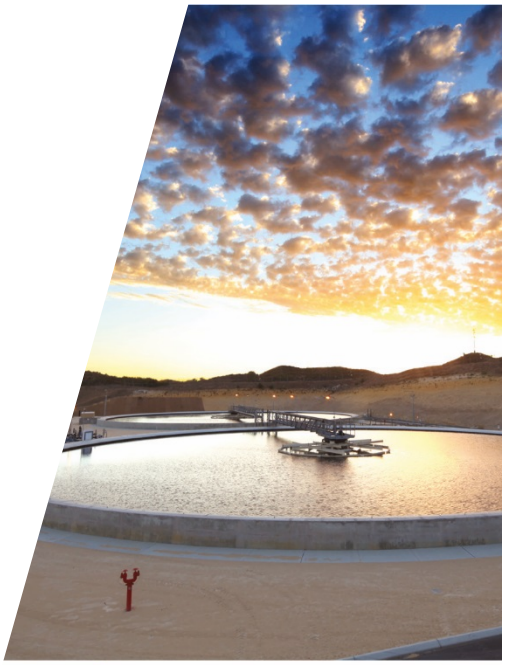
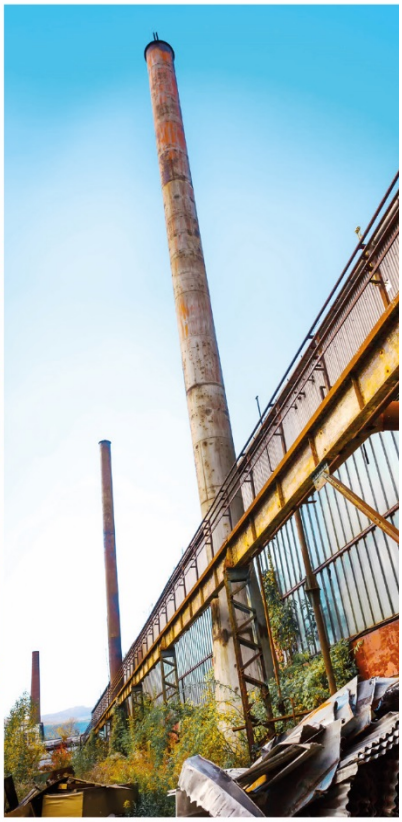


2018 Quarterly Site Inspections

Clean Harbors Lambton Facility
4090 Telfer Road, Corunna, Ontario



Clean Harbors Canada, Inc.

Executive Summary

In accordance with requirements outlined in Section 8.1 of the Design and Operations Report and Environmental Compliance Approval No. A031806, GHD conducted quarterly Site Inspections of the Clean Harbors Canada, Inc. (Clean Harbors) Lambton Facility (Site) in Corunna, Ontario. The individual inspection reports are provided in Appendices A through D for review.

Appendix Index

- Appendix A: 2018 First Quarter Site Inspection
- Appendix B: 2018 Second Quarter Site Inspection
- Appendix C: 2018 Third Quarter Site Inspection
- Appendix D: 2018 Fourth Quarter Site Inspection

Appendices

Appendix A
2018 First Quarter Site Inspection

Memorandum

April 24, 2018

To:	Erica Carabott/Clean Harbors Mike Parker/Clean Harbors	Ref. No.:	044985
From:	Jim Yardley/Neil Shannick/mg/40	Tel:	519-884-0510

Subject: **2018 First Quarter Site Inspection**

1. Introduction

In accordance with requirements outlined in Section 8.1 of the Design and Operations Report, GHD conducted the 2018 first quarter Site Inspection (Inspection) of the Clean Harbors Canada, Inc. (Clean Harbors) Lambton Facility (Site) in Corunna, Ontario. The Inspection was conducted on March 21, 2018 by Neil Shannick.

The Inspection consisted of a walk around the Site. The Inspection focused primarily on the active landfill and waste disposal operations, including an inspection of each of the surface water, leachate, and process water ponds.

1.1 Weather and Site Conditions

At the time of the Inspection, the temperature was -1°C. Weather conditions at the Site were overcast and windy, with wind blowing from north to south. During the week preceding the Inspection, the Site experienced 0.0 mm of total precipitation, and a mean temperature of -2.4°C. During the Inspection, the Site was generally dry to damp, with minimal/isolated snow piles/drafts in small areas throughout the Site. Ponding was noted in low, flat areas and very high water levels were noted in several ditches. Figure 1 provides a Site plan showing features referenced herein, as well as any notes related to specific issues noted in this memorandum. Figure 2 provides the Landfill Expansion Subcell Fill Progression Plan, identifying the cell locations, as presented in the "*Design and Operations Report - Lambton Landfill Expansion, Clean Harbors Canada, Inc.*", as prepared by Tetra Tech WEI Inc., dated October 8, 2015.

2. Landfill Operations

The Inspection was focused on landfill and waste disposal operations including Cell development, active disposal, waste hauling, and landfill capping efforts.

2.1 Landfill Cell Development

The following provides a description of the status of the Landfill Cell Development, including active waste disposal operations and internal waste transport routes:

- The active waste tipping face is located in the southern portion of Cell 19-1-3 and is referred to as 19-1-3C. Waste placement is occurring from south to north, as shown in Photo 1. The southern portion of Cell 19-1-2 is no longer active. Odour was noted in the immediate vicinity of the active landfilling area.
- Construction of the southern half of Cell 19-1-3 has been completed. The northern portion is not currently under construction.
- Waste Transport Route: Site waste haulers are directed around the east side of the Process Area and enter Cell 19-1-3C from the east side, located at the north end of the constructed cell, on a dedicated haul road from the Waste Receiving Area.

