72-C, 73-C, 74-C, 75-C and 76-C	Twice per year (May and September)

Table 7-3: Target Parameter List

Comprehensive List (May Samples)	Indicator List (September Samples)
Inorganics Alkalinity, Ammonia, Arsenic, Barium, Boron, Cadmium, Calcium, Chloride, Chromium, Electrical Conductivity, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nitrate, Nitrite, Total Kjeldahl Nitrogen, pH, Total Phosphorus, Potassium, Sodium, Total Dissolved Solids, Sulphate, Zinc.	**Inorganics** Alkalinity, Ammonia, Barium, Boron, Calcium, Chloride, Electrical Conductivity, Iron, Magnesium, Nitrate, pH, Sodium, Total Suspended Solids, Sulphate.
Volatile Organics	**Volatile Organics**
Benzene, 1,4 Dichlorobenzene, Dichloromethane, Toluene, Vinyl Chloride	Not applicable
Other Organics	**Other Organics**
Chemical Oxygen Demand, Dissolved Organic Carbon, Phenol.	Chemical Oxygen Demand, Dissolved Organic Carbon.
Field Measurements pH, Electrical Conductivity	**Field Measurements** pH, Electrical Conductivity

Water levels will continue to be recorded twice per year, in May and September, prior to purging the groundwater monitoring wells. The data will continue to be used to establish long-term trends in groundwater levels and to provide base data for assessment of fluctuation in water quality data.

Overall, groundwater quality will continue to be evaluated by comparison with the following:

- Ontario Drinking Water Standards (ODWS);
- Background groundwater quality;
- Leachate quality; and
- MECP Guideline B-7: The Incorporation of the Reasonable Use Concept into Groundwater Management.

All wells regardless if they are included in the monitoring program will be regularly assessed and repaired, replaced or decommissioned as required, in accordance with accepted standard practices. All groundwater monitoring wells will be properly capped, locked and protected from damage. In areas where landfilling is to proceed around monitoring wells, suitable extensions will be added to the wells and they will also be re-secured. If a monitoring well is required to be decommissioned, it will be decommissioned in accordance with accepted standard practice that will prevent contamination through the abandoned well and in accordance with *O.Reg. 903*. A report on the decommissioning will be made in the annual monitoring report for the period during which the well was decommissioned.

The groundwater monitoring program will be continued until two (2) years after site closure, after which time the frequency and location of sampling and the list of analyses will be reviewed. The review, in discussions with the MECP, will include an analysis of all data collected to that time and an assessment of specific future objectives of the monitoring program.

7.1.2.2 Private Groundwater Well Monitoring

There are currently 15 private groundwater monitoring wells off-site that are sampled annually in September of each year. **FIGURE 3-11** shows the location of the private wells. Samples are collected at a point in the plumbing system prior to any in-line treatment systems or water softeners, if practical.

Waste Connections will continue to provide private groundwater well monitoring to nearby residents, as requested.

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WASTE CONNECTIONS OF CANADA

RIDGE LANDFILL
ENVIRONMENTAL ASSESSMENT

FIGURE 7-1
ON-SITE GROUNDWATER MONITORING WELL LOCATIONS

- Active Monitoring Well
- 2016 Monitoring Well Nest
- On Site Study Area and Property Boundary

1:12,000

0 120 240 480 m

N W E S

MAP DRAWING INFORMATION:
DATA OBTAINED FROM MNRF

MAP CREATED BY: GM
MAP CHECKED BY: MB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 152456

DATE: 2019-10-18

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7.1.3 Surface Water

The overall objectives of the surface water monitoring program are as follows:

- To monitor off-site surface water quality (upstream and downstream of the site) and compare to the Provincial Water Quality Objectives (PWQO)[202];
- To monitor the water discharged from the stormwater ponds to ensure that the quality of outflows to the receiving watercourses satisfies the requirements of the ECA; and
- To proactively identify surface water quality impacts and implement contingency measures, if necessary.

The following are the surface water monitoring activities that will be implemented for the preferred alternative. The surface water monitoring program is also detailed in Appendix D6 – Design and Operations Report and Appendix D10 – Surface Water Impact Assessment.

A surface water quality monitoring program has been ongoing at the Ridge Landfill site since 1986. Surface water quality monitoring will be conducted in the stormwater ponds (locations denoted by SWP) and municipal drains (locations denoted by SW) to ensure that acceptable levels of discharge water quality are maintained. As recommended in the Landfill Standards[203], surface water samples will be taken four (4) times per year as per the current program. The surface water monitoring locations in the municipal drains for the ongoing quarterly monitoring program are listed below in **Table 7-4**. The proposed sampling frequency is March, May, September, and December, which is consistent with the current program. Each existing and future stormwater pond will be sampled.

In addition, samples may be collected more frequently at the stormwater ponds prior to discharging to the receiving drains.

[202] Ministry of the Environment, Conservation and Parks (1994c). Water Management Policies, Guidelines, Provincial Water Quality Objectives. PIBS 3303E. Available at: https://www.ontario.ca/page/water-management-policiesguidelines-provincial-water-quality-objectives. Last Updated: March, 2019.
[203] Ministry of the Environment, Conservation and Parks (2012). Landfill Standards – A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfill Sites. Available at: https://www.ontario.ca/page/landfillstandards-guideline-regulatory-and-approval-requirements-newexpanding-land. Last updated on March 22, 2019.

Table 7-4: Surface Water Sampling

Sampling Location ID	Watercourse	Location
SW4	Duke Drain	Allison Line and Concession Road 4 (upstream of landfill)
SW7	Howard Drain	Downstream of Site boundary (downstream of landfill)
SW11	Howard Drain	Downstream of Allison Line culvert (upstream of landfill)
SW12	Scott Drain	Upstream of outlet to Howard Drain (upstream of landfill)

Table 7-5 summarizes the list of parameters as per Schedule 5 of *O.Reg. 232/98*[204]. The quarterly surface water quality monitoring locations and parameters tested will continue as per the current program. Sampling will be conducted at all stormwater ponds to confirm that water quality is acceptable prior to discharge to the municipal drains. Surface water monitoring results will continue to be compared with the Provincial Water Quality Objectives (PWQO).

