

LEACHATE MANAGEMENT OPTIONS - METHODOLOGY

- Based on existing leachate management and treatment being provided at other disposal sites, and the current regulatory approvals requirements, it is expected to be possible to construct an on-Site leachate treatment plant that will achieve a high quality effluent to allow discharge into the local surface water system. On-Site leachate treatment technologies were screened and a preferred on-Site treatment option was selected based on demonstrated performance and cost-effectiveness.
- Off-Site leachate receiver/treatment alternatives were evaluated and alternatives to convey leachate to available off-Site leachate treatment alternatives considered.
- A comparison of the preferred on-Site leachate treatment technology to a viable off-Site treatment alternative was completed as per Appendix B of the TOR.

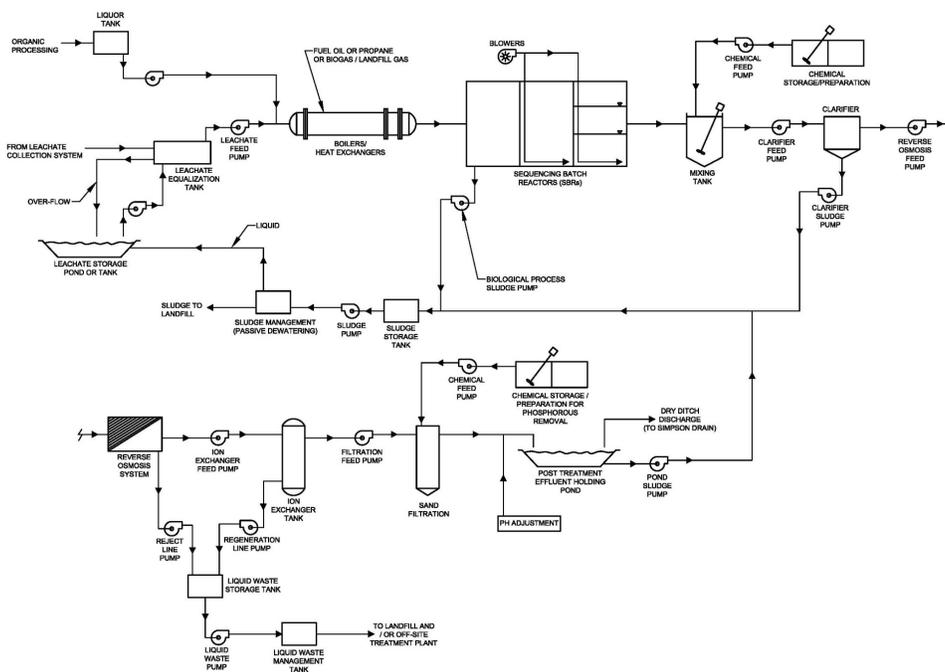
LEACHATE CONSIDERATIONS

- Leachate is the liquid that is produced as precipitation enters the waste and dissolves constituents from the waste as it passes through it. The CRRRC landfill will have a leachate collection system designed as per the Ontario Regulation 232/98 requirements.
- Both the landfill leachate quality and quantity will vary with time during the operation and post-closure time periods of the landfill.
- The organics processing facility will also generate liquor requiring collection and co-treatment with leachate.

ON-SITE LEACHATE MANAGEMENT

- A review of options showed that collected leachate would best be treated by chemical, biological, membrane and sand filtration and sorption processes such that the treated leachate meets the Provincial Water Quality Objectives, which are designed to protect all forms of aquatic life.
- Treated leachate would be discharged to a surface water course; the Simpson Drain would be the proposed receiver.

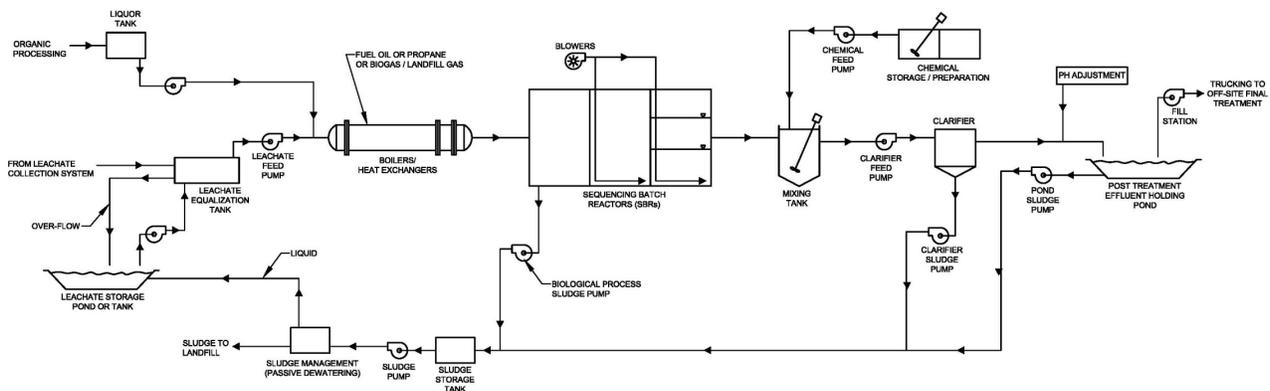
On-Site Leachate Treatment Process Schematic



