Appendix C

Net Effects Analysis of the Leachate Management Options

Table C-1

Net Effects Analysis of Leachate Management Option A

Leachate Management Option A

Table C. 1 Leachate Management Option A Potential Environmental Effects, Mitigation Measures and Net Effects

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
Natural Environment					
Geology / Hydrogeology	Effect on groundwater quality	– Predicted effects to groundwater quality at property boundaries and off-site	– The existing hydrogeologic conditions at the site and surrounding areas are well understood (i.e., groundwater flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and previous quarries. – A third on-site leachate lagoon will be added adjacent to the current two lagoons. Like the current on-site lagoons, the additional leachate lagoon will be lined and will be hydraulically separated from the natural groundwater systems. – The current hydrogeologic conditions at the campus will remain unchanged, with groundwater in the various bedrock units drawn to the existing GWCS. The current flow regimes and inward hydraulic gradients toward the site within the key bedrock units (Lockport dolostone and Rochester shale) will be maintained. – As groundwater levels in the various bedrock units will remain unchanged, off-site residential groundwater supplies will not be negatively impacted.	– No mitigation measures are required	– No effect to groundwater flow at property boundaries and off-site **NO NET EFFECTS**
	Effect on groundwater flow	– Predicted effects to groundwater flow at property boundaries and off-site	– The existing hydrogeologic conditions at the site and surrounding areas are well understood (i.e., groundwater flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and previous quarries. The current hydrogeologic conditions at the campus will remain unchanged, with inward hydraulic gradients maintained toward the site within the key bedrock units (Lockport dolostone and Rochester shale). – A third on-site leachate lagoon will be added adjacent to the current two lagoons. Like the current on-site lagoons, the additional leachate lagoon will be lined and will be hydraulically separated from the natural groundwater systems. Development and implementation of an Environmental Monitoring Program (EMP) appropriate to the option will ensure that groundwater quality at the property boundaries is met. – Groundwater movement in the shallow bedrock underlying the landfill is influenced by the GWCS, and/or a future sub-drain system, maintaining the inward hydraulic gradients toward the site and providing predictable groundwater flow direction below the landfill. – Groundwater in the lower Irondequoit limestone bedrock is hydraulically separated from groundwater below the landfill by the Rochester shale, which acts as a regional aquitard. As such, groundwater in the Irondequoit limestone will not be affected. – As the groundwater hydraulic gradients are inward toward the site, off-site groundwater receptors will be upgradient of the site and will not be affected.	– No mitigation measures are required beyond the implementation of an EMP that is appropriate to the leachate management option.	– No effect to groundwater quality at property boundaries and off-site **NO NET EFFECTS**
Surface Water	Effect on surface water quality	– Predicted effects on surface water quality on-site and off-site	– The existing hydrologic conditions at the site and surrounding areas are well understood (i.e., surface water flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and previous quarries. – Potential for a failure of the additional force main, such as a breakage with discharge of leachate to the natural environment.	– A leachate sump, including a pump equipped with the needed metering equipment and controls is necessary for monitoring and contingency. – Opportunity for enhanced pre-treatment to lower cost of discharge to Region of	– The continued use of the existing municipal wastewater treatment system for the expanded South Landfill area will likely result in no to low net effects with respect to surface water resources. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
			– An existing force main leading off-site to the municipal wastewater treatment plant will need to be used to transport the leachate for treatment. Potential for a failure of the existing force main with the added discharge capacity, such as a breakage with discharge of leachate to the natural environment. – Throughout the lifecycle of the landfill, leachate strength will increase as the volume of waste in the landfill increases, which will gradually change the treatment requirements.	Niagara's Port Weller Wastewater Treatment Plant. – Review current sampling methodology to determine whether program is adequate for wastewater treatment plant discharge.	
	Effect on surface water quantity	– Predicted change in drainage areas and land use	– The existing hydrologic conditions at the site and surrounding areas are well understood (i.e., surface water flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and their previous quarries. – A 3rd on-site lagoon for aeration and eventual discharge would be required for this alternative option. – An additional force main is required to transport the leachate to a new pre-treatment lagoon. Potential for a failure of the force main, such as a breakage with discharge of leachate to the natural environment.	– Pre-treatment and equalization storage volume and area is required for flow pacing. – On-site pre-treatment lagoon to provide flow equalization and post to pre- peak flow matching. – No mitigation measures are required.	– No effect to surface water quantity at property boundaries. **NO NET EFFECTS**
		– Predicted occurrence and degree of off-site effects	– The existing hydrologic conditions at the site and surrounding areas are well understood (i.e., surface water flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and their previous quarries. – Once treated at the on-site lagoons, leachate will be conveyed via an existing force/gravity main to the Niagara-on-the-Lake sanitary sewer system for final treatment at the Region of Niagara's Port Weller Wastewater Treatment Plant. Potential for a failure of the existing force main with the added discharge capacity, such as a breakage with discharge of leachate volume to the natural environment.	– Pre-treatment and equalization storage volume and area is required for discharge flow management. – On-site lagoon to provide flow equalization prior to discharge to off-site receivers. – No mitigation measures are required.	– No effect to surface water quantity at off-site receivers. **NO NET EFFECTS**
Atmospheric - Air Quality, Odour and Noise	Effect of air quality on off-site receptors	– Predicted off-site point of impingement concentrations ($\mu g/m^3$) of indicator compounds	– Continued use of the municipal wastewater treatment system is not expected to have any impacts on dust, combustion byproduct, or blowing litter from the site. – Leachate can be a source of VOC emissions. The proposed third leachate lagoon has the potential to be a source of fugitive emissions which may slightly increase predicted concentration at northern and eastern receptors. – Maintenance holes associated with the collection system can be source of fugitive emissions however are typically insignificant compared to other emission sources. No impact on predicted concentrations is expected.	– Leachate collection system maintained under negative pressure. – Leachate best management practices continue to be enforced and are adapted to include the additional infrastructure.	– No change to predicted off-site concentrations is expected from the continued use of the municipal wastewater treatment system for dust, combustion byproducts, and blowing litter. – Minor increases in predicted VOC concentrations compared to existing conditions. **LOW NET EFFECTS**
		– Number of off-site receptors potentially affected (residential properties, public facilities, businesses, and institutions)	– The number of receptors affected is not expected to change with the addition of the third leachate lagoon and additional collection infrastructure as they are located in the same area as the existing infrastructure.	– Leachate collection system maintained under negative pressure. – Leachate best management practices continue to be enforced and are adapted to include the additional infrastructure.	– No change to the number of affected receptors. **LOW NET EFFECTS**
		– Frequency of any exceedance of applicable standards, limits, or guidelines at identified receptors.	– The frequency of any exceedance at off-site receptors may increase slightly for VOCs. However, no substantial change from existing conditions is expected with the addition of the third leachate lagoon and additional collection infrastructure. Proposed operations are located in the same area as the existing infrastructure.	– Leachate collection system maintained under negative pressure. – Leachate best management practices continue to be enforced and are adapted to include the additional infrastructure.	– Potential for minor increases in the frequency of exceedances at off-site receptors. **LOW NET EFFECTS**
	Effect of odours on off-site receptors	– Predicted off-site odour concentrations (μg /m^3 and odour units)	– Leachate can be a source of odour emissions. The proposed third leachate lagoon has the potential to be a source of fugitive emissions which may increase predicted concentration at northern and eastern receptors. – Maintenance holes associated with the collection system can be source of fugitive emissions however are typically insignificant compared to other emission sources. No impact on predicted concentrations is expected.	– Leachate collection system maintained under negative pressure. – Leachate best management practices continue to be enforced and are adapted to include the additional infrastructure.	– Minor increases in predicted odour concentrations compared to existing conditions. **LOW NET EFFECTS**
		– Number of off-site receptors potentially affected (residential properties, public facilities, businesses and institutions)	– The number of receptors affected is not expected to change with the addition of the third leachate lagoon and additional collection infrastructure as they are located in the same area as the existing infrastructure.	– Leachate collection system maintained under negative pressure.	– No change to the number of affected receptors. **LOW NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				– Leachate best management practices continue to be enforced and are adapted to include the additional infrastructure.	
		– Frequency of any exceedance of applicable standards, limits, or guidelines at identified receptors	– The frequency of any exceedance at off-site receptors may increase slightly but is not expected to change substantially from existing conditions with the addition of the third leachate lagoon and additional collection infrastructure as they are located in the same area as existing treatment infrastructure and the increase in emissions is expected to be minor.	– Leachate collection system maintained under negative pressure. – Leachate best management practices continue to be enforced and are adapted to include the additional infrastructure.	– Potential for minor increases in the frequency of exceedances at off-site receptors. **LOW NET EFFECTS**