Table 7-5: Surface Water Monitoring Target Parameter List

Comprehensive List (May and September Samples)	Indicator List (March and December Samples)
Inorganics	**Inorganics**
Alkalinity, Ammonia, Arsenic, Barium, Boron, Cadmium, Calcium, Chloride, Chromium, Electrical Conductivity, Copper, Iron, Lead, Mercury, Nitrate, Nitrite, Total Kjeldahl Nitrogen, pH, Total Phosphorus, Potassium, Sodium, Suspended Solids, Total Dissolved Solids, Sulphate, Zinc.	Alkalinity, Ammonia, Chloride, Electrical Conductivity, Iron, Nitrate, Nitrite, Total Kjeldahl Nitrogen, pH, Total Phosphorus, Suspended Solids, Total Dissolved Solids, Sulphate.
Other Organics	**Other Organics**
Biochemical Oxygen Demand (BOD_5), Chemical Oxygen Demand, Phenol.	Biochemical Oxygen Demand (BOD_5), Chemical Oxygen Demand, Phenol
Field Measurements	**Field Measurements**
Temperature, pH, Electrical Conductivity, Dissolved Oxygen, Flow	Temperature, pH, Electrical Conductivity, Dissolved Oxygen, Flow

[204] Ministry of the Environment, Conservation and Parks (1998a). *Landfilling Sites: Ontario Regulation (O.Reg.) 232/98*. Last Updated: June 2011.

Observations of flow conditions will be made at the time of sampling at all locations. Records of the pond levels and discharge conditions will also be documented and maintained. Following closure the monitoring program requirements (i.e., parameters, frequency, and methodology) will be determined based on the results of sampling results during the operational phase of the landfill.

Waste Connections will develop and implement a benthic community monitoring program as part of the Howard Drain relocation approval process. The monitoring program will be based upon the Ontario Benthos Biomonitoring Network (OBBN) Protocol Manual. Details (i.e., sampling locations, frequency, and duration) will be determined during the permit and approvals process for the Howard Drain relocation

7.1.4 Air and Odour

As the site is in compliance with air quality regulations and relevant criteria, no monitoring is proposed at this time. However, to ensure that the site remains in compliance Waste Connections will continue to:

- Minimizing the size of the working face;
- Apply daily and intermediate cover material;
- Continue with the expansion of the landfill gas collection and management system to address the gas generated from the additional waste;
- Expand the landfill gas flaring system to efficiently destroy GHG;
- Employ dust suppression and control measures;
- Install and operate odour neutralizing systems; and
- Regularly communicate with neighbours.

Odour monitoring activities and best management practices are currently being developed for the landfill expansion as part of the ECA process and in consultation with the MECP.

7.1.5 Leachate Collection System

The objective of the leachate collection system monitoring is to assess performance and compliance of the system to determine whether the groundwater and surface water are impacted by the landfill.

Leachate levels will be measured in the leachate collection system manholes and compared with the adjacent ground elevation. Groundwater levels in the shallow, surficial clay are close to ground elevation and the manholes are a few metres below ground surface. Leachate levels that are measured to be below ground elevation in the manholes will indicate that the leachate collection system is creating a hydraulic trap and performing as designed.

Quality monitoring of the leachate collection system is conducted by collection of samples from the leachate storage tank on-site. The parameter list is summarized in **Table 7-6**, which is consistent with Schedule 5 of *O.Reg. 232/98*[205]. The collection frequency is consistent with the Landfill Standards[206].

Table 7-6: Leachate Collection System Monitoring Program

Comprehensive List (Once Per Year)	Indicator List (Two Other Occasions Per Year)
Inorganics	**Inorganics**
Alkalinity, Ammonia, Arsenic, Barium, Boron, Cadmium, Calcium, Chloride, Chromium, Conductivity, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nitrate, Nitrite, Total Kjeldahl Nitrogen, pH, Total Phosphorus, Potassium, Sodium, Suspended Solids, Total Dissolved Solids, Sulphate, Zinc	Alkalinity, Ammonia, Barium, Boron, Calcium, Chloride, Conductivity, Iron, Magnesium, Nitrate, pH, Sodium, Suspended Solids, Total Dissolved Solids, Sulphate
Volatile Organics	
Benzene, 1,4 Dichlorobenzene, Dichloromethane, Toluene, Vinyl Chloride	
Other Organics	**Other Organics**
Biochemical Oxygen Demand (BOD_5), Chemical, Oxygen Demand, Dissolved Organic Carbon, Phenol	Biochemical Oxygen Demand (BOD_5), Chemical Oxygen, Demand, Dissolved Organic Carbon
Field Parameters	**Field Parameters**
pH, Conductivity	pH, Conductivity

[205] Ministry of the Environment, Conservation and Parks (1998a). *Landfilling Sites: Ontario Regulation (O.Reg.) 232/98*. Last Updated: June 2011.
[206] Ministry of the Environment, Conservation and Parks (2012). Landfill Standards – A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfill Sites. Available at: https://www.ontario.ca/page/landfillstandards-guideline-regulatory-and-approval-requirements-newexpanding-land. Last updated on March 22, 2019.

7.1.6 Landfill Gas

The primary purpose of the LFG monitoring program is to monitor the performance of the LFG collection system (within the system and at the flare station) to ensure that it operates at optimal efficiency. This includes monitoring: vacuum, temperature, gas composition, and flow rate.

Sub-surface migration of LFG is highly unlikely given the installation of the cut-off wall or side slope liner and the physical site setting. However, as a safety precaution, combustible gas alarms are installed at all on-site buildings. On-site grass cover and planted vegetation are also inspected regularly to detect vegetation distress due to exposure to LFG.