OFF-SITE LEACHATE MANAGEMENT

- A review of potential options determined that off-Site final treatment via the City of Ottawa Wastewater Treatment Facility was available.
- Through available information and consultation with the City, Taggart Miller concluded that it is a reasonable alternative for Taggart Miller to use the City's facility to accept leachate from the CRRRC for treatment provided wastewater is compliant with Sewer Use By-Law limits and an agreement is in place.
- This alternative would involve pre-treatment of leachate with the off-Site final treatment via the City of Ottawa wastewater treatment plant.
- The leachate would be transferred to the City wastewater treatment plant via tanker trucks until such time as a forcemain option is available.
- The preferred method of pre-treatment of the collected leachate is by chemical and biological processes.

Off-Site Leachate Pre-treatment Process Schematic



COMPARISON OF LEACHATE MANAGEMENT OPTIONS

- Environmental components considered in the comparison included:

| | |
|-----------------------------|--------------------------|
| Atmosphere | Geology & Hydrogeology |
| Surface Water | Biology |
| Land Use | Traffic |
| Technical Effectiveness | Regulatory Approvability |
| Capital and Operating Costs | |

- The criteria and indicators for comparison are those in Appendix B of the approved TOR.



COMPARISON OF LEACHATE MANAGEMENT OPTIONS

| Environmental Criteria | On-Site Leachate Treatment and Discharge to Simpson Drain | On-Site Leachate Pre-Treatment and Off-Site Leachate Management at City of Ottawa Wastewater Treatment Facility |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Atmosphere – Odour | Ranked 2nd because: Treatment operations would have a greater number of more complex processes, hence potential odour generation is greater. | Ranked 1st because: Pre-treatment operations would have less complex processes, hence potential odour generation is less. |
| Atmosphere – Air Quality | Ranked 2nd because: Treatment operations would have a greater number of more complex processes, hence potential air quality impacts are greater. | Ranked 1st because: Pre-treatment operations would have less complex processes, hence potential air quality impacts are less. |
| Atmosphere – Noise | Ranked 2nd because: This option has more equipment and hence the potential to generate more noise. | Ranked 1st because: This option has less equipment and hence would generate less noise. |
| Geology and Hydrogeology – Groundwater Quality | Ranked 1st (tied) because: No predicted effect on off-Site groundwater quality. | Ranked 1st (tied) because: No predicted effect on off-Site groundwater quality. |
| Surface Water – Surface Water Quality | Ranked 2nd because: Although this option is designed to meet the Provincial Water Quality Objectives within the receiving surface water course, there will still be a discharge to manage and monitor and some parameter concentrations will increase from the baseline conditions. Limited flow in the receiving surface water course to provide a mixing zone. | Ranked 1st because: No predicted effect on off-Site surface water quality. The City of Ottawa plant is required to meet Provincial Water Quality Objectives within the receiving surface water body for the City of Ottawa wastewater treatment plant. |
| Surface Water – Surface Water Quantity | Ranked 1st (tied) because: This option would discharge to the Simpson Drain. The discharge quantity will be controlled and will contribute only a small amount of the total flow. | Ranked 1st (tied) because: This option would discharge to the Ottawa River and will have negligible effect. |
| Biology – Aquatic Biological Resources | Ranked 2nd because: Although this option is designed to meet the Provincial Water Quality Objectives within the receiving surface water course, there will still be a discharge to manage and monitor and some parameter concentrations will increase from the baseline conditions. | Ranked 1st because: This option does not influence aquatic biological resources on or in the area of the Site and treatment of CRRRC leachate by the City plant would not have any meaningful effect on aquatic resources at that location. |