	Effect of noise on off-site receptors	– Predicted off-site noise level	– Noise level may exceed applicable noise guidelines from time to time – Additional leachate sump pump noise levels add to the overall facility sound level – Additional lagoon aeration system noise levels add to the overall facility sound level – Earthworks related to lagoon excavation may temporarily increase sound levels at neighbouring receptors	– Construction of enclosures or barriers around equipment to shield receptors that may experience elevated noise levels exceeding noise guidelines. For example, install sump pump below grade within sump well or within an enclosure and/or contain aeration air blower/pump system within an enclosure – Limit construction activities to daytime hours of 07:00 to 22:00	– Predicted noise levels are expected to meet applicable guidelines during operating hours **LOW NET EFFECTS**
		– Number of off-site receptors potentially affected (residential properties, public facilities, businesses, and institutions)	– Seven residential receptors identified for predicted sound level evaluation – Vacant lots adjacent to landfill	– Locate new pump and aeration system near existing water treatment pump infrastructure, away from neighbouring receptors	– Predicted noise levels are expected to meet applicable guidelines during operating hours **LOW NET EFFECTS**
		– Predicted sound from traffic	– No change in vehicle traffic expected	– Not applicable	– Not applicable **NO NET EFFECTS**
Terrestrial and Aquatic Environment Rationale	Effect on terrestrial ecosystems	– Predicted impact on vegetation communities	– Potential removal or disturbance to low quality roadside hedgerow and ditch for installation of new forcemain. – Leachate contamination and toxicity causing altered growth, survival and community structure.	– Minimize the required footprint of vegetation clearing and demarcate the limits clearly in the field. – Implement a Construction Environmental Management Plan. – Restore and enhance habitat post-construction. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs.	– No significant adverse net effects are anticipated with implementation of the mitigation measures. **LOW NET EFFECTS**
		– Predicted impact on wildlife habitat	– Removal of low quality cover and foraging and nesting habitat associated with the hedgerow and roadside ditch. – Leachate contamination and toxicity altering habitat structure and function.	– Implement measures described above for *Predicted impact on vegetation communities.* – Adhere to applicable wildlife related timing windows to avoid habitat damage during core sensitive periods: • Migratory birds: April 1 – August 31, Bats: April 1 – September 30.	– No significant adverse net effects are anticipated with implementation of the mitigation measures. **LOW NET EFFECTS**
		– Predicted impact on vegetation and wildlife including rare, threatened or endangered species	– Potential removal of bat roosting habitat in the hedgerow. – Leachate contamination and toxicity impacting growth and survival of species.	– Implement measures described above for *Predicted impact on vegetation communities* and *Predicted impact on wildlife habitat.* – Maintain compliance with the ESA, SARA, and Migratory Birds Convention Act during all project phases, including construction and operations. – Survey the footprint prior to construction to confirm the absence of any rare,	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures **LOW NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				threatened, or endangered species, or suitable habitat, including suitable roosting habitat; conduct habitat use studies if required based on the habitat screening. – If species are present, undertake required habitat and species protection and restoration actions, as needed, according to applicable legislation or on the advice of a qualified biologist.	
	Effect on aquatic ecosystems	– Predicted impact on aquatic habitat	– Work near aquatic habitat is not anticipated for this project component. – Contamination of receiving waterbodies from a leachate leak may alter the habitat/ecosystem.	– Implement a Construction Environmental Management Plan. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs	– No significant adverse net effects are anticipated with implementation of the mitigation measures. **LOW NET EFFECTS**
		– Predicted impact on aquatic biota	– Work near aquatic habitat is not anticipated for this project component. – Potential toxicity to aquatic biota from leachate contamination in surface or groundwater entering aquatic habitats in the surrounding area.	– Implement a Construction Environmental Management Plan. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs.	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**
	Effect on culturally significant species to Indigenous peoples, and rare (vulnerable), threatened or endangered species of flora or fauna or their habitat	– Predicted impact on culturally significant, rare, threatened, or endangered flora and fauna species and their habitat	– Potential removal of foraging, cover, movement habitat associated with ditch and hedgerow that may be used by culturally significant wildlife species – Potential removal of plant species of cultural significance – Toxicity from leachate contamination affecting growth and survival of species	– Implement the Impact Management Measures for *Effect on Terrestrial Ecosystems* and *Effect on Aquatic Ecosystems.* – Survey the footprint prior to construction for plant species of cultural significance and transplant or salvage as appropriate, in consultation with Indigenous participants. – Restore and enhance habitat post-construction.	– No significant adverse net effects are anticipated with implementation of mitigation measures **LOW NET EFFECTS**
	Effect on wetlands	– Predicted impact on wetlands	– Work near wetlands is not anticipated for this project component. – Toxicity from leachate contamination in surface or groundwater entering wetlands in the surrounding area may affect growth and survival of wetland plants and wildlife	– Implement a Construction Environmental Management Plan. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**
	Effect on wildlife habitat, populations, corridors or movement	– Predicted impact on wildlife habitat, populations, corridors or movement	– Potential removal or disturbance to low quality roadside hedgerow and ditch for installation of new forcemain. – Leachate contamination and toxicity causing altered growth, survival and community structure.	– Implement the Impact Management Measures for Effect on Terrestrial Ecosystems.	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**
	Effect on fish or their habitat, spawning, movement or environmental conditions (e.g., water	– Predicted impact on fish, fish habitat, spawning behaviour, movement or environmental conditions	– Work near fish habitat is not anticipated for this project component. – Potential toxicity to fish and modified habitats due to potential leachate contamination in surface or groundwater entering aquatic habitats from the surrounding area.	– Implement a Construction Environmental Management Plan. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs.	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
	temperature, turbidity, etc.)				
	Effect on locally important or valued ecosystems or vegetation	– Predicted impact on locally important or valued ecosystems or vegetation	– Potential removal of foraging, cover, movement habitat associated with ditch and hedgerow that may be used by culturally significant wildlife species – Potential removal of plant species of cultural significance – Potential leachate leak into locally valued ecosystems modifying the species composition and community structure.	– Implement a Construction Environmental Management Plan. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs.	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**
Built Environment					
Land Use	Effect on existing and proposed planned future land uses and associated infrastructure	– Current and planned future land use	– Option A would require minimal land area for additional leachate management infrastructure and would largely utilize existing infrastructure features (i.e. leachate ponds). Leachate treatment is largely managed off-site within an existing industrial area and consolidated with municipal treatment. – Option A takes capacity and growth projections into account. Under leachate flow projections and 2051 flows for high-density growth projections within the Glendale Secondary Plan area, the Municipal- owned sewers have sufficient capacity to safely convey the 10-year design storm. – Given the location and change in use of the lands, approvals will be triggered to implement this Option, including but are not limited to: • Approvals under the Niagara Escarpment Planning and Development Act. • Approvals under the Aggregate Resources Act. • Approvals under the Planning Act, if the aggregate licence is surrendered. – With these considerations, no land use related effects are expected on current and planned future land uses as well as off-site sensitive land uses as a result of implementing Option A.	– No impact management measures recommended.	– There are no land use related effects expected as a result of implementing Option A. **NO NET EFFECTS**
		– Proximity to off-site sensitive land uses (e.g., dwellings, churches, parks) and features (e.g., wetlands, woodlots, etc.)	– The closest existing sensitive land use comprises of rural residential use, which is located beyond 1,175m from Option A. – Option A is expected to have no potential effect on off-site sensitive land uses, as treatment is largely managed off-site within an existing industrial area and consolidated with municipal treatment.	– No impact management measures recommended.	– There are no land use related effects expected as a result of implementing Option A. **NO NET EFFECTS**
		– Proximity to features (e.g., wetlands, woodlots, etc.)	– Potential effects to natural features will be assessed within the Terrestrial and Aquatic Environment component. – According to the Niagara Region Official Plan (Schedule C2), nearby natural heritage features comprise of the following: • Significant Woodlands • Other Woodlands • Provincially Significant Wetlands • Other Wetlands / Non-Provincially Significant Wetlands • Permanent and Intermittent Streams • From a land use perspective, no potential effects to natural features are expected.	– Potential effects to natural features can be mitigated through application of landfill operation best management practices and impact management measures from other environmental components. – Consider opportunities to restore/enhance connectivity whether through design of vegetative screening or otherwise, and prioritize locally native species in any plantings.	– There are no land use related effects expected as a result of implementing Option A. **NO NET EFFECTS**
	Effect on views of the facility	– Predicted changes in views of the facility from the surrounding area	– No changes to views of the lagoons are expected from the addition of a third lagoon.	– No additional impact management measures are required if existing berm and vegetation are retained.	– No changes to existing views of the facility are expected. **NO NET EFFECTS**
		– Visibility of project features from selected receptor locations	– The lagoon is not expected to be visible from viewpoints outside the Walker Campus.	– No additional impact management measures are required if existing berm and vegetation are retained.	– Lagoon is not expected to be visible from outside the Walker Campus. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
		– Level of visual contrast of project features from selected receptor locations	– The lagoon is not expected to be visible from viewpoints outside the Walker Campus. – The lagoon would be situated adjacent existing lagoons and within the Walker Campus where the visual landscape is characterized by a variety of aggregate and waste management operations. As such, the introduction of an additional lagoon would not be perceived as in contrast to the existing visual landscape.	– No additional impact management measures are required if existing berm and vegetation are retained.	– An additional lagoon at the proposed location is not expected to alter the existing visual character. **NO NET EFFECTS**