2.2 Landfill Cap

The following provides a description of the status of the Landfill Cap, including cap placement during the first quarter, and the condition of the interim and final cap. With the recent approval of the vertical expansion, the previous capped areas are considered to be interim, since a portion of the cap will be removed and additional waste placed in these areas.

2.2.1 Interim and Final Cap Placement in Quarter

- The majority of the Site has received an interim cap, with the exception of the active landfilling area (Cell 19-1-3C).
- Cells 19-1-1 and 19-1-2A have received interim cap.
- Cells 19-1-2B and 19-1-2C have received daily cover, with miscellaneous debris noted in the cover. The daily cover of Cells 19-1-2B and 19-1-2C is shown in Photo 2.

2.2.2 Interim Cap Conditions

- The interim cap was noted to be in good condition, with minor erosion channels observed.
- Interim cover material is available for placement on Cells 19-1-2B and 19-1-2C, currently stockpiled on Cell 19-1-1.
- Minor ponding was identified in several areas as described in Section 4. The interim cap requires minor grading to promote drainage to the perimeter ditches.
- Erosion channels should be addressed through additional clay placement and grading.

2.2.3 Final Cap Conditions

- Per Environmental Compliance Approval No. A031806, Notice No. 9 (dated October 19, 2015), no areas of the Site are considered to have received final capping. Per approval of the landfill expansion, all areas, as noted in Section 2.2.1, are considered to have received interim capping at this time.

- No areas have received topsoil. Natural vegetation is present in the northeast and southern (non-active) portions of the Site.

3. Perimeter Screening Berms

The following provides a description of the status of the Perimeter Screening Berms:

- Significant berm erosion was identified immediately west of proposed Cell 21-1. The erosion occurred on the landfill side of the berm, as identified on Figure 1 (previously identified in quarterly reports).
- Multiple larger erosion channels were identified on the landfill side of the north perimeter screening berm, as identified on Figure 1 (previously identified in quarterly reports).
- Minor erosion channels were noted throughout the Perimeter Screening Berms. These channels are prevalent throughout the un-vegetated internal side walls of the western and eastern perimeter screening berms.
- Several large erosion channels were noted on the elevated areas immediately northwest and southeast of the northern portion of the landfill. The erosion channels are located on plateaus/ramps within the screening berm. The erosion channel in the southeast corner extends into the east perimeter ditch.
- Note that all erosion channels within the Perimeter Screening Berms are on the internal side walls. The external side walls are in good condition and vegetated. As such, erosion channels do not create any issues external to the landfill. The only issue presented by erosion is sedimentation of the perimeter ditches.

4. Surface Water Management System

The following provides a description of the status of the Surface Water Management System, including the ditches, swales, and surface water ponds.

4.1 Ditches and Swales

The following provides a description of the status of the surface water ditches and swales:

- Shallow ponding was identified within the southwest corner of the Original Landfill Area (OLA).
- Water levels were very high within the southern perimeter ditch of the OLA, nearly overtopping in areas. Pumping was not active during the Inspection.
- Shallow ponding was identified within the northwest corner of the OLA (location as shown on Figure 1 and Photo 3). The area has been graded to drain to the north ditch with an internal swale. The internal swale was partially full during the Inspection, with no observed flow.
- Minor ponding was noted in the northwest portion of proposed Cell 21-3 (i.e., located centrally in the northern portion of the Site), as shown in Photo 4. Two drainage paths were identified, both of which were full. No flow was observed.

- Water levels continue to be high in the central portion of the north ditch, as shown in Photo 5. High water levels in the north ditch have the potential to prohibit the above-noted ponded areas from draining during wetter periods.
- There was minimal standing water in the perimeter ditch in the northeast corner of the Site (i.e., at the location of the former perimeter screening berm access road).
- Flow from the north ditch to the eastern ditch is impeded by sedimentation in the northeast corner of the Site, likely brought on by dense wetland vegetation within the ditch and sedimentation, as shown in Photo 6 and Figure 1.
- Sedimentation is occurring in the east ditch as a result of erosion of the perimeter screening berm, along the entire length of the OLA, resulting in fluctuations in grade and flow breaks. Erosion channels range from minor to large. Minimal standing water was noted in the northern half of the east ditch. Low level standing water was observed in the southern half of the ditch.
- Significant erosion was identified in the southeast corner of the OLA, resulting in sedimentation of the perimeter ditch and limited water flow, as shown in Photo 7 and Figure 1. Low levels of standing water were observed in the southeast ditch and the internal swale to the north.
- It was noted during previous Inspections that there was limited elevation difference available within the northeast corner of the perimeter ditch. As such, there is minimal ability to lower the base of ditch and maintain flow to the East Surface Water Pond.
- No water was observed in the east perimeter ditch between the OLA and the empty bin storage area. A slight odour was noted near the empty bin storage area.
- Water levels were low at the culverts beneath the borrow area driveway, extending from the empty bin storage area to the East Surface Water Pond. Erosion was noted on both the upstream (minor) and downstream (major) sides of the borrow area driveway. Sediment buildup remains at the culvert inlets and outlets.
- There is a flow break in the south ditch, beneath the access bridge located at Gate 6. The blockage is the result of wildlife activity (i.e., beavers), as shown in Photo 8. Flow was noted through the dam, due to high water levels overtopping the dam. During a previous inspection, it was noted that removed beaver was caught and removed from the Site; however, it appears as though another beaver has arrived at Site.
- High water levels were identified in the western portion of the south ditch, with minimal flow noted. Previous inspections identified significant sedimentation and accumulation of loose vegetation in the southwest corner of the perimeter ditch, impeding flow of water toward the West Surface Water Pond. Flow was noted overtopping the blockage during the Inspection, due to high water levels in the ditch. A clear picture of the blockage could not be obtained due to dense vegetation.