Collected LFG is directed to on-site flares for destruction. In addition, surface monitoring of LFG would be conducted annually to identify "hot spots". Upon identification of hot spots or problem areas, remedial action would be taken, typically entailing improvements to the cover within the localized area of the hot spot or the installation of additional gas collection wells. This surface monitoring will be kept in place both during the operation of the landfill and post-closure. Proposed post-closure monitoring will be detailed in the post-closure plan to be submitted to the MECP for review and approval.

Waste Connections will re-evaluate the business case for the beneficial use of landfill gas four (4) years after the EA is approved and will report the results to the MECP.

7.2 Complaints

A complaint procedure will be maintained on-site and will include, as a minimum:

- Designation of a specific staff to receive any complaints. The designated staff will, within ten (10) working days, respond in writing to the complainant indicating the course of action taken and the outcome;
- Posting a telephone number for site complaints at the site entrance;
- Keeping an accurate record of the following information:
  - The name and address of the complainant;
  - The date and time of the complaint;
  - The nature of the complaint;
  - Wind speed and wind direction at the time of the complaint; and
  - Details of the response to the complainant, action taken and outcome.

- Reporting to each Ridge Landfill Liaison Committee meeting, a summary of all public complaints received, courses of action taken and outcomes not reported at previous meetings.

A summary of the complaints will also be included in the site's Annual Monitoring Report submitted to the MECP.

7.3 Annual Reports

To assist in the tracking of Site progress and performance, an Annual Site Development, Operations and Monitoring Report for the previous calendar year will be prepared and submitted to the MECP and the Ridge Landfill Liaison Committee.

The report will include the following information:

- The results and an interpretive analysis of the results of all groundwater, surface water, landfill gas, leachate collection system monitoring, and leachate monitoring, including the following:
  - The adequacy of the monitoring programs and recommendations for any modifications to programs as appropriate;
  - The extent to which the monitoring results indicate compliance with the conditions of the ECA, PWQO, ODWO, the Reasonable Use Guideline and any other relevant statutes and guidelines;
  - The trend of the monitoring results with respect to future compliance with the conditions of the ECA, PWQO, ODWO, the Reasonable Use Guideline and any other relevant statutes and guidelines; and
  - The current or expected future need to implement contingency plans and/or additional mitigation measures to ensure compliance with the Conditions of the ECA, PWQO, ODWO, the Reasonable Use Guideline and any other relevant statutes and guidelines;
- Summary of site inspections;
- Site plans showing:
  - Existing contours of the site;
  - Areas of landfilling operation during the reporting period and areas of intended operation during the next reporting period;

  - Areas of excavation during the reporting period;
  - The progress of final and interim cover application;
  - Previously existing site works, including stockpiling, works installed during the reporting period, and works planned for installation during the next reporting period and the progress of seeding on final and interim cover; and
  - Areas and quantities where dewatered sewage biosolids were used as daily, intermediate and final cover.

- A summary of the quantity of any leachate removed, or treated and discharged, from the site, during each operating week;
- The type and quantity (by weight) of all waste, alternative daily cover, interim cover and final cover disposed or applied during the reporting period;
- Calculation of the total volume of the site capacity used during the reporting period;
- A calculation of the remaining capacity of the site and an estimate of the remaining site life;
- A summary of the weekly, maximum daily and annual tonnage of waste received at the site;
- A summary of the public complaints received and the responses made including the actions taken to resolve these complaints;
- Other measures undertaken to reduce or prevent off-site impacts and to ensure compliance with the MECP's requirements;
- Extent and timing of the contingency measures related to surface water and groundwater that may be needed to be implemented;
- Report on the decommissioning of wells that have been decommissioned in the reporting year;
- A brief description of the changes to the operational procedures and the resultant changes to the impact management plans; and
- A discussion of the operation and performance of the major works at the site, any operational problems encountered at the site (dust, odour and noise) and the remedial measures taken to alleviate the impacts from those problems.

7.4 Ridge Landfill Liaison Committee

There is a Ridge Landfill Liaison Committee in which Waste Connections continues to participate. The Ridge Landfill Liaison Committee is a long-term committee that was established to provide feedback on the operation of the landfill.

The terms of reference, membership, and meeting protocols were established by the committee. The terms of reference for the committee may be altered with the approval of the Regional Director of the MECP.

All meetings of the Ridge Landfill Liaison Committee are open to the public and copies of all committee reports and minutes are made available to the public.

7.5 Environmental Management

The Ridge Landfill has been in operation since the 1960s. Waste Connections has an extensive and rigorous environmental management system in place that follows stringent MECP regulations. Operations at the landfill are continuously reviewed and updated to protect the environment and minimize potential effects such as litter, birds, dust, noise and odour. Policies and procedures are in place that govern the way in which the Ridge Landfill is operated. These will be updated upon EA approval.

Procedures established to ensure safe operation and management of the facility and compliance with the ECA will continue to include:

- Waste acceptance and approvals procedures;
- Locations of health and safety equipment and personal protective equipment requirements;
- Traffic controls;
- Tipping area rules and procedures;
- Management/control methods for litter, birds, noise, odour and dust;
- Complaint response protocol;
- Traffic control (off-site and on-site);
- Fire prevention and response;
- Management of surface water, leachate and LFG; and
- Inspection and maintenance program.

The policies and procedures will be updated as needed to include proposed mitigation measures, commitments and monitoring identified in the Impact Assessment reports and requirements from the approvals and permits for the proposed landfill expansion.

7.6 Contingency Measures

A contingency plan is required by *O.Reg. 232/98*[207] and is defined as "an organized set of procedures for identifying and reacting to an unexpected, but possible occurrence".

Contingency plans will be "triggered" when observed or predicted impacts are found to be unacceptable. Impacts will be determined through assessment of data collected from the monitoring programs. Contingencies will typically require the installation of additional facilities.