Agriculture	Effects on existing agricultural land base	– CLI soil capability classification	– No Effect. Lands already disturbed and have no agricultural capability.	– No impact management measures required.	– No effect on CLI Capability. **NO NET EFFECTS**
		– Soil suitability classification	– No Effect. Lands already disturbed and have no agricultural capability.	– No impact management measures required.	– No effect on Soil Suitability. **NO NET EFFECTS**
		– Climate	– No anticipated effects to microclimatic conditions.	– No impact management measures required.	– No effects to microclimatic conditions. **NO NET EFFECTS**
		– Level of fragmentation	– No anticipated effects associated with fragmentation.	– No impact management measures required.	– No effect associated with fragmentation as lot creation is not proposed. **NO NET EFFECTS**
		– Proximity to non-farm land uses	– No anticipated effects to surrounding non-agricultural operations.	– No impact management measures required.	– No impacts on surrounding non-agricultural operations. **NO NET EFFECTS**
		– End use agricultural area	– No effect – lands not currently used for agriculture.	– No impact management measures required.	– No impact on existing agricultural areas. **NO NET EFFECTS**
	Effects on agri-food network	– Type(s) and proximity of agricultural operations	– Agricultural operations are well removed from the site, with the nearest active operation being a nursery.	– No impact management measures required.	– No impacts on surrounding agricultural operations. **NO NET EFFECTS**
		– Type(s) and proximity of agricultural related facilities	– No agriculture-related uses located within Local Study Area.	– No impact management measures required.	– No impacts on surrounding agriculture-related operations. **NO NET EFFECTS**
		– Predicted impacts on surrounding agricultural operations & agricultural related facilities	– No anticipated effects to surrounding agricultural operations.	– No impact management measures required.	– No impacts on surrounding agricultural operations. **NO NET EFFECTS**
Social Environment					
Transportation	Effect on traffic	– Operational level of service at intersections around the campus	– Leachate management does not impact operational level on traffic.	– No improvements are recommended.	– No change in operational level of service. **NO NET EFFECTS**
	Road safety and geometry	– Traffic collision assessment	– Leachate management does not impact expected and predicted collision frequency.	– No improvements are recommended.	– No change in safety conditions. **NO NET EFFECTS**
		– Vertical and horizontal sightlines	– Leachate management does not impact horizontal and vertical sightlines.	– No improvements are recommended.	– No change in horizontal and vertical sightlines. **NO NET EFFECTS**
Social Environment	Displacement of Residents from Houses	– The number of households/residents (property owners and tenants) to be displaced (i.e., forced relocation) by the project itself regardless of whether their property has been purchased or not	– There are no households/residents within the Walker Industries Niagara Campus boundary. No displacement (i.e., forced relocation) required.	– None warranted.	– No displacement (i.e., forced relocation) required. **NO NET EFFECTS**
		– The potential for or likelihood of voluntary out migration of residents for consideration of the indirect effects on community character and cohesion	– Continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project is not likely to result in a material change in public attitudes towards the South Landfill (Phase 2) Project and potentially motivate some people to out-migrate voluntarily.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to:	– Residents are not expected to be motivated to out-migrate voluntarily. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				• The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	
	Disruption to use and enjoyment of residential properties	– The number of existing residential households and/or future households that are located at specific receptor locations and potentially affected by noise, dust, odour, traffic, agricultural and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls	– Continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project is not likely to be a major additional source of noise, dust, odour, traffic, agricultural and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls that might result in disruption to the use and enjoyment of residential property.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Disruption to use and enjoyment of residential property is not anticipated. **NO NET EFFECTS**
		– The number of existing residential households fronting/backing onto a haul route and potentially affected by changes in project related traffic and traffic noise	– Leachate will not be transported off-site via trucks. Therefore, no changes in traffic or traffic noise are anticipated.	– None warranted.	– No changes in traffic or traffic noise are anticipated. **NO NET EFFECTS**
		– Potential for or likelihood of changes in peoples' use of residential property	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in a change in people's use of residential property.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– No changes to peoples' use of residential property are anticipated. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
	Disruption to use and enjoyment of public facilities and institutions	– The number of existing public facilities and institutions that may be affected by nuisance factors such as noise, dust, odour, traffic and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in disruption to four public facilities and institutions nearby the Niagara Campus along Thorold Townline Road	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in disruption to four public facilities and institutions nearby the Niagara Campus along Thorold Townline Road. **NO NET EFFECTS**
		– Potential for or likelihood of changes in operations of public facilities and institutions	– Continued use of existing municipal treatment and disposal systems will not result in a material reduction in the capacity of the existing Niagara-on-the-Lake sanitary sewer system and the Region of Niagara's Port Weller Wastewater Treatment Plant to the extent that operations would be constrained. – Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in disruption to four public facilities and institutions nearby the Niagara Campus along Thorold Townline Road	– None Warranted. – Walker Environmental Group will continue to pay for the treatment services provided by local and regional municipalities.	– Continued use of existing municipal treatment and disposal systems will not result in a material reduction in the capacity of the existing Niagara-on-the-Lake sanitary sewer system and the Region of Niagara's Port Weller Wastewater Treatment Plant. **NO NET EFFECTS**
		– Potential for or likelihood of changes in use and enjoyment of public facilities and institutions	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four public facilities and institutions north and west of the Niagara Campus nearest to proposed additional leachate pond.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four public facilities and institutions north and west of the Niagara Campus nearest to proposed additional leachate pond. **NO NET EFFECTS**
	Loss/disruption of recreational resources	– The number/nature of existing recreational resources and/or future features potentially affected by noise, dust, odour, visual effects and changes in project-related traffic; and the potential for and likelihood of changes in the presence of vermin and gulls	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	enjoyment of the four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond. **NO NET EFFECTS**
		– Potential for or likelihood of changes in operations of recreational features	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the operations at four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the operations at four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond. **NO NET EFFECTS**
		– Potential for or likelihood of changes in use and enjoyment of recreational resources	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond **NO NET EFFECTS**
	Changes to community character	– Compatibility of landfill operations with the existing and likely future character of the community	– Continued use of existing municipal wastewater treatment system is compatible with the existing and likely future character of the community for the following reasons: • Leachate treatment ponds have operated at the Niagara Campus since the 1980's and are not considered new or unfamiliar to community members. Option A represents a continuation of an existing industrial activity on the Niagara Campus.	– None warranted.	– Continued use of existing municipal wastewater treatment system is compatible with the existing and likely future character of the community. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
			• An additional leachate treatment pond is not expected to substantially affect features that support community character, nor to substantially affect features or issues that are negative influences on community character.		
		– Compatibility of the proposed end use with the existing and likely future character of the community	– Continued use of existing municipal wastewater treatment system does not affect the proposed agriculture end use and is therefore compatible with the existing and likely future character of the community.	– None warranted.	– Continued use of existing municipal wastewater treatment system does not affect the proposed agriculture end use and is therefore compatible with the existing and likely future character of the community. **NO NET EFFECTS**
	Changes to community cohesion	– The extent of displacement	– Continued use of existing municipal wastewater treatment system does not required any displacement (i.e., forced relocation).	– None warranted.	– Adverse effects on community cohesion are not likely because no displacement (i.e., forced relocation) is required. **NO NET EFFECTS**
		– The potential for or likelihood of voluntary out migration	– Adverse effects on community cohesion are not likely for the following reasons: • Very few LSA residents are expected to be motivated to out-migrate voluntarily. • Those who might out-migrate voluntarily are likely to be replaced by others who would contribute to community cohesion in their own ways.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Adverse effects on community cohesion are not likely because very few LSA residents are expected to be motivated to out-migrate voluntarily. **NO NET EFFECTS**
		– Loss and the extent of disruption of recreational resources, public facilities and institutions, and the use and enjoyment of residential properties	– Adverse effects on community cohesion are not anticipated because no community features that contribute to community cohesion will be displaced. – Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls are not expected to be of sufficient magnitude, duration or frequency to result in a change in operations at nearby recreational resources, public facilities or institutions, nor the use and enjoyment of residential properties.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Adverse effects on community cohesion are not likely because no community features that contribute to community cohesion will be displaced and nuisance effects are not expected to be of sufficient magnitude to change their operations, nor the use and enjoyment of residential properties. **NO NET EFFECTS**
Economic Environment					