4.2 East Surface Water Pond

The following provides a description of the status of the East Surface Water Pond (Photo 9):

- Water levels within the East Surface Water Pond were moderate. The pond was covered with ice.

- Little to no flow was observed entering the East Surface Water Pond.
- The pump at the East Surface Water Pond was in operation at the time of Inspection.

4.3 West Surface Water Pond

The following provides a description of the status of the West Surface Water Pond (Photo 10):

- Water levels within the West Surface Water Pond were moderate. The pond was covered with ice.
- Minimal flow was observed entering the West Surface Water Pond.
- The pump at the West Surface Water Pond was in operation at the time of Inspection.

4.4 Equalization Pond

The following provides a description of the status of the Equalization Pond (Photo 11):

- Water levels within the Equalization Pond were moderate to high. Flow was not observed entering the Equalization Pond at the time of Inspection.
- Minor cracking and sloughing of the concrete side walls of the Equalization Pond was observed during the Inspection. Additional sloughing was noted in several areas around the perimeter.
- Fish and minnows were not observed within the Equalization Pond.

5. Process Water Management System

The Process Water Management System consists of three ponds and a series of ditches and swales. The North Process Water Pond is located immediately west of the TDU area, the South Process Water Pond is located immediately south of the Incinerator, and the West Process Water Pond is located adjacent to the West Surface Water Pond. Water retained in the Process Water Management System is used as quench water for Site incineration operations.

5.1 Process Water Ditches and Swales

The following provides a description of the status of the process water ditches and swales:

- The process water ditch adjacent to the TDU area exhibited a moderate water level at the time of Inspection. This ditch was not being pumped at the time of Inspection. Significant erosion channels immediately to the west, along the Landfill Container Compound access road, have been repaired, though channels remain on the road shoulder.
- The ditches feeding the North Process Water Pond had moderate to high levels of standing water at the time of Inspection. As shown in Photo 12, these ditches have significant sediment buildup in the rip rap and culverts, with little to no potential for flow toward the pond. The ditches were also partially covered with ice. It is recommended that sediment be removed from the ditches, including the ditch in front of the HHW Depot.

- It was also noted that the west end of the culvert beneath the North Process Water Pond access driveway is partially crushed. Repair and culvert cleaning should be evaluated during repairs to the ditch as recommended above.
- No standing water was noted in several small ditches near the South Process Water Pond.

5.2 North Process Water Pond

The following provides a description of the status of the North Process Water Pond (Photo 13):

- The water level within the North Process Water Pond was very low, well below the ditch inlet and culvert outlets.
- The pump at the North Process Water Pond was running at the time of the Inspection.
- A significant washout remains in the southeast corner of the North Process Water Pond. Some large rip rap has been placed in the washout, however, repair of the side slope is necessary.

5.3 South Process Water Pond

The following provides a description of the status of the South Process Water Pond (no photo was taken during the Inspection):

- The water level within the South Process Water Pond was very high.
- It was noted that this area is also receiving runoff from east of the active landfill area. Partial vegetative blockage of this drainage path was identified immediately east of the South Process Water Pond, limiting drainage of the Cell 19-1-3A area.

5.4 West Process Water Pond

The following provides a description of the status of the West Process Water Pond, which is used for process water storage:

- The water level within the West Process Water Pond was very high.

6. Leachate Management System

The leachate reservoirs are designed to receive leachate from the active fill area and process areas. Leachate transferred from the active fill area is detained within the leachate reservoirs prior to transfer to the incinerator for disposal.

6.1 South Leachate Reservoir

The following provides a description of the status of the South Leachate Reservoir (Photo 14):

- The South Leachate Reservoir is equipped with a permanent floating cover. Based on observation of the cover, the Reservoir is not currently being used for leachate storage. During a previous post-Inspection meeting, Clean Harbors indicated that leachate from this pond was pumped into the East Leachate Reservoir in preparation for enlargement of the South Leachate Reservoir.

- Clean Harbors maintains a record of the volume of leachate within the South Leachate Reservoir.

6.2 East Leachate Reservoir

The following provides a description of the status of the East Leachate Reservoir (Photo 15):

- The East Leachate Reservoir is equipped with a permanent floating cover. Based on observation of the cover, the Reservoir is currently being used for leachate storage.
- Clean Harbors maintains a record of the volume of leachate within the East Leachate Reservoir.

6.3 New Leachate Reservoir

The following provides a description of the status of the New Leachate Reservoir (Photo 16):

- The new Leachate Reservoir has been constructed immediately east of the East Leachate Reservoir and is equipped with a permanent floating cover. The new Leachate Reservoir is currently operational and is being used for leachate storage, based on observation of the cover.
- Clean Harbors maintains a record of the volume of leachate within the New Leachate Reservoir.

6.4 Leachate Storage Tank and Pumping System

The following provides a description of the status of the Leachate Storage Tank and Pumping System:

- The Leachate Storage Tank is in operation, serving as the feed tank to the incinerator.