7.6.1 Groundwater

When considering the contingency plan for groundwater protection, it was recognized that the time for impacts due to the failure of the leachate control system to be detected at monitoring wells in the basal/bedrock aquifer unit (Layer 3) will be very long, given the very slow downward movement through Layer 2. This highlights the importance of monitoring the performance of the leachate control system via regular inspections and water level monitoring in the leachate collection system. If failure of the leachate control system is detected and contingency measures are implemented, there may be no detectable impact resulting from the failure.

Results of the monitoring program can also be used to implement contingency measures. The contingency measures will be triggered by a verified degradation in water quality attributable to the operation of the landfill. Two (2) tiers of the groundwater contingency plan are proposed.

7.6.1.1 Tier 1 – Investigation

In the event of groundwater contamination at compliance wells in excess of a maximum of 85% of the allowable concentration as defined by the Reasonable Use Guideline, Tier 1 of the contingency plan will be implemented.

[207] Ministry of the Environment, Conservation and Parks (1998a). *Landfilling Sites: Ontario Regulation (O.Reg.) 232/98*. Last Updated: June 2011.

Tier 1 will consist of investigating, in detail, the reason for the exceedance and determining appropriate mitigation measures. In general, the Tier 1 investigation will proceed as follows:

- Resample the well(s) that exceeded 85% of the allowable concentration as defined by the Reasonable Use Guideline. The reason for the resampling is to determine if the exceedance was caused by sampling/laboratory error. Three (3) samples will typically be collected for analysis, one (1) month apart. If all three (3) samples are below 85% of the allowable concentration, the exceedance can be attributed to sampling/laboratory error and no further action is necessary;
- Complete an operations review of activities and systems in the vicinity of the well with the exceedance;
- Install new monitoring wells in the vicinity of the well with the exceedance, especially between the well and the downgradient property boundary. This is designed to determine the extent of the problem; and
- Evaluate whether the identified exceedance will likely cause an exceedance of allowable concentrations at the downgradient property boundary. If an exceedance of allowable concentrations at the downgradient property boundary is determined to be likely, then Tier 2 of the contingency plan will be implemented.

7.6.1.2 Tier 2 – Design, Approval and Implementation

Tier 2 of the contingency plan will be to design and implement measures that will prevent off-site migration of groundwater with concentration of parameters greater than allowable concentrations. A detailed design of the proposed measures will be submitted to the MECP for approval prior to implementation. Tier 2 of the contingency plan will consider the two (2) potential pathways for contaminants to migrate from the landfill in groundwater:

- Pathway 1 - horizontal movement of contaminated groundwater through the shallow weathered till soils (Layer 1). The preferred contingency plan to mitigate contamination in the weathered till soils (Layer 1) is the installation of a perimeter cut-off wall similar to that used at the existing Old Landfill waste fill area. If necessary, this contingency can be coupled with a shallow groundwater collection system on the landfill side of the cut-off wall that will collect contaminated groundwater and induce groundwater movement in the shallow weathered soils towards the site.
- Pathway 2 - vertical movement of contaminated groundwater through the dense unweathered, low permeability till soils (Layer 2) to the basal/bedrock aquifer (Layer 3). The mitigation measures to be implemented will likely involve active hydraulic controls (e.g., groundwater purge wells) to prevent contaminated

groundwater from moving off-site in unacceptable concentrations. It should be noted that due to the length of time for contaminants to move through the unweathered till soils, premature failure of the leachate collection system would result in a peak impact on the bedrock aquifer in about 3,000 years and the groundwater would still meet drinking water objectives.

7.6.2 Surface Water

The water quality in the stormwater ponds is monitored regularly to confirm that it meets surface water quality objectives. Water quality monitoring coupled with routine site inspections, maintenance and/or changes in operational practices will be applied to minimize surface water impacts.

During the construction and operational phases of the landfill, the stormwater ponds will continue to be operated in batch mode. Before release of water from a stormwater pond, samples will be collected and tested for leachate impact. Test results will be compared against the discharge objectives. Therefore, there should be no discharge to off-site watercourses until water quality has been confirmed.

If there is evidence of leachate contamination in any of the stormwater ponds, the impacted water will be managed as leachate. In this case, the impacted water may be directed to the leachate collection system. Alternative measures may include recirculation of contaminated surface water back into the landfill.

Uncontrolled leachate breakouts or accidental spills detected by site inspections may trigger the contingency plans. In such a case, early detection can minimize or effectively eliminate impacts to surface water, especially if containment of the contamination and repair of the landfill cover is undertaken promptly.

The potential for impacts on surface water as a result of the discharge of contaminated groundwater to the surface is low. The groundwater monitoring program identifies potential groundwater contamination before it can be discharged to surface waters. In the event that groundwater contamination is identified, contingency measures as described in **Section 7.6.1** will be implemented as appropriate, resulting in the protection of both groundwater and surface water resources.

Any changes to the specific trigger levels for the surface water monitoring program will be approved by the MECP prior to the implementation of any changes.

7.6.3 Archaeology and Heritage Resources

Alteration of the site may not occur, other than by a licensed archaeologist and until their recommendations have been reviewed by the Ministry of Heritage, Sport, Tourism and Culture Industries (formerly known as Ministry of Culture, Tourism and Sport) and filed in the Ontario Public Register of Archaeological Reports. Should archeological resources be discovered, work will be stopped and the Ministry of Heritage, Sport, Tourism and Culture Industries and Indigenous Communities and Organizations will be notified.

If significant architectural elements are uncovered during demolition of heritage features, work will stop and contact made with applicable government agencies.

7.6.4 Transportation

If the haul route is closed temporary due to an emergency, the existing network of municipal roads, that are designed to accommodate truck traffic, will be used. Discussions with the Municipality of Chatham-Kent in particular and MTO, if necessary, will confirm an appropriate temporary haul route.

7.6.5 Leachate Management

Various options exist if the BWTL cannot treat the leachate such as: temporary storage of leachate within the collection system and/or controlled leachate recirculation into the landfill, temporarily trucking to the Chatham Wastewater Treatment Plant or another approved facility is also an option.