COMPARISON OF LEACHATE MANAGEMENT OPTIONS (continued)

| Environmental Criteria | On-Site Leachate Treatment and Discharge to Simpson Drain | On-Site Leachate Pre-Treatment and Off-Site Leachate Management at City of Ottawa Treatment Facility |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Biology – Terrestrial Biological Resources | Ranked 1st (tied) because: No basis to distinguish the two options for this criteria as area in which facility will be located will be disturbed in any event. | Ranked 1st (tied) because: No basis to distinguish the two options for this criteria as area in which facility will be located will be disturbed in any event. |
| Land Use | Ranked 1st (tied) because: No predicted impact on off-Site existing or probable planned future land use. | Ranked 1st (tied) because: No predicted impact on off-Site existing or probable planned future land use. |
| Traffic | Ranked 1st because: This option does not have trucks hauling leachate. | Ranked 2nd because: This option has trucks hauling leachate, which will generate additional Site-related traffic. |
| Technical Effectiveness | Ranked 2nd because: Full treatment required to meet the Provincial Water Quality Objectives. Less flexible to variations in leachate quality. | Ranked 1st because: Leachate can be readily treated to meet Sewer Use By-law limits. Not expected to adversely affect operation or performance of City of Ottawa wastewater treatment plant. |
| Regulatory Approvability | Ranked 2nd because: This type of treatment system has been approved for the treatment of wastewater in the province of Ontario, and has generally performed acceptably. However it will require greater regulatory scrutiny. | Ranked 1st because: Leachate pre-treatment system readily approved. City treatment system already approved. |
| Capital and Operating Costs | Ranked 2nd because: Higher capital cost compared to the other option. Higher operational requirements and costs. Monitoring of discharge quality is required. | Ranked 1st because: Lower capital cost compared to the other option. Lower operational requirements and costs. Monitoring of discharge quality is required. |
| OVERALL RANKING | 2nd | 1st |

The preferred leachate management option is on-Site pre-treatment and trucking to the City treatment facility. If the City of Ottawa option proves not to be available, the on-Site option described above will be pursued.



- In the approved TOR, Taggart Miller proposed to undertake an assessment of the potential cumulative effects of the CRRRC project and other known or probable future planned activities near the Site.
- Cumulative effects consider when one project effect is likely to act in a cumulative fashion with the effects of other existing or reasonably foreseeable projects or activities.
- The existing zoning was considered in determining the area for this assessment:
 - Immediately north: Highway 417 corridor
 - Immediately to the west: zoned rural heavy industrial, with limited existing residential
 - Further west and to the south, southwest and northeast: zoned rural and largely undeveloped
 - Further southwest and south, and to the southeast and east: zoned agricultural
 - Northwest of the Boundary Rd./417 interchange: natural environment designation
 - North of 417: golf course
- The rural lands are largely undeveloped with limited potential for future development; agricultural lands are used for farming purposes and expected to remain so; the industrial park is partially developed with little activity.
- Only one known proposed new facility southeast of Boundary Road/Highway 417 to de-couple double tractor trailers to single trailers for travel to sites within the City.
- Assumed that the off-Site activities operate and perform in compliance with relevant standards and requirements.
- Environmental components considered for the cumulative effects assessment were:
 - Atmosphere;
 - Geology and Hydrogeology;
 - Surface Water;
 - Biology;
 - Land Use & Socio-economic;
 - Agriculture; and
 - Traffic.



| Environmental Component | Assessment Criteria | Potential Effects of CRRRC Project | Potential Cumulative Effects | Mitigation by CRRRC | Potential Residual Cumulative Effects |
|-------------------------|----------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Atmosphere | Odour | Odour | Odour from other sources combines with CRRRC odours | Implement the CRRRC proposed odour mitigation measures | No significant residual cumulative effects likely given proposed CRRRC mitigation and requirement of other projects and activities to comply with MOE standards and requirements |
| | Dust | Dust emissions | Dust associated with existing soil processing and stockpiling, and agricultural practices combines with CRRRC-related dust | Implement the CRRRC proposed dust mitigation measures | No significant residual cumulative effects likely given proposed CRRRC mitigation and requirement of other projects and activities to comply with MOE standards and requirements |
| | Air Quality | Regulated compound emissions | Air emissions from other projects and activities combines with CRRRC air emissions | Implement the CRRRC proposed air quality mitigation measures | No significant residual cumulative effects likely given proposed CRRRC mitigation and requirement of other projects and activities to comply with MOE standards and requirements |
| | Noise | Noise emissions | Noise emissions from other projects and activities combines with CRRRC noise emissions | Implement the CRRRC proposed noise mitigation measures | No significant residual cumulative effects likely given proposed CRRRC mitigation and requirement of other projects and activities to comply with MOE standards and requirements |
| Hydrogeology | Groundwater quality | Groundwater quality impacts | Groundwater quality impacts from other projects and activities combines with CRRRC groundwater quality impacts | Design and operate CRRRC to meet relevant provincial guidelines and standards regarding groundwater quality protection within property boundary | No significant residual cumulative effects likely given proposed CRRRC mitigation and requirement of other projects and activities to comply with MOE standards and requirements |
| | Groundwater quantity | Groundwater quantity impacts | Groundwater quantity impacts from other projects and activities combines with CRRRC groundwater quantity impacts | None required | No cumulative effect anticipated |