7. Waste Processing Operations

The following provides a description of the Waste Processing Operations:

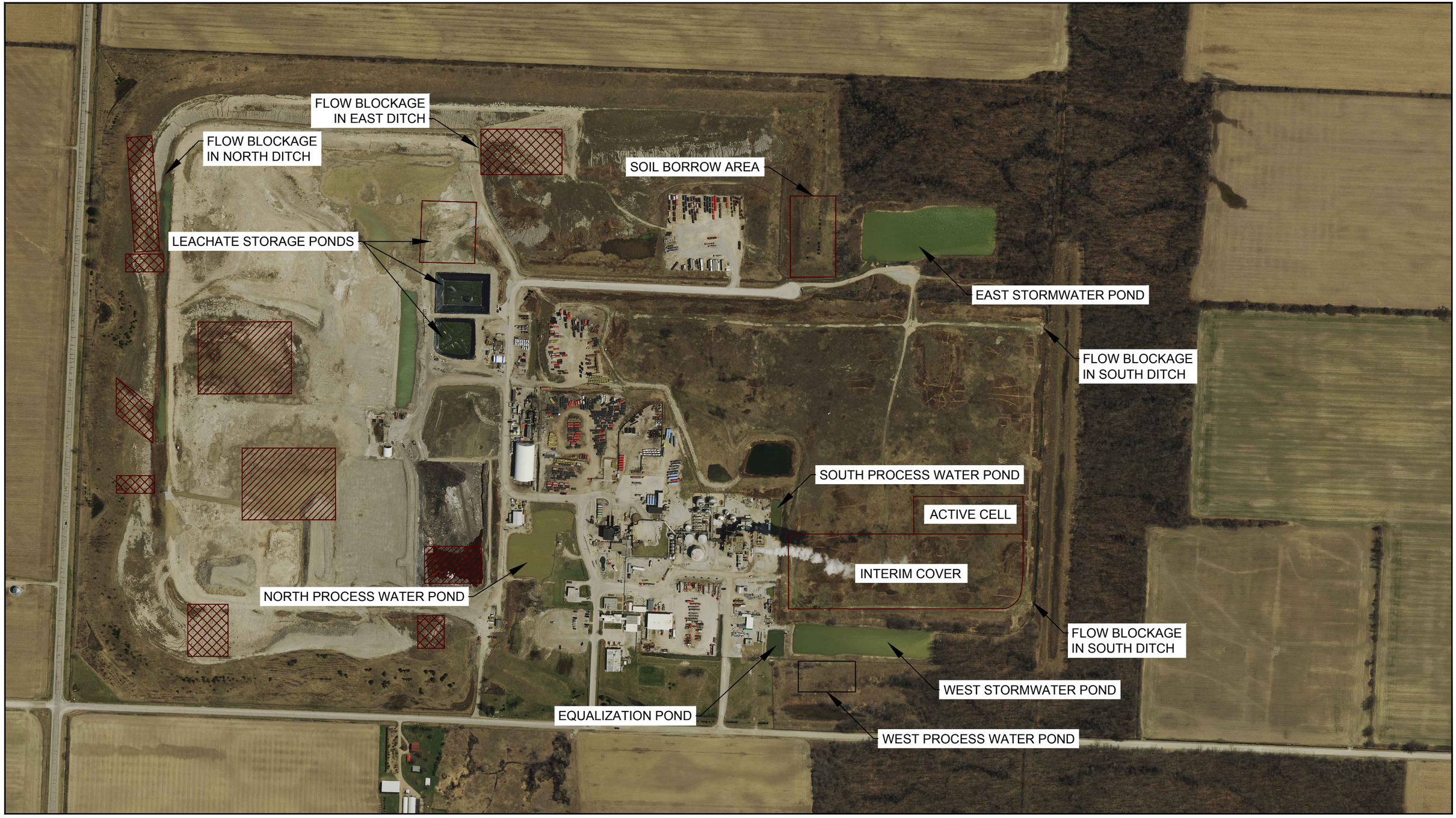
- Odour was noted in the vicinity of active landfilling operations in Cell 19-1-3C, likely originating from the active landfilling area.
- A slight odour was noted within the TDU area.
- A slight odour was noted adjacent to the empty bin storage area.
- Identified odours were localized and were not identified at or beyond Site boundaries.

8. Conclusions and Recommendations

Interim cover work has been completed in the northern area of the Site. As such, the former stockpile area and other areas in the north that have ponded water are scheduled to be assessed and re-graded to promote drainage.

Maintenance of the perimeter ditches is required to remove areas where sediment has accumulated and is restricting flow of water. Maintenance of the perimeter ditches is a key component to minimize ponding of water on the interim cover and transfer of water to surface water ponds. It is recommended that perimeter ditch maintenance be undertaken during the Spring of each year.

Portions of the interior side of the perimeter screening berms have significant erosion. These areas should be assessed and corrected to minimize erosion into the perimeter ditches. Installation of reinforced ditches from the top of berm to the perimeter ditches may be a solution for these areas, as well as vegetation of the internal berm slopes.



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LEGEND:

LARGE EROSION CHANNELS

LARGE AREAS OF SURFACE WATER PONDING

GHD

LAMBTON FACILITY
CLEAN HARBORS CANADA INC.
2018 FIRST QUARTER SITE INSPECTION

SITE PLAN

44985-16

Apr 6, 2018

FIGURE 1

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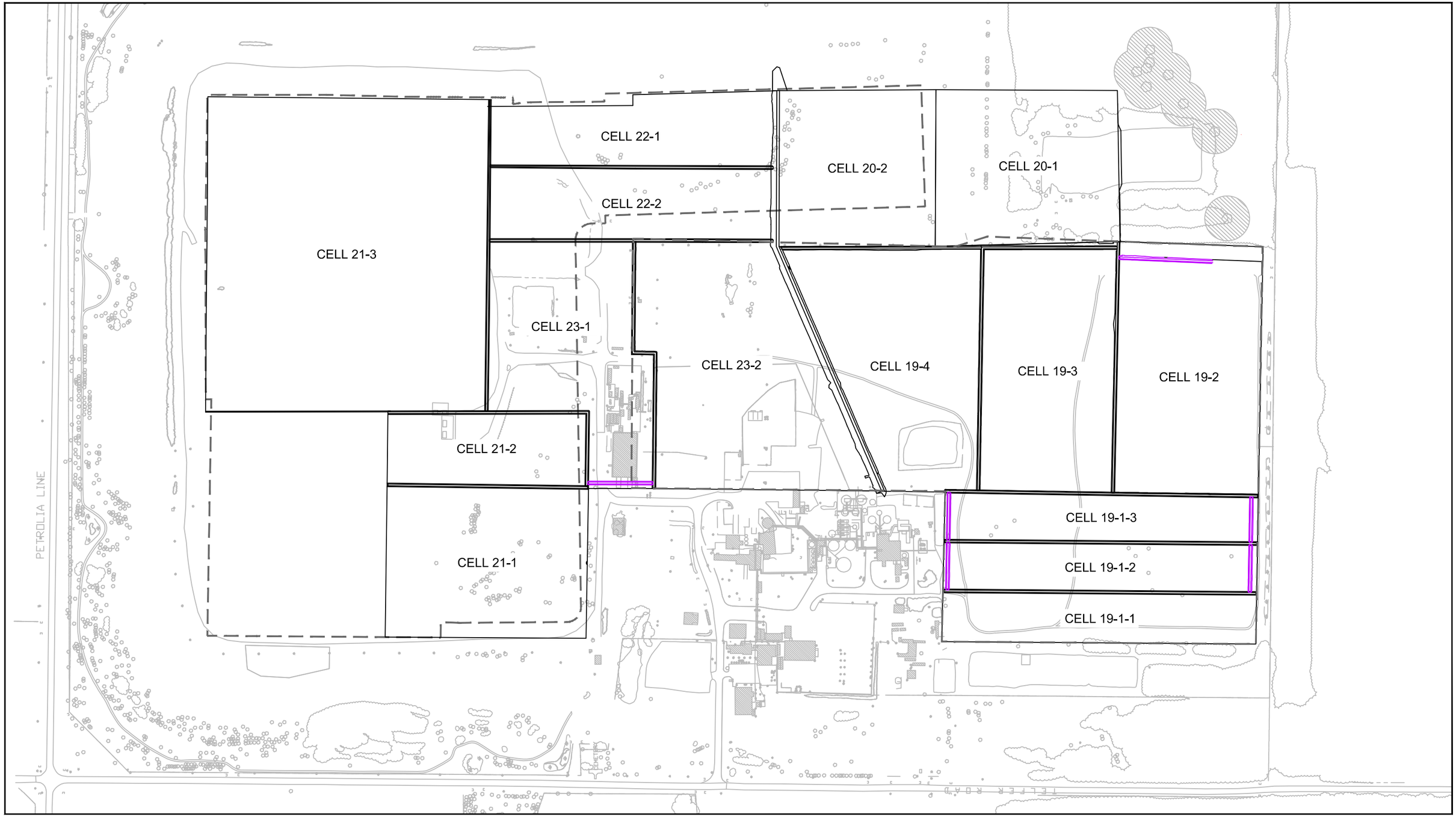

Source: DESIGN AND OPERATIONS REPORT - LAMBTON LANDFILL EXPANSION, CLEAN HARBORS CANADA, INC. PREPARED BY TETRA TECH WEI INC. DATED OCTOBER 8, 2015

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LAMBTON FACILITY
CLEAN HARBORS CANADA INC.
2018 FIRST QUARTER SITE INSPECTION

LANDFILL EXPANSION SUBCELL FILL EXPANSION PLAN

44985-16

Apr 6, 2018

FIGURE 2

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Attachment 1
Photographic Log

Photo 1 - Active landfilling cell (southern portion of Cell 19-1-3)

Photo 2 - Interim cap placement, southern portion of Cell 19-1-2

Photo 3 - Ponding within northwest corner of Site

Photo 4 - Ponding in northern, central portion of Site

Photo 5 - High water levels in central portion of north perimeter ditch

Photo 6 - North ditch, surface water blockage

Photo 7 - North landfill area, southeast ditch, partial surface water blockage

Photo 8 - South ditch, surface water blockage west of access bridge

Photo 9 - East Surface Water Pond

Photo 10 - West Surface Water Pond

Photo 11 - Equalization Pond

Photo 12 - North Process Water Pond ditch

Photo 13 - North Process Water Pond

Photo 14 - South Leachate Reservoir

Photo 15 - East Leachate Reservoir

Photo 16 - New Leachate Reservoir

Appendix B
2018 Second Quarter Site Inspection

Memorandum

June 21, 2018

To:	Erica Carabott/Clean Harbors Mike Parker/Clean Harbors	Ref. No.:	044985
From:	Jim Yardley/Neil Shannick/mg/42	Tel:	519-884-0510

Subject: **2018 Second Quarter Site Inspection**

1. Introduction

In accordance with requirements outlined in Section 8.1 of the Design and Operations Report, GHD conducted the 2018 second quarter Site Inspection (Inspection) of the Clean Harbors Canada, Inc. (Clean Harbors) Lambton Facility (Site) in Corunna, Ontario. The Inspection was conducted on June 4, 2018 by Neil Shannick.

The Inspection consisted of a walk around the Site. The Inspection focused primarily on the active landfill and waste disposal operations, including an inspection of each of the surface water, leachate, and process water ponds.