7.6.6 Landfill Gas Management

In the event that LFG odours become a problem, the LFG collection system can be expanded by installing additional horizontal collectors or vertical extraction wells. The LFG collection system construction schedule can be revisited and compressed to respond to odour issues. The potential for sub-surface migration of landfill gas to impact on-site buildings and foundations is negligible given the very dense and impermeable soils at the site. However, as a contingency measure, gas detectors have been and will continue to be installed in all buildings at the site.

7.6.7 Old Landfill Seep Remediation Trigger Criteria and Contingency Plan

As part of the initial review of the proposed expansion by the MECP, a request was made for Waste Connections to develop trigger criteria and a contingency plan in the event of failure of the finger drain system (leachate seeps). The following is an outline of the contingency plan that will be further developed as part of the ECA process. Any seep encountered

during daily inspections will be remediated as soon as practical. The following two-tier approach will be implemented to remediate seeps. The first Tier would be to install additional finger drains with connection to the existing finger drains, manholes or perimeter collection system. If leachate seeps reoccur within the same general area after the installation of additional finger drains, the Tier 2 contingency will be to install a continuous drainage layer underneath the final cover on the side slope at the location of the seeps with a perforated pipe installed at the toe of the drainage layer. The perforated pipe will be sloped to discharge to the nearest manhole. The Tier 1 and 2 approach will be localized and implemented as needed. Leachate subsurface migration beyond the perimeter collection system is covered under **Section 7.6.1**.

7.7 Commitments

Section 4.3.5 of the MECP's *Code of Practice for Preparing and Reviewing EAs in Ontario*[208] requires that an EA include a monitoring framework to be carried out if the landfill expansion is approved by the Minister. The framework should consider all phases of the proposed expansion (e.g., planning, construction, operation, and post-closure) and include compliance monitoring and where appropriate, effects monitoring, as per Section 4.3.5:

"Compliance monitoring is an assessment of whether an undertaking has been constructed, implemented and/or operated in accordance with the commitments made in the EA and the conditions in the EAA approval."

An EAA Compliance Monitoring Program will be prepared for MECP review and approval and an EAA Compliance Monitoring Report will be prepared and submitted annually to the MECP. **Table** 7-7 is a summary of the commitments made in this EA that will be included in the EAA Compliance Monitoring Program and reported on in the annual reports. The table includes the following information:

- Category – technical discipline or topic area (e.g., biology, noise);
- EA Reference – where, in the EA, the commitment is made;
- EA Commitment - specific commitment made in the EA; and
- Timing – When the commitment will be implemented (e.g., construction, operation, closure).

[208] Ministry of the Environment, Conservation and Parks (2014a). Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario, January 2014.

Commitments made during the development of the ToR and EA work plans (planning stages) are documented in Appendix C. Any commitments related to the construction, operation, closure and post-closure of the landfill have been carried forward in **Table 7-7**.

Table 7-7: Commitments

Category	EA Reference	Commitment	Timing
Natural Environment – Biological *Vegetation*	6.1.2	A timing constraint of April 15 to August 15 will be applied for vegetation removal activities to avoid nesting birds in keeping with the *Migratory Birds Convention Act*, 1994. This timing window will also serve to avoid roosting bats.	April 15 to August 15 during construction
	6.1.2	Best management practices will continue to be in place to mitigate the potential for indirect impacts (e.g., staging of equipment and stockpiling away from wooded areas or wetlands).	During construction
	6.1.2	The west, south and east berms will be naturalized with native species potentially providing additional meadow and/or pollinator habitat.	During construction
	6.1.2	Although the southwest woodlot does not provide SAR bat habitat, the removal will take place during non-active bat period (i.e., Oct. 1 to March 31 inclusive) which coincides with the restricted bird breeding period.	Oct. 1 to March 31 during construction
	6.1.2	Planting of 11,000 trees representing a replacement of the woodlot at a 2:1 ratio. 3,000 trees to be planted at a location identified by Chippewas of the Thames First Nation, 1,000 trees in association with the Oneida Nation of the Thames and 7,000 to be planted across Erieau Road from the landfill adjacent to an existing woodlot.	Prior to construction
	6.1.2	Given the potential for construction works adjacent to the southeast woodlot (confirmed SAR bat habitat), a construction limit buffer will be demarcated to avoid encroachment within the woodlot.	Prior to construction and during construction
	7.1.1	Implement a tending program (including contingency measures) for a minimum of three (3) years to observe the success of the restoration and naturalization efforts.	To start immediately upon planting and continue for 3 years
	7.1.1	Consult with Indigenous Communities and Organizations to determine whether the community members wish to take part in the tending program.	Prior to planting

Category	EA Reference	Commitment	Timing
Wildlife	6.1.2, 8.7.3 and 8.7.5	Indigenous Communities and Organizations will be consulted during the seed and tree identification process and engaged in woodlot replacement and on-site berms.	Prior to and during construction
	8.8.1 and 8.8.6	Continue to engage the MECP and the Municipality of Chatham-Kent to ensure that potential effects to woodlots and/or other natural features are mitigated, as appropriate.	Ongoing
	7.1.1	Have a qualified person experienced in bird identification on-site during vegetation clearing activities.	Prior to construction
	7.1.1	Have a qualified person trained in wildlife identification and wildlife BMP on-site full-time during construction activities in the event wildlife is encountered.	During construction
	7.1.1	Inspect the wildlife exclusionary fencing weekly during construction and quarterly under normal operations.	Weekly during construction / Quarterly during operation
Species-at-Risk	6.1.2	On-site personnel will receive SAR training prior to the commencement of construction activities and a Contractor Information Manual will be prepared documenting the various SAR with the potential to be encountered during construction activities.	Prior to construction
	6.1.2	Any species listed as endangered, threatened or on the Species at Risk in Ontario (SARO) List that are encountered at the project location will be protected from all harm and harassment.	During construction and operation
	6.1.2	Any SAR individual (presumed to be unharmed) that is incidentally encountered in the project location will be allowed to leave of its own accord. Activities within 30 m will cease until the individual disperses.	During construction and operation