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
Economic Environment	Effect on local economy	– Impact on businesses • Disruption/displacement of businesses (including tourism and farms) • Business opportunities	– No businesses or farms are anticipated to be displaced/disrupted by the expansion of the existing leachate system. – Business opportunities associated with construction of the expanded leachate system through contracting and service providers.	– No mitigation measures required	– No business or farm displacement, and no disruption. Business opportunities related to construction of the expanded leachate system through contracting and service providers. **LOW POSITIVE EFFECT**
		– Labour market impacts • Impact on direct, indirect, and induced employment	– Employment generated during construction of the expanded leachate system, encompassing direct, indirect, and induced jobs.	– No mitigation measures required	– Employment generated during construction of the expanded leachate system encompassing direct, indirect, and induced jobs. **LOW POSITIVE EFFECT**
		– GDP impacts • Impact on direct, indirect, and induced GDP • Retention of economic benefits within local economy	– GDP generated during construction of the expanded leachate system, encompassing direct, indirect, and induced economic activity. – Economic activity is expected to be largely retained within the local and regional economy.	– No mitigation measures required	– GDP generated during construction of the expanded leachate system, encompassing direct, indirect, and induced economic activity, with benefits largely retained within the local and regional economy. **LOW POSITIVE EFFECT**
	Effect on real estate	– Property value impacts	– No effect.	– No mitigation measures required	– No effect on property values. **NO EFFECT**
	Effect on public finance	– Impact on municipal revenue	– Annual revenue generated by the Town of Niagara-on-the-Lake through a volumetric charge to Walker for the discharge of up to 104,500 m³/year of leachate to the sanitary sewer system.	– No mitigation measures required	– Annual municipal revenue generated through volumetric charges to Walker for up to 104,500 m³/year of leachate discharged to the sanitary sewer system. **LOW POSITIVE EFFECT**
		– Impacts on municipal cost	– Annual cost is incurred by the Town of Niagara-on-the-Lake, paid to the Region of Niagara, for the conveyance and treatment of up to 104,500 m³/year of leachate at the Port Weller Wastewater Treatment Plant.	– No mitigation measures required	– Annual municipal cost incurred for conveyance and treatment of leachate. **LOW EFFECT**
		– Impact on assessment base	– No effect.	– No mitigation measures required	– No effect on assessment base. **NO EFFECT**
	Cost of services	– Impact on customer cost of waste services	– Little to no change in tipping fees is expected for the recovery of capital costs associated with the expanded leachate management system, combined with ongoing volumetric charges for discharge to the sanitary sewer.	– No mitigation measures required	– Little to no impact on customer cost of waste services. **LOW EFFECT**
Cultural Environment					
Cultural Heritage Resources	Effect on known or potential built heritage resources and cultural heritage landscapes	– Number of known and potential built heritage resources and cultural heritage landscapes displaced or disrupted	– No effect.	– Not applicable	**NO NET EFFECTS**
	Effect on archaeological resources and areas of archaeological potential	– Area (ha) of archaeological potential (i.e., areas with the likelihood to contain archaeological resources)	– Including effects of the Landfill Configuration Options, potential adverse effects on an additional 0.28 ha of area with archaeological potential that may contain previously unidentified archaeological resources with cultural heritage value or interest.	– Conduct a Stage 2 archaeological assessment within all affected areas of archaeological potential in order to identify any archaeological resources that may be present in advance of any adverse effects. Any archaeological resources identified may require further work depending on their cultural heritage value or interest.	– Areas of archaeological potential will be addressed prior to potential adverse effects to determine appropriate mitigation measures for any archaeological resources with cultural heritage value or interest. **NO NET EFFECTS**
		– Number and type of archaeological sites affected	– Including effects of the Landfill Configuration Options, potential adverse effects on previously unknown archaeological sites within areas of archaeological potential.	– Any archaeological resources identified during a Stage 2 archaeological survey with cultural heritage value or interest will be subject to a Stage 3 site-specific	– Potential adverse effects to potential archaeological resources with cultural heritage value or interest would be mitigated either through avoidance and protection or further excavation.