1.1 Weather and Site Conditions

At the time of the Inspection, the temperature was 15°C. Weather conditions at the Site were overcast and windy, with wind blowing from west to east. During the week preceding the Inspection, the Site experienced 2.2 mm of total precipitation, and a mean temperature of 19.4°C. During the Inspection, the Site was generally dry. Minimal standing water was noted in low, flat areas and water levels were low throughout the Site. Figure 1 provides a Site plan showing features referenced herein, as well as any notes related to specific issues noted in this memorandum. Figure 2 provides the Landfill Expansion Subcell Fill Progression Plan, identifying the cell locations, as presented in the "*Design and Operations Report - Lambton Landfill Expansion, Clean Harbors Canada, Inc.*", as prepared by Tetra Tech WEI Inc., dated October 8, 2015.

2. Landfill Operations

The Inspection was focused on landfill and waste disposal operations including Cell development, active disposal, waste hauling, and landfill capping efforts.

2.1 Landfill Cell Development

The following provides a description of the status of the Landfill Cell Development, including active waste disposal operations and internal waste transport routes:

- The active waste tipping face is located in the central portion of Cell 19-1-3 and is referred to as 19-1-3B. Waste placement is occurring from south to north, as shown in Photo 1. Odour was noted in the immediate vicinity of the active landfilling area.
- Construction of the southern half of Cell 19-1-3 has been completed. The northern portion is not currently constructed.
- Waste Transport Route: Site waste haulers are directed around the east side of the Process Area and enter Cell 19-1-3B from the east side, located at the north end of the constructed cell, on a dedicated haul road from the Waste Receiving Area.

2.2 Landfill Cap

The following provides a description of the status of the Landfill Cap, including cap placement during the second quarter, and the condition of the interim and final cap. With the recent approval of the vertical expansion, the previous capped areas are considered to be interim, since a portion of the cap will be removed and additional waste placed in these areas.

2.2.1 Interim and Final Cap Placement in Quarter

- The majority of the Site has received an interim cap, with the exception of the active landfilling area (Cell 19-1-3B and a portion of the adjoining 19-1-3A to the south).
- Cells 19-1-1 and 19-1-2 have received interim cap, as shown in Photo 2.

2.2.2 Interim Cap Conditions

- The interim cap was noted to be in good condition, with minor erosion channels observed.
- Interim cover material is available for placement on Cell 19-1-3B and the remainder of Cell 19-1-3A, currently stockpiled on Cell 19-1-2.
- Small areas of standing water were identified in several areas as described in Section 4. The interim cap requires minor grading to promote drainage to the perimeter ditches from these areas.
- Erosion channels should be addressed through additional clay placement and grading.

2.2.3 Final Cap Conditions

- Per Environmental Compliance Approval No. A031806, Notice No. 9 (dated October 19, 2015), no areas of the Site are considered to have received final capping. Per approval of the landfill expansion, all areas, as noted in Section 2.2.1, are considered to have received interim capping at this time.
- No areas have received topsoil. Natural vegetation is present in the northeast and southern (non-active) portions of the Site.

3. Perimeter Screening Berms

The following provides a description of the status of the Perimeter Screening Berms:

- Significant berm erosion was identified immediately west of proposed Cell 21-1. The erosion occurred on the landfill side of the berm, as identified on Figure 1 (previously identified in quarterly reports).
- Multiple larger erosion channels were identified on the landfill side of the north perimeter screening berm, as identified on Figure 1 (previously identified in quarterly reports).
- Minor erosion channels were noted throughout the Perimeter Screening Berms. These channels are prevalent throughout the un-vegetated internal sidewalls of the western and eastern perimeter screening berms.
- Several large erosion channels were noted on the elevated areas immediately northwest and southeast of the northern portion of the landfill. The erosion channels are located on plateaus/ramps within the screening berm. The erosion channels in the southeast corner extends into the east perimeter ditch.
- Note that all erosion channels within the Perimeter Screening Berms are on the internal sidewalls. The external sidewalls are in good condition and vegetated. As such, erosion channels do not create any external issues. The issue related to internal erosion is potential sedimentation of the perimeter ditches.

4. Surface Water Management System

The following provides a description of the status of the Surface Water Management System, including the ditches, swales, and surface water ponds.

4.1 Ditches and Swales

The following provides a description of the status of the surface water ditches and swales:

- Shallow ponding was identified within the southwest corner of the Original Landfill Area (OLA).
- Water levels were low within the southern perimeter ditch of the OLA. Pumping was not active during the Inspection.
- No standing water was identified within the northwest corner of the OLA, rather the area was damp as shown in Photo 3. The area has been graded to drain to the north ditch with an internal swale. The internal swale was dry during the Inspection.
- Minimal standing water was noted in the northwest portion of proposed Cell 21-3 (i.e., located centrally in the northern portion of the Site), as shown in Photo 4. The two drainage paths had minimal standing water.
- Water levels continue to be high in the central portion of the north ditch, as shown in Photo 5. High water levels in the north ditch have the potential to prohibit surface drainage from the OLA during wetter periods.