Category	EA Reference	Commitment	Timing
	6.1.2	If an injured or deceased SAR is found, the specimen will be placed in a non-airtight container that is maintained at an appropriate temperature and a Wildlife Custodian (authorized under the Fish and Wildlife Conservation Act) will be contacted. MECP will be contacted immediately after the occurrence.	During construction and operation
	6.1.2	Any SAR individual that is present at the project site will be reported to MECP staff within 48 hours of the observation or the next working day, whichever comes first.	During construction and operation
	6.1.2	A permit (if required) will be submitted for temporary removal of eastern meadowlark habitat and monitoring of replacement habitat as required.	Project will be registered under *O.Reg. 242/08*, under s23.6 per the LOA provided by MECP
	6.1.2	Section 23.6 (bobolink, eastern meadowlark) of *O.Reg. 242/08* will be followed, including online registration of the project, development of a habitat management plan and creation of new habitat. Project will be registered under *O.Reg. 242/08*, under s23.6 per the LOA provided by MECP.	Prior to construction
	6.1.2	The agricultural building will be assessed for the presence of barn swallows before removal. If barn swallows are present, the barn removal will not occur during nesting season. Any nests present at the time of removal will be replaced at a 1:1 ratio.	Prior to construction
	6.1.2	If removal of barn swallow nests is required, the activities will be registered under s23.5 (barn swallow) so long as the conditions in the regulation are followed.	May 1 and August 1 the year prior to their proposed removal

Category	EA Reference	Commitment	Timing
	6.1.2	Construction activities will avoid the creation of vertical faces and stockpiles or excavated areas. The Best Management Practices for the Protection, Creation and Maintenance of Barn Swallow Habitat in Ontario[209] will be followed throughout the project.	During construction
	6.1.2	All on-site personnel will be made aware of the potential presence of eastern foxsnake in the area, its habitat and the protection afforded under the *ESA 2007* prior to conducting work on the site.	Prior to construction
	6.1.2	During active season for snake species, individuals may find and occupy materials and equipment stored on-site; therefore, a clean, debris-free work site will be maintained (e.g., storage of flat materials like plywood and rubber mats in open areas should be avoided).	During construction and operation
	7.1.1	Prior to the removal of potential barn swallow habitat, have a qualified person capable of identifying barn swallow nests assess the structures for presence of barn swallow nest(s).	May 1 and August 1 the year prior to their proposed removal
	7.1.1	Have a qualified person inspect the operational buffer demarcations associated with confirmed SAR habitat bi-annually during the operational phase.	Bi-annually during operation
Erosion and Sediment Control	6.1.2	Sediment and erosion control measures (i.e., silt fencing) will be put in place prior to construction to avoid impacts (e.g., sediment loading, garbage, etc.) on adjacent natural features, minimize potential for encroachment into natural areas, and prevent wildlife from entering construction areas. A wildlife sweep will be completed after fencing is put in place and before vegetation removal.	Prior to construction
	6.1.2	The use of mesh or netting type stabilization material must not be used for erosion control measures.	During construction

[209] Ministry of Natural Resources and Forestry (2017). Best Management Practices for the Protection, Creation and Maintenance of Barn Swallow Habitat in Ontario. Queen's Printer for Ontario, 2017. 37 pp.

Category	EA Reference	Commitment	Timing
Aquatic Species and Habitat	6.1.2	Best management practices will be in place including erosion and sediment control, keeping equipment clean, preventing materials from entering watercourses, etc.	During construction
	7.1.1	Have a qualified person inspect the ESC measures weekly during the construction phase and monthly during the landfill's operational phase.	Weekly during construction / monthly during operation
	6.1.2	The relocated drain will be designed with enhanced fish habitat features over its longer length (approximately 1,600 m).	During design
	6.1.2	In-water work will be scheduled to occur between July 1 and March 14 of any given year.	July 1 and March 14 during construction
	6.1.2	Prior to relocation of the drain the construction area will be isolated from flow (while maintaining flow to downstream) and fish salvage will be performed.	During construction
	6.1.2	Best management practices will continue to be in place to mitigate the potential for temporary disturbance (e.g., staging of equipment should take place away from watercourses).	During construction
	6.1.2	Prior to dewatering/removal of stormwater pond 3, a Fish and Wildlife Salvage Plan will be implemented to avoid mortality of fish, amphibians and/or reptiles.	During construction
	7.1.1	Collect samples from the newly created stormwater ponds once-monthly during the non-iced period (generally between April 1 and November 15).	Monthly during the non-iced period for two (2) years
Natural Environment – *Hydrogeological*	6.2.2	Engineering controls such as a clay liner and leachate collection system will be designed to manage leachate over the long term.	During design
	6.2.2	The groundwater monitoring plan will be updated for the expanded site.	During design
	6.2.2	Design of the expansion will include a leachate collection system.	During design

Category	EA Reference	Commitment	Timing
	7.1.2	Six (6) new monitoring wells (already installed) will be added to the monitoring program following ECA approval of the proposed expansion.	Post ECA approval
	7.1.2	The groundwater monitoring program will be carried out twice per year (May and September).	Ongoing, twice per year during construction, operation and 2 years post closure
	7.1.2	Water levels in all monitoring wells will be recorded twice per year (May and September).	Ongoing, twice per year during construction, operation and 2 years post closure
	7.1.2	All groundwater monitoring wells will be regularly assessed and repaired, replaced or decommissioned as required, in accordance with accepted standard practices.	Ongoing during construction, operation and 2 years post closure
	7.3	The monitoring program will be documented in an annual monitoring report.	Annually during construction, operation and 2 years post closure
	7.1.2	The frequency and location of sampling and the list of analyses of the groundwater monitoring program will be reviewed in consultation with the MECP two (2) years after site closure.	Two (2) years post closure
	6.2.2 and 7.1.2	The fifteen (15) private groundwater monitoring wells off-site will be sampled annually in September (Number may vary as it is a voluntary program).	Annually during construction and operation
	7.6.1	Contingency plans to protect groundwater in the event of an unforeseen incident were developed during the EA.	During design
	6.3.2	Install and maintain erosion and sediment control measures during construction.	During construction