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				assessment and Stage 4 mitigation of development impacts where necessary.	**NO NET EFFECTS**

Table C-2

Net Effects Analysis of Leachate Management Option B

Leachate Management Option B

Table C. 2 ***Leachate Management Option B Potential Environmental Effects, Mitigation Measures and Net Effects***

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
Natural Environment					
Geology / Hydrogeology	Effect on groundwater flow	– Predicted effects to groundwater flow at property boundaries and off-site	– The existing hydrogeologic conditions at the site and surrounding areas are well understood (i.e., groundwater flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and previous quarries. – The current on-site lagoons are lined and are hydraulically separated from the natural groundwater systems. However, construction of the on-site wastewater treatment infrastructure, including foundations and conveyance for the treated effluent discharge, may locally affect (reduce) groundwater levels northwest of the site and directly north of the East Landfill. This could result in a loss of inward gradient directly north of the East Landfill without mitigation measures. – The current hydrogeologic conditions around the remainder of the campus will remain unchanged, with groundwater in the various bedrock units drawn to the existing GWCS. The current flow regimes and inward hydraulic gradients toward the site within the key bedrock units (Lockport dolostone and Rochester shale) will be maintained. – As groundwater levels in the various bedrock units will remain unchanged with mitigation measures, off-site residential groundwater supplies will not be negatively impacted.	– Design the facilities and utilize construction methods to avoid reducing groundwater levels in the area of the on-site wastewater treatment plant (e.g. limit deep foundations or trenches, avoid dewatering, etc.).	– No effect to groundwater flow at property boundaries and off-site **NO NET EFFECTS**
	Effect on groundwater quality	– Predicted effects to groundwater quality at property boundaries and off-site	– The existing hydrogeologic conditions at the site and surrounding areas are well understood (i.e., groundwater flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and previous quarries. The current hydrogeologic conditions at the campus will remain unchanged, with inward hydraulic gradients maintained toward the site within the key bedrock units (Lockport dolostone and Rochester shale). – The current on-site lagoons are lined and are hydraulically separated from the natural groundwater systems. The potential for leachate or chemical releases at on-site wastewater treatment plant will be mitigated through appropriate spill containment facilities. – Groundwater movement in the shallow bedrock underlying the landfill is influenced by the GWCS, and/or a future sub-drain system, maintaining the inward hydraulic gradients toward the site and providing predictable groundwater flow direction below the landfill. – Groundwater in the lower Irondequoit limestone bedrock is hydraulically separated from groundwater below the landfill by the Rochester shale, which acts as a regional aquitard. As such, groundwater in the Irondequoit limestone will not be affected. – As the groundwater hydraulic gradients are inward toward the site, off-site groundwater receptors will be upgradient of the site and will not be affected.	– No mitigation measures are required, beyond including appropriate spill containment in the design.	– No effect to groundwater quality at property boundaries and off-site **NO NET EFFECTS**
Surface Water	Effect on surface water quality	– Predicted effects on surface water quality on-site and off-site	– The existing hydrologic conditions at the site and surrounding areas are well understood (i.e., surface water flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and previous quarries. – Effluent water quality treated during operations is expected to be suitable for local discharge to the Old Welland Canal and managed by an Industrial Sewage Works Environmental Compliance Approval (ECA); however, some parameters may not be feasibly treated under Best Available Technologies Economically Achievable (BATEA, e.g. chloride concentration). – For this leachate management alternative, the approvals associated with surface water disposal, and the costs associated with the required infrastructure construction and operation, may be higher compared to continued use of the	– Mitigation measures may be required to address chemicals that cannot be feasibly treated under BATEA. – Feasibility study would need to be completed to determine environmental effects and both the capital and operating costs for this leachate management alternative in comparison to Option A.	– Feasibility study needed to inform the net effects of the potential onsite wastewater treatment plant. Assuming the feasibility study does not conclude there will be additional potential effects, this option will likely result in no to low net effects with respect to surface water resources. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
			municipal wastewater treatment system. A feasibility study would need to be completed to understand the effects of this alternative option. Treatment pilot studies may be required before operation of this alterative option. – Agency and public perception of a treated effluent discharge into the Old Welland Canal, may not be as favourable as the previous option. – Throughout the lifecycle of the landfill, leachate strength will vary as the volume of waste in the landfill increases, which will gradually change the treatment requirements.		
	Effect on surface water quantity	– Predicted change in drainage areas and land use	– The existing hydrologic conditions at the site and surrounding areas are well understood (i.e., surface water flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and their previous quarries. – The construction of a waste disposal facility can disrupt natural surface water drainage patterns, causing a potential for increased flooding. – An approximate area of 6.5 ha would be required to accommodate the new on-site wastewater treatment plant and would be located within the existing Campus boundary.	– On-site wastewater treatment plant to provide flow equalization and post to prepeak flow conditions. – No mitigation measures are required.	– No effect to surface water quantity at property boundaries. **NO NET EFFECTS**
		– Predicted occurrence and degree of off-site effects	– The existing hydrologic conditions at the site and surrounding areas are well understood (i.e., surface water flow and quality are determined and predictable) through decades of studies and monitoring at the East Landfill, South Landfill and their previous quarries. – The construction of a waste disposal facility can disrupt natural surface water drainage patterns, causing a potential for increased flooding to off-site receivers. As the waste disposal facility may need to handle a maximum capacity of approximately 104,500 m3 per year during operations, discharge rates to the Old Welland Canal may range up to approximately 12,000 L/hr (200 L/min).	– On-site wastewater treatment plant to provide post- to prepeak flow conditions to offsite receivers. – No mitigation measures are required.	– No effect to surface water quantity at off-site receivers. **NO NET EFFECTS**
Atmospheric - Air Quality, Odour and Noise	Effect of air quality on off-site receptors	– Predicted off-site point of impingement concentrations ($\mu g/m^3$) of indicator compounds	– Construction of an on-site leachate treatment facility introduces the third leachate lagoon included in Option A as well as new emission sources including pre-treatment, biological treatment, chemical treatment, and tertiary treatment. It also generates new waste streams in the forms of sludge and off-spec system discharge. – Construction of an on-site leachate treatment facility is not expected to have any impacts on dust, combustion byproduct, or blowing litter from the site. – Open processes like the existing aerated lagoons and proposed biological and chemical treatment are potential sources of VOC emissions. Additional treatment on-site has the potential to increase the predicted concentrations at off-site receptors. – Contribution to off-site predicted concentrations from treatment operations are expected to be minor compared to other sources. – The proposed location for the treatment plant is located in the same area as the existing leachate lagoons. – Overall, impacts on VOC contributions are expected to be similar to existing conditions.	– Leachate collection system maintained under negative pressure. – Leachate best management practices continue to be enforced and are adapted to include the additional infrastructure. – Revise and update best management practices to include new treatment operations. – Implement best design practices and control technologies where appropriate to minimize release of VOCs from the treatment process.	– No change to predicted off-site concentrations is expected for the construction of the proposed leachate treatment facility for dust, combustion byproducts, and blowing litter. – Minor increases in predicted VOC concentrations compared to existing conditions. **LOW NET EFFECTS**
		– Number of off-site receptors potentially affected (residential properties, public facilities, businesses, and institutions)	– The number of receptors affected is not expected to change with the addition of the leachate treatment facility as it is located in the same area as the existing infrastructure.	– Same as above.	– No change to the number of affected receptors. **LOW NET EFFECTS**
		– Frequency of any exceedance of applicable standards, limits, or guidelines at identified receptors.	– The frequency of any exceedance at off-site receptors may increase slightly but is not expected to change substantially from existing conditions with the construction of the leachate treatment facility as it would be located in the same area as existing treatment infrastructure and the increase in emissions is expected to be minor.	– Same as above.	– Potential for minor increases in the frequency of exceedances at off-site receptors. **LOW NET EFFECTS**
	Effect of odours on off-site receptors	– Predicted off-site odour concentrations ($\mu g /m^3$ and odour units)	– Open processes like the existing aerated lagoons and proposed biological and chemical treatment and waste product storage are potential sources of odour	– Leachate collection system maintained under negative pressure.	– Minor increases in predicted odour concentrations compared to existing conditions.