- There was no standing water in the perimeter ditch in the northeast corner of the Site (i.e., at the location of the former perimeter screening berm access road).
- Flow from the north ditch to the eastern ditch is impeded by sedimentation in the northeast corner of the Site, likely brought on by dense wetland vegetation within the ditch and sedimentation, as shown in Photo 6 and Figure 1.
- Sedimentation is occurring in the east ditch as a result of erosion of the perimeter screening berm, along the entire length of the OLA, resulting in fluctuations in grade and flow breaks. Erosion channels range from minor to large. Minimal standing water was observed in the southern half of the ditch.
- Significant erosion was identified in the southeast corner of the OLA, resulting in sedimentation of the perimeter ditch and limited water flow, as shown in Photo 7 and Figure 1. Minimal standing water was observed in the southeast ditch and the internal swale to the north.
- It was noted during previous Inspections that there was limited elevation difference available within the northeast corner of the perimeter ditch. As such, there is minimal ability to lower the base of ditch and maintain flow to the East Surface Water Pond.
- The east perimeter ditch was damp to dry between the OLA and the East Surface Water Pond. Erosion channels at the borrow area driveway have been repaired.
- There is a flow break in the south ditch, beneath the access bridge located at Gate 6, as a result of wildlife activity (i.e., beavers), as shown in Photo 8. No flow was noted through the dam.
- Higher water levels were identified in the central portion of the south ditch with no observed flow, due to significant sedimentation and accumulation of loose vegetation in the southwest corner of the perimeter ditch, impeding flow of water toward the West Surface Water Pond. A clear picture of the blockage could not be obtained due to dense vegetation.
- A seep was identified in the southern portion of future Cell 19-2, outside of the active landfilling area. The seep contained orange staining and was observed draining to the south perimeter ditch via overland flow. Clean Harbors was notified during the post-Inspection meeting and is undertaking actions to address and mitigate the seepage.

4.2 East Surface Water Pond

The following provides a description of the status of the East Surface Water Pond (Photo 9):

- Water levels within the East Surface Water Pond were low, below the base elevation of the inlet ditch.
- No flow was observed entering the East Surface Water Pond.
- The pump at the East Surface Water Pond was not in operation at the time of Inspection.

4.3 West Surface Water Pond

The following provides a description of the status of the West Surface Water Pond (Photo 10):

- Water levels within the West Surface Water Pond were low.

- No flow was observed entering the West Surface Water Pond.
- The pump at the West Surface Water Pond was not in operation at the time of Inspection.

4.4 Equalization Pond

The following provides a description of the status of the Equalization Pond (Photo 11):

- Water levels within the Equalization Pond were moderate. Flow was not observed entering the Equalization Pond at the time of Inspection.
- Cracking and sloughing of the concrete side walls of the Equalization Pond was observed during the Inspection. Additional sloughing was noted in several areas around the perimeter.
- Fish were observed within the Equalization Pond.

5. Process Water Management System

The Process Water Management System consists of three ponds and a series of ditches and swales. The North Process Water Pond is located immediately west of the TDU area, the South Process Water Pond is located immediately south of the Incinerator, and the West Process Water Pond is located adjacent to the West Surface Water Pond. Water retained in the Process Water Management System is used as quench water for Site incineration operations.

5.1 Process Water Ditches and Swales

The following provides a description of the status of the process water ditches and swales:

- The process water ditch adjacent to the TDU area exhibited a moderate water level at the time of Inspection. This ditch was not being pumped at the time of Inspection. Erosion channels immediately to the west, along the shoulder of the Landfill Container Compound access road.
- The ditches feeding the North Process Water Pond have significant sediment buildup in the riprap and culverts, as shown in Photo 12, as well as culvert damage. These factors impede flow, resulting in standing water within the ditches and potential for draining over top of adjacent driveways during heavy rain events. It is recommended that sediment be removed and culvert(s) be repaired as necessary to promote drainage.
- The small ditches near the South Process Water Pond were dry.

5.2 North Process Water Pond

The following provides a description of the status of the North Process Water Pond (Photo 13):

- The water level within the North Process Water Pond was very low, well below the ditch inlet and culvert outlets.
- The pump at the North Process Water Pond was running at the time of the Inspection.

- A significant washout remains in the southeast corner of the North Process Water Pond. Some large rip rap has been placed in the washout, however, repair of the side slope is necessary.

5.3 South Process Water Pond

The following provides a description of the status of the South Process Water Pond (Photo 14):

- The water level within the South Process Water Pond was moderate.
- It was noted that this area is also receiving runoff from east of the active landfill area. Partial vegetative blockage of this drainage path was identified immediately east of the South Process Water Pond, limiting drainage of the undeveloped Cell 19-1 area.

5.4 West Process Water Pond

The following provides a description of the status of the West Process Water Pond, which is used for process water storage:

- The water level within the West Process Water Pond was moderate.

6. Leachate Management System

The leachate reservoirs are designed to receive leachate from the active fill area and process areas. Leachate transferred from the active fill area is detained within the leachate reservoirs prior to transfer to the incinerator for disposal.

6.1 South Leachate Reservoir

The following provides a description of the status of the South Leachate Reservoir (Photo 15):

- The South Leachate Reservoir is equipped with a permanent floating cover. The South Reservoir is currently being used for leachate storage, with leachate pumped from the New Leachate Reservoir.
- Clean Harbors maintains a record of the volume of leachate within the South Leachate Reservoir.

6.2 East Leachate Reservoir

The following provides a description of the status of the East Leachate Reservoir (Photo 16):

- The East Leachate Reservoir is equipped with a permanent floating cover. The East Reservoir is currently being used for leachate storage, but is not currently actively receiving leachate.
- Clean Harbors maintains a record of the volume of leachate within the East Leachate Reservoir.

6.3 New Leachate Reservoir

The following provides a description of the status of the New Leachate Reservoir (Photo 17):

- The new Leachate Reservoir has been constructed immediately east of the East Leachate Reservoir and is equipped with a permanent floating cover. The new Leachate Reservoir is currently operational and is

being used for leachate storage, based on observation of the cover. Leachate is being pumped from this Reservoir to the South Leachate Reservoir as required.

- Clean Harbors maintains a record of the volume of leachate within the New Leachate Reservoir.