| Environmental Component | Assessment Criteria | Potential Effects of CRRRC Project | Potential Cumulative Effects | Mitigation by CRRRC | Potential Residual Cumulative Effects |
|-------------------------|----------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surface Water | Surface water quality | Surface water quality impacts | Surface water quality impacts from other projects and activities combines with CRRRC surface water quality impacts | Design and operate CRRRC to meet relevant provincial guidelines and standards regarding surface water quality | No significant residual cumulative effects likely given proposed CRRRC mitigation and requirement of other projects and activities to comply with MOE standards and requirements |
| | Surface water quantity | Surface water quantity impacts | Surface water quantity impacts from other projects and activities combines with CRRRC surface water quantity impacts | Controlled rate of release to surface water receivers by CRRRC stormwater management system | No cumulative effect anticipated |
| Biology | Aquatic biological resources | Change in habitat as a result of moving ditches | Any aquatic biological impacts from CRRRC unlikely to overlap in time, space and nature of effect with other sources | Restore and enhance habitat as appropriate | No cumulative effect anticipated |
| | Terrestrial biological resources | Removal of vegetation and disruption to wildlife | Any terrestrial biological impacts from CRRRC unlikely to overlap in time, space and nature of effect with other sources | Restore and enhance remaining habitat as appropriate | No cumulative effect anticipated |

| Environmental Component | Assessment Criteria | Potential Effects of CRRRC Project | Potential Cumulative Effects | Mitigation by CRRRC | Potential Residual Cumulative Effects |
|--------------------------------------|---------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Land Use & Socio-economic | Land Use | Nuisance effects on off-Site land uses | Cumulative nuisance related effects from other projects and activities and CRRRC | Implement the CRRRC proposed dust, air quality and noise design and operations mitigation measures to ensure compliance with MOE standards | No significant residual cumulative effects likely given proposed CRRRC mitigation and requirement of other projects and activities to comply with MOE standards and requirements |
| | Socio-economic | Increased local direct spending and employment | Combined economic activity may lead to additional east end Ottawa jobs and investment | None | Positive effect anticipated |
| | Visual | CRRRC may be visible from certain vantages | Any visual impacts from the CRRRC unlikely to interact cumulatively in same viewshed with other projects and activities | Implement screening of CRRRC where required | Significant cumulative visual impact unlikely |
| Agriculture | | No material effects identified | None | Implement the CRRRC proposed dust, air quality and noise design and operations mitigation measures to ensure compliance with MOE standards | No cumulative effect anticipated |
| Traffic | | Increased traffic | <ul style="list-style-type: none"> ➢ Existing projects and activities already taken in CRRRC traffic assessment ➢ The increased traffic associated with any future project other than the CRRRC will be required to individually address traffic-related matters. | Provision of Boundary Road improvements at the site access location, including an exclusive left turn lane on southbound Boundary Road | With mitigation planned for CRRRC and required for any future projects with traffic impacts, no significant cumulative effect anticipated |

Based on the cumulative effects assessment none of the potential residual cumulative effects were determined to be significant.



Additional Information – Please visit the front desk for a hand-out containing the following information:

- An outline of the proposed Environmental Assessment/Environmental Protection Act document package;
- An overview of the proposed schedule for submissions;
- An overview of the Ministry of the Environment decision-making process; and
- The plans regarding distribution of the Draft Environmental Assessment Report for review.

Following this Open House #5, Taggart Miller will be:

- Completing the draft reports for the Environmental Assessment; and
- Hosting Open House #6 to present the Draft Environmental Assessment Report. Open House #6 is tentatively scheduled for winter/spring 2014.

There are many opportunities for you to get involved and provide your views.

- Complete the comments sheet provided at this Open House #5.
- Request a meeting and/or additional information.
- Visit our website **CRRC.ca** to obtain information and provide comments.

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