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
			emissions. Additional treatment on-site has the potential to increase the predicted concentrations at off-site receptors. – Contribution to off-site predicted concentrations from treatment operations are expected to be minor compared to other sources. – The proposed location for the treatment plant is located in the same area as the existing leachate lagoons. – Overall, impacts on odour contributions are expected to be similar to existing conditions.	– Leachate best management practices continue to be enforced and are adapted to include the additional infrastructure. – Revise and update best management practices to include new treatment operations. – Implement best design practices and control technologies where appropriate to minimize release of odour from the treatment process.	**LOW NET EFFECTS**
		– Number of off-site receptors potentially affected (residential properties, public facilities, businesses and institutions)	– The number of receptors affected is not expected to change with the addition of the leachate treatment facility as it would be located in the same area as the existing infrastructure.	– Same as above.	– No change to the number of affected receptors. **LOW NET EFFECTS**
		– Frequency of any exceedance of applicable standards, limits, or guidelines at identified receptors	– The frequency of any exceedance at off-site receptors may increase slightly but is not expected to change substantially from existing conditions with the construction of the leachate treatment facility as it would be located in the same area as existing treatment infrastructure and the increase in emissions is expected to be minor.	– Same as above.	– Potential for minor increases in the frequency of exceedances at off-site receptors. **LOW NET EFFECTS**
	Effect of noise on off-site receptors	– Predicted off-site noise level	– Noise level may exceed applicable noise guidelines from time to time – Wastewater treatment plant construction equipment sound levels may temporarily increase sound levels at neighbouring receptors	– Housing pump and equipment within buildings – Contain lagoon aeration air blower/pump systems within an enclosure – Limit construction activities to daytime hours of 07:00 to 22:00 – Development and adherence to construction noise management plan to limit impact and tonal noise (i.e., foundation piling and back-up beepers) that are typically sources of noise complaints during construction – Maintain equipment in good working order – Internal combustion engines are fitted with mufflers	– Predicted noise levels are expected to meet applicable guidelines during operating hours **LOW NET EFFECTS**
		– Number of off-site receptors potentially affected (residential properties, public facilities, businesses, and institutions)	– Seven residential receptors identified for predicted sound level evaluation – Vacant lots adjacent to Walker lands	– Equipment within buildings to reduce operational sound levels at neighbouring receptors	– Predicted noise levels are expected to meet applicable guidelines during operating hours **LOW NET EFFECTS**
		– Predicted sound from traffic	– No change in vehicle traffic expected	– Not applicable	– Not applicable **NO NET EFFECTS**
Terrestrial and Aquatic Environment Rationale	Effect on terrestrial ecosystems	– Predicted impact on vegetation communities	– Potential removal or disturbance to low quality roadside hedgerow and ditch for installation of new forcemain. – Potential vegetation removal and disturbance for the treatment water outfall into the valley of the Welland Canal. – Leachate contamination and toxicity causing altered growth, survival and community structure.	– Minimize the required footprint of vegetation clearing and demarcate the limits clearly in the field. – Implement a Construction Environmental Management Plan. – Restore and enhance habitat post-construction. Consider compensation habitat, if needed, depending on the final design and footprint. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. Remediate as necessary if a release occurs.	– No significant adverse net effects are anticipated with implementation of the mitigation measures. **LOW NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
		– Predicted impact on wildlife habitat	– Removal of low quality cover and foraging and nesting habitat associated with the hedgerow and roadside ditch for installation of new forcemain. – Potential vegetation removal and habitat disturbance for the treatment water outfall into the valley of the Welland Canal. – Leachate contamination and toxicity	– Implement measures described above for Predicted impact on vegetation communities. – Adhere to migratory bird and bat timing windows for vegetation clearing (no work within April 1 to September 30). – Erect exclusion fencing around work zone to minimize intrusion of wildlife into the work zone. – Restore and enhance habitat post-construction.	– No significant adverse net effects are anticipated with implementation of the mitigation measures. **LOW NET EFFECTS**
		– Predicted impact on vegetation and wildlife including rare, threatened or endangered species	– Potential removal of bat roosting habitat in the hedgerow or treatment water outfall. – Leachate contamination and toxicity impacting growth and survival of species.	– Implement measures described above for *Predicted impact on vegetation communities* and *Predicted impact on wildlife habitat.* – Maintain compliance with the ESA, SARA, and Migratory Birds Convention Act during all project phases, including construction and operations. – Survey the footprint prior to construction to confirm the absence of any rare, threatened, or endangered species, or suitable habitat, including suitable roosting habitat; conduct habitat use studies if required based on the habitat screening. – If species are present, undertake required habitat and species protection and restoration actions, as needed, according to applicable legislation or on the advice of a qualified biologist.	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures **LOW NET EFFECTS**
	Effect on aquatic ecosystems	– Predicted impact on aquatic habitat	– Work near aquatic habitat is not anticipated for this project component, aside from a possible future outfall to the Welland Canal. Construction related impacts such as sedimentation and removal of aquatic/riparian habitat have the potential to occur. – Toxicity from leachate contamination can alter aquatic and riparian vegetation.	– Implement a Construction Environmental Management Plan. – Adhere to requirements of the Fisheries Act. – Restore disturbed habitat as soon as possible post-construction to minimize the risk of sedimentation of waterbodies. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs – Maintain surface and groundwater monitoring in the LSA.	– No significant adverse net effects are anticipated with implementation of mitigation measures **LOW NET EFFECTS**
		– Predicted impact on aquatic biota	– Work near aquatic habitat is not anticipated for this project component, aside from a possible future outfall to the Welland Canal. Construction related impacts such as sedimentation and removal of aquatic/riparian habitat have the potential to occur. – Potential toxicity to aquatic biota from leachate contamination in surface or groundwater entering aquatic habitats in the surrounding area.	– Implement a Construction Environmental Management Plan. – Instream works will be completed during the fisheries least risk timing windows, where applicable. – Avoid the harmful alteration, disruption or destruction (HADD) of fish habitat by making sure the Project Area avoids fish-bearing watercourses and Project activities do not disturb the integrity of the of the riparian area by maintaining an undisturbed vegetated buffer zone	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				between construction activities and the high-water mark – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs. – Maintain surface and groundwater monitoring in the LSA.	
	Effect on culturally significant species to Indigenous peoples, and rare (vulnerable), threatened or endangered species of flora or fauna or their habitat	– Predicted impact on culturally significant, rare, threatened, or endangered flora and fauna species and their habitat	– Potential removal of foraging, cover, movement habitat associated with ditch and hedgerow that may be used by culturally significant wildlife species – Potential removal of plant species of cultural significance – Toxicity from leachate contamination affecting growth and survival	– Implement Impact Management Measures described above for Predicted impact on vegetation communities and Predicted impact on wildlife. – Survey the footprint prior to construction for plant species of cultural significance and transplant or salvage as appropriate, in consultation with Indigenous participants. – Restore and enhance habitat post-construction.	– No significant adverse net effects are anticipated with implementation of mitigation measures **LOW NET EFFECTS**
	Effect on wetlands	– Predicted impact on wetlands	– Work near wetlands is not anticipated for this project component. – Toxicity from leachate contamination in surface or groundwater entering wetlands in the surrounding area may affect growth and survival of wetland plants and wildlife	– Implement the Impact Management Measures for Effect on Terrestrial Ecosystems. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**
	Effect on wildlife habitat, populations, corridors or movement	– Predicted impact on wildlife habitat, populations, corridors or movement	– Potential removal of foraging, cover, movement habitat associated with ditch and hedgerow, and Welland Canal valleyland. – Leachate contamination and toxicity causing altered growth, survival and community structure.	– Implement the Impact Management Measures for Effect on Terrestrial Ecosystems.	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**
	Effect on fish or their habitat, spawning, movement or environmental conditions (e.g., water temperature, turbidity, etc.)	– Predicted impact on fish, fish habitat, spawning behaviour, movement or environmental conditions	– Work near fish habitat is not anticipated for this project component. – Potential toxicity to fish and modified habitats due to potential leachate contamination in surface or groundwater entering aquatic habitats from the surrounding area.	– Implement the Impact Management Measures outlined in Effect on Aquatic Ecosystems.	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**
	Effect on locally important or valued ecosystems or vegetation	– Predicted impact on locally important or valued ecosystems or vegetation	– Potential removal of foraging, cover, movement habitat associated with ditch and hedgerow that may be used by culturally significant wildlife species. – Potential removal/disturbance to locally valued natural areas. – Potential removal of plant species of cultural significance – Potential leachate leak into locally valued ecosystems modifying the species composition and community structure.	– Implement a Construction Environmental Management Plan. – Inspect and maintain leachate management infrastructure frequently to minimize the potential for a leak. – Remediate as necessary if a release occurs	– No significant adverse net effects are anticipated with the implementation of the recommended mitigation measures. **LOW NET EFFECTS**
Built Environment					
Land Use	Effect on existing and proposed	– Current and planned future land use	– Option B would require a greater land area on-site (approximately 6.5 ha within the Walker campus) for additional leachate management infrastructure.	– No impact management measures recommended.	– There are no land use related effects expected as a result of implementing Option B.