Category	EA Reference	Commitment	Timing
	6.3.2	Capturing surface water in stormwater ponds and testing prior to release to municipal drains.	Post construction
	6.3.2	Continued implementation of best practices for dust control, spill response and maintenance.	During Construction and Operation
	7.1.3	The quarterly surface water quality monitoring locations and parameters tested will continue as per the current program.	Quarterly during construction and operation
	7.1.3	Samples may be collected more frequently at the stormwater ponds prior to discharging to the receiving drains.	As needed during construction and operation
Natural Environment – *Surface Water*	7.1.3	Observations of flow conditions will be made at the time of sampling at all locations.	Quarterly during construction and operation
	7.1.3	Records of the pond levels and discharge conditions will be documented and maintained.	Ongoing during construction and operation
	7.1.3	Surface water monitoring results will continue to be compared with the Provincial Water Quality Objectives (PWQO).	Quarterly during construction and operation
	7.1.3	A benthic community monitoring program will be developed and implemented as part of the Howard Drain relocation approval process.	During Howard Drain approval process
	7.1.3	Following closure, the monitoring program requirements (i.e., parameters, frequency, and methodology) will be determined based on the results of sampling results during the operational phase of the landfill.	Post closure

Category	EA Reference	Commitment	Timing
Natural Environment – *Atmospheric*	6.4.2	Mitigative measures typical of normal landfill operations and consistent with industry best practices such as road cleaning, daily cover, expansion of the landfill gas collection system, and continuation of flaring will be carried out.	Ongoing during construction and operation
	7.1.4	Monitoring and management measures for odour monitoring will be further defined as part of the ECA approval process and in consultation with the MECP.	ECA phase
Natural Environment – *Climate Change*	6.5.2	Operational best practices related to dust control, LFG and leachate management will mitigate any impacts associated with air emissions, dust and odour.	During construction and operation
	6.5.2	Expansion of the landfill gas collection system and continuation of flaring.	During construction and operation
	6.5.2	Removal of the southwest woodlot will be mitigated by a 2:1 ratio planting.	Prior to construction
	6.6.2 and 6.8.2	Waste Connections will terminate the leases consistent with the terms of the lease. Appropriate notice will be given.	To be determined
	6.6.2	All landfill activities will be confined on-site.	During construction, operation and post closure
Socio-Economic Environment - *Social*	6.6.2	Waste Connections will continue regular communications with neighbours as site evolves and encourage residents and businesses to contact Waste Connections with specific concerns.	During construction and operation
	6.6.2	Waste Connections is committed to maintaining compensation for affected residential parties if the landfill expansion is approved and proceeds. Waste Connections will notify those residents who will continue to receive compensation as well as residents who will be newly compensated of their compensation level as the process continues.	During operation
	6.6.3	Hosting agreements will be developed as appropriate.	During operation

Category	EA Reference	Commitment	Timing
Odour	6.6.2	Expansion of landfill gas collection system to the landfill expansion areas and continued flaring.	During construction and operation
	6.6.2	Continued implementation of site operating procedures (i.e., litter control, dust and odour controls).	Ongoing
	6.6.2	Use of odour control when needed (e.g., misting systems).	During construction and operation as needed
	6.6.2	Application of cover material at the end of each operating day.	During operation
	6.6.2	Place waste with strong odours at the toe of the working face and immediately cover with other garbage or daily cover.	During operation
Dust	6.6.2	Use of dust control measures (e.g., cleaning truck wheels, clean/water site roads when necessary).	During construction and operation
Litter	6.6.2	The working face will be kept to a minimum and additional equipment will be used to compact waste if necessary during higher winds. To the extent possible the working face will be shielded during higher winds.	During construction and operation
	6.6.2	Permanent litter fences will be installed and temporary litter fences used when needed. The fences will be appropriately maintained.	During construction and operation
	6.6.2	Carry out daily inspections and litter pickup as required.	During construction and operation
	6.6.2	Monitor wind conditions and pick up litter from surrounding fields after high wind events.	During construction and operation
Noise	6.6.2	The berms and associated landscaping/naturalization will be designed and constructed so as to reduce noise.	During construction and operation
	6.6.2	On-site machinery will be operated to reduce noise where possible (e.g., noise abatement equipment on machinery will be properly maintained, the use of	During construction and operation

Category	EA Reference	Commitment	Timing
		reverse gear will be minimized, impulsive noise (e.g., horns) will be minimized to the extent possible).	
Visual	6.6.2	Construct berms and naturalization with native species including shade trees, evergreen trees, shrubs, etc. which will reduce visibility	During construction
	6.6.2	Areas of the landfill areas that are not actively being filled will be restored to a seeded condition.	Operation and post closure
Socio-Economic Environment - *Economic*	6.7.2	Potential effects to property values are currently mitigated by the Property Value Protection Program which will be continue with the proposed expansion.	During operation
	6.8.2	Continued dialogue between Waste Connections, the public and third-party haulers who use the landfill.	Ongoing
	6.8.2	Continuation of farming on-site for as long as possible until land is needed for landfill development activities.	To be determined
	6.8.2	Continued implementation of site operating procedures (i.e., litter control action plan, dust and odour controls).	Ongoing
Cultural Environment – *Cultural Heritage*	6.9.2	Completion of the Heritage Impact Assessment.	Completed
	6.9.2	Documentation and salvage of heritage features to be completed by a Cultural Heritage Specialist.	Prior to construction
Cultural Environment – *Archaeological*	6.10.2	The final Stage 3 archaeological investigation will be completed prior to construction. Any artifacts found will be documented and removed.	Prior to construction
	6.10.2	Construction will not begin until the site receives archaeological clearance.	Prior to construction
	6.10.2	Indigenous Communities and Organizations who have expressed an interest will continue to be informed of archaeological activities and invited to participate and/or review the results.	During design and prior to construction

Category	EA Reference	Commitment	Timing
	7.6.3	Alteration of the site may not occur, other than by a licensed archaeologist until their recommendation have been reviewed by the Ministry of Heritage, Sport, Tourism and Culture Industries and filed in the Ontario Public Register of Archaeological Reports.	During construction
	7.6.3	Should archeology resources be discovered, work will be stopped and the Ministry of Heritage, Sport, Tourism and Culture Industries and Indigenous Communities and Organizations will be notified.	During construction
Built Environment – *Land Use*	6.11.2	Continue to work with Chatham-Kent planners to apply for an Official Plan and Zoning By-law amendment to change the land use designation and zoning for the expansion lands prior to construction.	Prior to construction
Built Environment – *Transportation*	6.11.2	Continued dialogue between Waste Connections, the public and third-party haulers who use the landfill.	During construction and operation
	8.8.6	Continue to educate new drivers on protocols for the use of the designated haul route.	During construction and operation
	8.8.6	Continue to contribute towards maintenance of the haul route.	During construction and operation
Built Environment – *Bird Hazards to Aviation Safety*	6.13.2	Planned improvements to the existing bird control program are anticipated to effectively manage and potentially reduce residual risk of potential bird hazards to aircraft safety.	Ongoing
	6.13.2	Continued coordination with Chatham-Kent Municipal Airport on on-site bird control operations and activities.	During construction and operation
	8.8.7	Reimburse or supply the Chatham-Kent Municipal Airport with pyrotechnics for wildlife control at the Airport.	During construction and operation
	8.8.7	Share wildlife information between the Ridge Landfill and the Chatham-Kent Municipal Airport.	During construction and operation

Category	EA Reference	Commitment	Timing
Built Environment - Design and Operation	6.14.2	Continue to review assumptions related to climate change and consider how any change in assumptions has the potential to impact the project and how adaptive measures can continue to be incorporated into the site design.	During operation
	6.14.2	Higher or longer litter control fences will be installed if stronger than anticipated winds are encountered.	As needed during operation
	6.14.2	Staff working outdoors will use applicable standard operating procedures in periods of extreme heat or cold.	During construction and operation
	6.14.2	Surface water diversion berms, as included in final cover design, will be constructed to reduce runoff velocity and minimize erosion.	During design
	6.14.2	Perimeter ditches, ponds and the Howard Drain relocation will be designed to include allowance for increased storm intensity associated with climate change.	During design
	6.14.2	Construct berms using mostly excavated soil from new cell construction.	During construction
	5.15	Submit a Closure Plan will to the Regional Director of the MECP for approval when the landfill site is two (2) years from its projected closure.	Two years prior to projected site closure
	6.14.2	Waste Connections will review the viability of the business case for the beneficial use of landfill gas collect at the Ridge Landfill in four (4) years.	Four (4) years from approval of EA
Leachate Collection System Monitoring	6.14.2	The leachate conveyed to the BWTL will continue to be monitored.	During operation and post closure
	7.1.5	Leachate levels will be measured in the leachate collection system manholes and compared with the adjacent ground elevation once per year for the comprehensive parameter list and on two (2) other occasions per year for the indicator parameter list.	During operation and post closure
	7.6.7	Develop trigger criteria and contingency plan to address leachate seeps detected on the side slopes of the Old Landfill.	ECA phase

Category	EA Reference	Commitment	Timing
	8.8.6	Conduct regular communication with Chatham-Kent PUC to monitor capacity of Blenheim Wastewater Treatment Lagoons.	During operation and post closure
Landfill Gas Monitoring	7.1.6	Continue to maintain combustible gas alarms which are installed at all on-site buildings	Ongoing, as needed
	7.1.6	Regularly inspect on-site grass cover and planted vegetation to detect vegetation distress due to exposure to LFG.	During operation and post closure
	7.1.6	Surface monitoring of landfill gas will continue during the operation of the landfill and post-closure periods.	During operation and post closure
	7.1.6	Proposed post-closure monitoring will be detailed in the post-closure plan to be submitted to the MECP for review and approval.	ECA phase
	7.1.6	Waste Connections will re-evaluate the business case for the beneficial use of landfill gas four (4) years after the EA is approved and report the results to the MECP.	4 years after EA approval
Complaints	7.2	Implement the complaint monitoring program in Section 7.2, which will include, as a minimum: • Designation of a specific staff to receive any complaints; • Posting a telephone number for site complaints at the site entrance; • Keeping an accurate record of information; and • Reporting to each Ridge Landfill Liaison Committee meeting.	During operation and post closure
	7.2	Include a summary of the complaints in the site's Annual Monitoring Report submitted to the MECP.	During operation and post closure
Consultation	8.8.6	Waste management education is a priority of Chatham-Kent. Waste Connections will partner with the Municipality to implement suitable educational programs.	During operation

Category	EA Reference	Commitment	Timing
	8.7.5	Continue to update WIFN, and other Indigenous Communities and Organizations on the timing of expansion events as the Undertaking progresses.	During operation
	8.7.1 and 8.7.5	Future Annual Monitoring Reports will be available. WIFN and AFN will be notified, as requested.	During operation
	6.11 and 8.8.6	Continue to work with Chatham-Kent on road related issues associated with the Haul Route.	During operation
	8.5.3	Continue to provide Operations Updates to neighbours within 1 km of the site.	During operation
	7.4	Waste Connections will continue to participate in the Ridge Landfill Liaison Committee.	During construction and operation
Diversion	9.0	Implement enhanced waste diversion programs for the IC&I sector as documented in this EA and partner with the Municipality of Chatham-Kent to align with Provincial objectives.	During operation
	9.0	Waste Connections is committed to supporting the *Resource Recovery and Circular Economy Act* and related policies.	During operation
	9.0	Waste Connections will continue to look for opportunities to provide new and innovative services that meet customer needs, address and support government policies and are economically viable.	During operation