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
	planned future land uses and associated infrastructure		– Option B involves more on-site treatment (adjacent to the existing treatment lagoons) and contains a new discharge location. – Overall, less reliance on the municipal system is expected with treatment largely managed on-site. – Given the location and change in use of the lands, approvals will be triggered to implement this Option, including but are not limited to: • Approvals under the Niagara Escarpment Planning and Development Act. • Approvals under the Aggregate Resources Act. • Approvals under the Planning Act, if the aggregate licence is surrendered. – Overall, given the proposed location and area of on-site treatment will be contained within the Walker campus surrounded by industrial uses and Walker-owned lands, no land use related effect is expected as a result of implementing Option B.		**NO NET EFFECTS**
		– Proximity to off-site sensitive land uses (e.g., dwellings, churches, parks) and features (e.g., wetlands, woodlots, etc.)	– The closest existing sensitive land use comprises of rural residential use, which is located beyond 1,075m from Option B. – Given the proposed location and area of on-site treatment will be contained within the Walker campus surrounded by industrial uses and Walker-owned lands, no land use related effect is expected as a result of implementing Option B.	– All applicable provincial standards will be complied with through the implementation of mitigation measures across other environmental components with regard to change of land use within the Site Study Area. – Potential nuisance impacts to sensitive uses (or sensitive zoned lots) can be further mitigated through application of landfill operation best management practices and impact management measures from other environmental components (i.e., noise, dust, traffic)	– There are no land use related effects expected as a result of implementing Option B. **NO NET EFFECTS**
		– Proximity to features (e.g., wetlands, woodlots, etc.)	– Potential effects to natural features will be assessed within the Terrestrial and Aquatic Environment component. – According to the Niagara Region Official Plan (Schedule C2), nearby natural heritage features comprise of the following: • Significant Woodlands • Other Woodlands • Provincially Significant Wetlands • Other Wetlands / Non-Provincially Significant Wetlands • Permanent and Intermittent Streams – From a land use perspective, no potential effects to natural features are expected.	– Potential effects to natural features can be mitigated through application of landfill operation best management practices and impact management measures from other environmental components. – Consider opportunities to restore/enhance connectivity whether through design of vegetative screening or otherwise and prioritize locally native species in any plantings.	– There are no land use related effects expected as a result of implementing Option B. **NO NET EFFECTS**
Visual	Effect on views of the facility	– Predicted changes in views of the facility from the surrounding area	– Based on the assumed dimensions of the facility, proposed location within the Walker Campus, and existing screening features (i.e., berms and vegetation), it is not expected that there will be views of the facility from areas outside the Campus. – Should the option be selected and the conceptual design advanced, changes in views of the facility should be considered, and where they are anticipated should be mitigated through application of standard visual screening measures (e.g., berms and vegetative screening).	– Retain existing visual screening features associated with the quarry. – Should the option be selected and the conceptual design advanced, changes in views of the facility should be considered, and where they are anticipated should be mitigated through application of standard visual screening measures (e.g., berms and vegetative screening).	– Views of the facility from outside the Walker Campus are not expected to change. Should elements of the facility become visible from viewpoints outside the Campus, it is expected impacts can be mitigated through standard visual screening measures. **NO NET EFFECTS**
		– Visibility of project features from selected receptor locations	– Based on the assumed dimensions of the facility, proposed location within the Walker Campus, and existing screening features (i.e., berms and vegetation), it is not expected that there will be views of the facility from areas outside the Campus.	– Retain existing visual screening features associated with the quarry. – Should the option be selected and the conceptual design advanced, changes in views of the facility should be considered, and where they are anticipated should be mitigated through application of standard	– Views of the facility from outside the Walker Campus are not expected to change. Should elements of the facility become visible from viewpoints outside the Campus, it is expected impacts can be mitigated through standard visual screening measures. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				visual screening measures (e.g., berms and vegetative screening).	
		– Level of visual contrast of project features from selected receptor locations	– The on-site wastewater treatment facility is not expected to be visible from viewpoints outside the Walker Campus. – The on-site wastewater treatment facility would be situated adjacent existing lagoons and within the Walker Campus where the visual landscape is characterized by a variety of aggregate and waste management operations. As such, the introduction of the facility would not be perceived as in contrast to the existing visual landscape.	– Retain existing visual screening features associated with the quarry. – Should the option be selected and the conceptual design advanced, changes in views of the facility should be considered, and where they are anticipated should be mitigated through application of standard visual screening measures (e.g., berms and vegetative screening).	– A wastewater treatment facility at the proposed location is not expected to alter the existing visual character. **NO NET EFFECTS**
Agriculture	Effects on existing agricultural land base	– CLI soil capability classification	– No Effect. Lands already disturbed and have no agricultural capability.	– No impact management measures required.	– No effect on CLI Capability. **NO NET EFFECTS**
		– Soil suitability classification	– No Effect. Lands already disturbed and have no agricultural capability.	– No impact management measures required.	– No effect on Soil Suitability. **NO NET EFFECTS**
		– Climate	– No anticipated effects to microclimatic conditions.	– No impact management measures required.	– No effects to microclimatic conditions. **NO NET EFFECTS**
		– Level of fragmentation	– No anticipated effects associated with fragmentation.	– No impact management measures required.	– No effect associated with fragmentation as lot creation is not proposed. **NO NET EFFECTS**
		– Proximity to non farm land uses	– No anticipated effects to surrounding non-agricultural operations.	– No impact management measures required.	– No impacts on surrounding non-agricultural operations. **NO NET EFFECTS**
		– End use agricultural area	– No effect – lands not currently used for agriculture.	– No impact management measures required.	– No impact on existing agricultural areas. **NO NET EFFECTS**
	Effects on agri-food network	– Type(s) and proximity of agricultural operations	– Agricultural operations are well removed from the site, with the nearest active operation being a nursery.	– No impact management measures required.	– No impacts on surrounding agricultural operations. **NO NET EFFECTS**
		– Type(s) and proximity of agricultural related facilities	– No agriculture-related uses located within Local Study Area.	– No impact management measures required.	– No impacts on surrounding agriculture-related operations. **NO NET EFFECTS**
		– Predicted impacts on surrounding agricultural operations & agricultural related facilities	– No anticipated effects to surrounding agricultural operations.	– No impact management measures required.	– No impacts on surrounding agricultural operations. **NO NET EFFECTS**
Social Environment					
Transportation	Effect on traffic	– Operational level of service at intersections around the campus	– Leachate management does not impact operational level on traffic.	– No improvements are recommended.	– No change in operational level of service. **NO NET EFFECTS**
	Road safety and geometry	– Traffic collision assessment	– Leachate management does not impact expected and predicted collision frequency.	– No improvements are recommended.	– No change in safety conditions. **NO NET EFFECTS**
		– Vertical and horizontal sightlines	– Leachate management does not impact horizontal and vertical sightlines.	– No improvements are recommended.	– No change in horizontal and vertical sightlines. **NO NET EFFECTS**
Social Environment	Displacement of Residents from Houses	– The number of households/residents (property owners and tenants) to be displaced (i.e., forced relocation) by the project itself regardless of whether their property has been purchased or not	– There are no households/residents within the Walker Industries Niagara Campus boundary. No displacement (i.e., forced relocation) required.	– None warranted.	– No displacement (i.e., forced relocation) required. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
		– The potential for or likelihood of voluntary out migration of residents for consideration of the indirect effects on community character and cohesion	– Continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project is not likely to result in a material change in public attitudes towards the South Landfill (Phase 2) Project and potentially motivate some people to out-migrate voluntarily.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Residents are not expected to be motivated to out-migrate voluntarily. **NO NET EFFECTS**
	Disruption to use and enjoyment of residential properties	– The number of existing residential households and/or future households that are located at specific receptor locations and potentially affected by noise, dust, odour, traffic, agricultural and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls	– Continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project is not likely to be a major additional source of noise, dust, odour, traffic, agricultural and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls that might result in disruption to the use and enjoyment of residential property.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Disruption to use and enjoyment of residential property is not anticipated. **NO NET EFFECTS**
		– The number of existing residential households fronting/backing onto a haul route and potentially affected by changes in project related traffic and traffic noise	– Leachate will not be transported off-site via trucks. Therefore, no changes in traffic or traffic noise are anticipated.	– None warranted.	– No changes in traffic or traffic noise are anticipated. **NO NET EFFECTS**
		– Potential for or likelihood of changes in peoples' use of residential property	– Continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project is not likely to be a major additional source of noise, dust, odour, traffic, agricultural and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls that might result in disruption to the use and enjoyment of residential property.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls	– No changes to peoples' use of residential property are anticipated. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				• Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	
	Disruption to use and enjoyment of public facilities and institutions	– The number of existing public facilities and institutions that may be affected by nuisance factors such as noise, dust, odour, traffic and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls	– Leachate will not be transported off-site via trucks. Therefore, no changes in traffic or traffic noise are anticipated.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in disruption to four public facilities and institutions nearby the Niagara Campus along Thorold Townline Road. **NO NET EFFECTS**
		– Potential for or likelihood of changes in operations of public facilities and institutions	– Development of an on-site wastewater treatment plant will not result in a material change in the capacity of the existing Niagara-on-the-Lake sanitary sewer system and the Region of Niagara's Port Weller Wastewater Treatment Plant.	– None Warranted	– Development of an on-site wastewater treatment plant will not result in a material change in the capacity of the existing Niagara-on-the-Lake sanitary sewer system and the Region of Niagara's Port Weller Wastewater Treatment Plant. **NO NET EFFECTS**
		– Potential for or likelihood of changes in use and enjoyment of public facilities and institutions	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four public facilities and institutions north and west of the Niagara Campus nearest to proposed additional leachate pond.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four public facilities and institutions north and west of the Niagara Campus nearest to proposed additional leachate pond. **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				towards the South Landfill (Phase 2) Project.	
	Loss/disruption of recreational resources	– The number/nature of existing recreational resources and/or future features potentially affected by noise, dust, odour, visual effects and changes in project-related traffic; and the potential for and likelihood of changes in the presence of vermin and gulls	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond. **NO NET EFFECTS**
		– Potential for or likelihood of changes in operations of recreational features	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the operations at four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the operations at four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond. **NO NET EFFECTS**
		– Potential for or likelihood of changes in use and enjoyment of recreational resources	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls	– Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls from the continued use of the municipal wastewater treatment system (with an additional on-site leachate pond) for South Landfill (Phase 2) Project are not expected to be of sufficient magnitude to result in changes in the use and enjoyment of the four recreation resources north and west of the Niagara Campus nearest the proposed additional leachate pond **NO NET EFFECTS**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
				• Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	
	Changes to community character	– Compatibility of landfill operations with the existing and likely future character of the community	– Continued use of existing municipal wastewater treatment system is compatible with the existing and likely future character of the community for the following reasons: • Leachate treatment ponds have operated at the Niagara Campus since the 1980's and are not considered new or unfamiliar to community members. Option A represents a continuation of an existing industrial activity on the Niagara Campus. • An additional leachate treatment pond is not expected to substantially affect features that support community character, nor to substantially affect features or issues that are negative influences on community character.	– None warranted.	– Continued use of existing municipal wastewater treatment system is compatible with the existing and likely future character of the community. **NO NET EFFECTS**
		– Compatibility of the proposed end use with the existing and likely future character of the community	– Continued use of existing municipal wastewater treatment system does not affect the proposed agriculture end use and is therefore compatible with the existing and likely future character of the community.	– None warranted.	– Continued use of existing municipal wastewater treatment system does not affect the proposed agriculture end use and is therefore compatible with the existing and likely future character of the community. **NO NET EFFECTS**
	Changes to community cohesion	– The extent of displacement	– Continued use of existing municipal wastewater treatment system does not required any displacement (i.e., forced relocation).	– None warranted.	– Adverse effects on community cohesion are not likely because no displacement (i.e., forced relocation) is required. **NO NET EFFECTS**
		– The potential for or likelihood of voluntary out migration	– Adverse effects on community cohesion are not likely for the following reasons: • Very few LSA residents are expected to be motivated to out-migrate voluntarily. • Those who might out-migrate voluntarily are likely to be replaced by others who would contribute to community cohesion in their own ways.	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to: • The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	– Adverse effects on community cohesion are not likely because very few LSA residents are expected to be motivated to out-migrate voluntarily. **NO NET EFFECTS**
		– Loss and the extent of disruption of recreational resources, public facilities and institutions, and the use and enjoyment of residential properties	– Adverse effects on community cohesion are not anticipated because no community features that contribute to community cohesion will be displaced. – Changes in leachate treatment related noise, dust, odour, traffic, agricultural and visual effects; and the presence of vermin and gulls are not expected to be	– Walker Environmental Group will manage the South Landfill (Phase 2) in a similar manner as the South Landfill (Phase 1) with respect to:	– Adverse effects on community cohesion are not likely because no community features that contribute to community cohesion will be displaced and nuisance effects are not expected to be of sufficient

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
			of sufficient magnitude, duration or frequency to result in a change in operations at nearby recreational resources, public facilities or institutions, nor the use and enjoyment of residential properties.	• The application of best industry design and management practices to mitigate adverse effects from noise, dust, odour, traffic, agricultural and visual effects; and from the presence of vermin and gulls • Maintenance of regulatory compliance with respect to noise, air quality (i.e., dust and odour); and • Continued neighbour/community engagement and complaint resolution such that there are not likely to be material change in public attitudes towards the South Landfill (Phase 2) Project.	magnitude to change their operations, nor the use and enjoyment of residential properties. **NO NET EFFECTS**
Economic Environment					
Economic Environment	Effect on local economy	– Impact on businesses • Disruption/displacement of businesses (including tourism and farms) • Business opportunities	– No businesses or farms are anticipated to be displaced/disrupted by development of on-site wastewater treatment plant. – Business opportunities associated with construction of on-site wastewater treatment plant through contracting and service providers.	– No mitigation measures required	– No business or farm displacement, and no disruption. Business opportunities related to construction of on-site wastewater treatment plant through contracting and service providers. **LOW (POSITIVE) EFFECT**
		– Labour market impacts • Impact on direct, indirect, and induced employment	– Employment generated during construction of on-site wastewater treatment plant, encompassing direct, indirect, and induced jobs.	– No mitigation measures required	– Employment generated during construction of on-site wastewater treatment plant encompassing direct, indirect, and induced jobs. **MODERATE (POSITIVE) EFFECT**
		– GDP impacts • Impact on direct, indirect, and induced GDP • Retention of economic benefits within local economy	– GDP generated during construction of on-site wastewater treatment plant, encompassing direct, indirect, and induced economic activity. – Economic activity is expected to be largely retained within the local and regional economy.	– No mitigation measures required	– GDP generated during construction of on-site wastewater treatment plant, encompassing direct, indirect, and induced economic activity, with benefits largely retained within the local and regional economy. **MODERATE (POSITIVE) EFFECT**
	Effect on real estate	– Property value impacts	– No effect	– No mitigation measures required	– There will be no effect on property values. **NO EFFECT**
	Effect on public finance	– Impact on municipal revenue	– Loss of annual revenue generated by the Town of Niagara-on-the-Lake through a volumetric charge to Walker for the discharge of leachate originating from East Landfill and South Landfill to the sanitary sewer system. – Increase in property tax revenue payable the City of Niagara Falls and the Region of Niagara due to higher assessed value of the Walker property following development of the on-site wastewater treatment plant.	– No mitigation measures required	– Loss of annual municipal revenue generated through volumetric charges to Walker for leachate originating from East Landfill and South Landfill discharged to the sanitary sewer system. **LOW EFFECT**
		– Impacts on municipal cost	– No cost incurred by the Town of Niagara-on-the-Lake, paid to the Region of Niagara, for the conveyance and treatment of leachate originating from Walker's East Landfill and South Landfill at the Port Weller Wastewater Treatment Plant.	– No mitigation measures required	– No municipal cost incurred for conveyance and treatment of leachate originating from Walker's East Landfill and South Landfill. **LOW (POSITIVE) EFFECT**
		– Impact on assessment base	– Assessment value for Walker property in the City of Niagara Falls increases with development of on-site wastewater treatment plant.	– No mitigation measures required	– Development of the on-site wastewater treatment plant may increase the assessed value of the Walker property. **LOW (POSITIVE) EFFECT**

Evaluation Criteria		Indicators	Potential Effects	Impact Management Measures	Net Effects
	Cost of services	– Impact on customer cost of waste services	– Development of a new on-site wastewater treatment plant will involve substantial capital costs (estimated at $30–$50 million) and significantly higher operating expenses compared to current arrangements. These costs are expected to be recovered through increased tipping fees, resulting in a higher customer cost of service.	– No mitigation measures required	– Tipping fees are expected to increase significantly resulting in a higher customer cost of waste services. **MODERATE EFFECT**
Cultural Environment					
Cultural Heritage Resources	Effect on known or potential built heritage resources and cultural heritage landscapes	– Number of known and potential built heritage resources and cultural heritage landscapes displaced or disrupted	– No effect	– Not applicable	**NO NET EFFECTS**
	Effect on archaeological resources and areas of archaeological potential	– Area (ha) of archaeological potential (i.e., areas with the likelihood to contain archaeological resources)	– Including effects of the Landfill Configuration Options, potential adverse effects on an additional 0.28 ha of area with archaeological potential that may contain previously unidentified archaeological resources with cultural heritage value or interest.	– Conduct a Stage 2 archaeological assessment within all affected areas of archaeological potential in order to identify any archaeological resources that may be present in advance of any adverse effects. Any archaeological resources identified may require further work depending on their cultural heritage value or interest.	– Areas of archaeological potential will be addressed prior to potential adverse effects to determine appropriate mitigation measures for any archaeological resources with cultural heritage value or interest. **NO NET EFFECTS**
		– Number and type of archaeological sites affected	– Including effects of the Landfill Configuration Options, potential adverse effects on previously unknown archaeological sites within areas of archaeological potential.	– Any archaeological resources identified during a Stage 2 archaeological survey with cultural heritage value or interest will be subject to a Stage 3 site-specific assessment and Stage 4 mitigation of development impacts where necessary.	– Potential adverse effects to potential archaeological resources with cultural heritage value or interest would be mitigated either through avoidance and protection or further excavation. **NO NET EFFECTS**