6.4 Leachate Storage Tank and Pumping System

The following provides a description of the status of the Leachate Storage Tank and Pumping System:

- The Leachate Storage Tank is in operation, serving as the feed tank to the incinerator.

7. Waste Processing Operations

The following provides a description of the Waste Processing Operations:

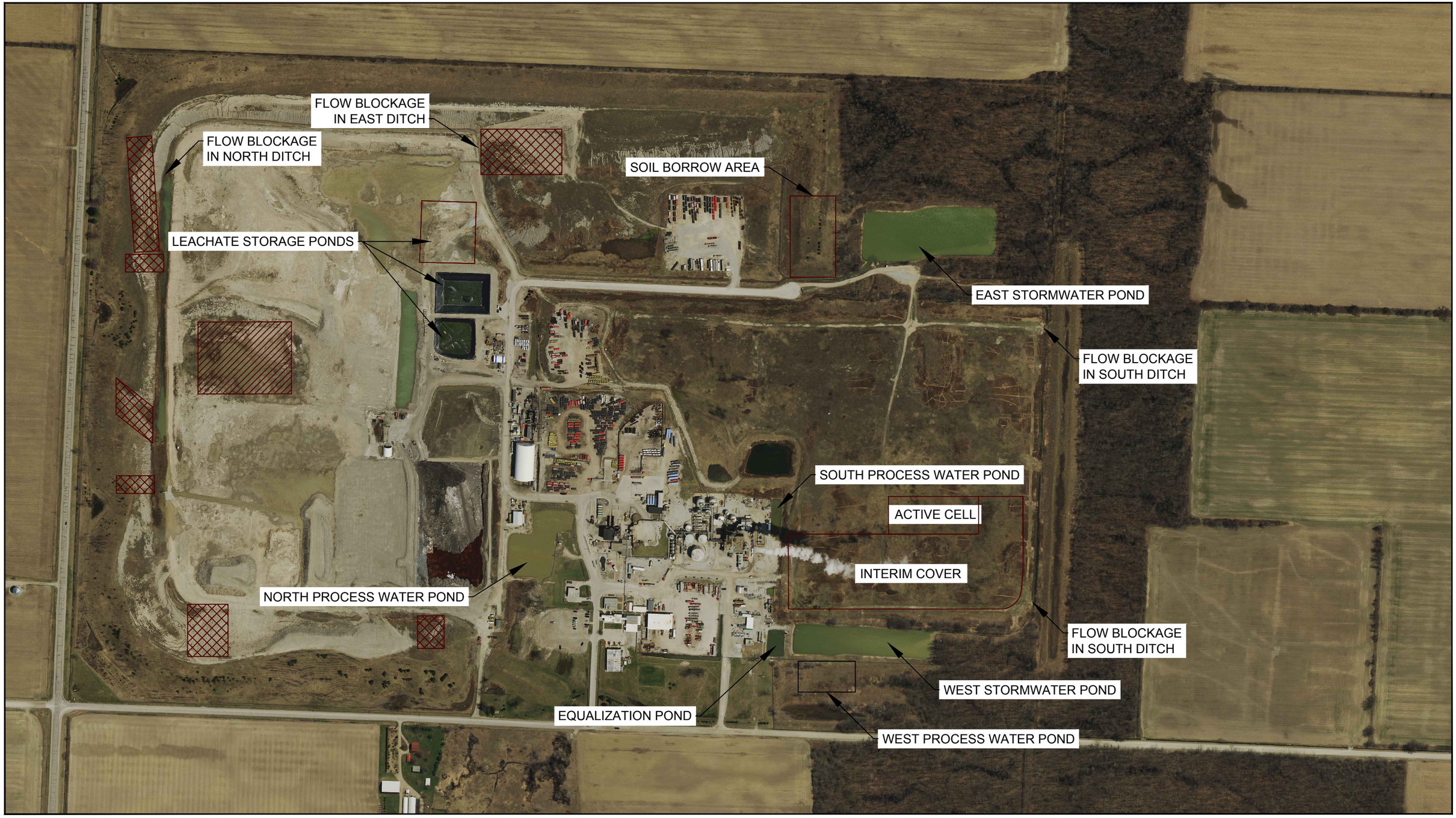
- Odour was noted in the vicinity of active landfilling operations in Cell 19-1-3A, likely originating from the active landfilling area.
- A slight odour was noted east of the TDU area.
- A slight odour was noted at the east perimeter berm, near the southeast corner of the OLA, during periods of high wind.
- Identified odours were not identified beyond Site boundaries.

8. Conclusions and Recommendations

Interim cover work has been completed in the northern area of the Site. As such, the former stockpile area and other areas in the north that have periodic standing water are scheduled to be assessed and re-graded to promote drainage.

Maintenance of the perimeter ditches is required to remove areas where sediment has accumulated and is restricting flow of water. Maintenance of the perimeter ditches is a key component to minimize ponding of water on the interim cover and transfer of water to surface water ponds. It is recommended that perimeter ditch maintenance be undertaken to remove blockages as noted. The maintenance work should minimize the potential for flooding during storm events.

Portions of the interior side of the perimeter screening berms have significant erosion. These areas should be assessed and corrected to minimize erosion into the perimeter ditches. Installation of reinforced ditches from the top of berm to the perimeter ditches may be a solution for these areas, as well as vegetation of the internal berm slopes.



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LEGEND:

LARGE EROSION CHANNELS

LARGE AREAS OF SURFACE WATER PONDING

GHD

LAMBTON FACILITY
CLEAN HARBORS CANADA INC.
2018 SECOND QUARTER SITE INSPECTION

SITE PLAN

44985-16

Jun 13, 2018

FIGURE 1

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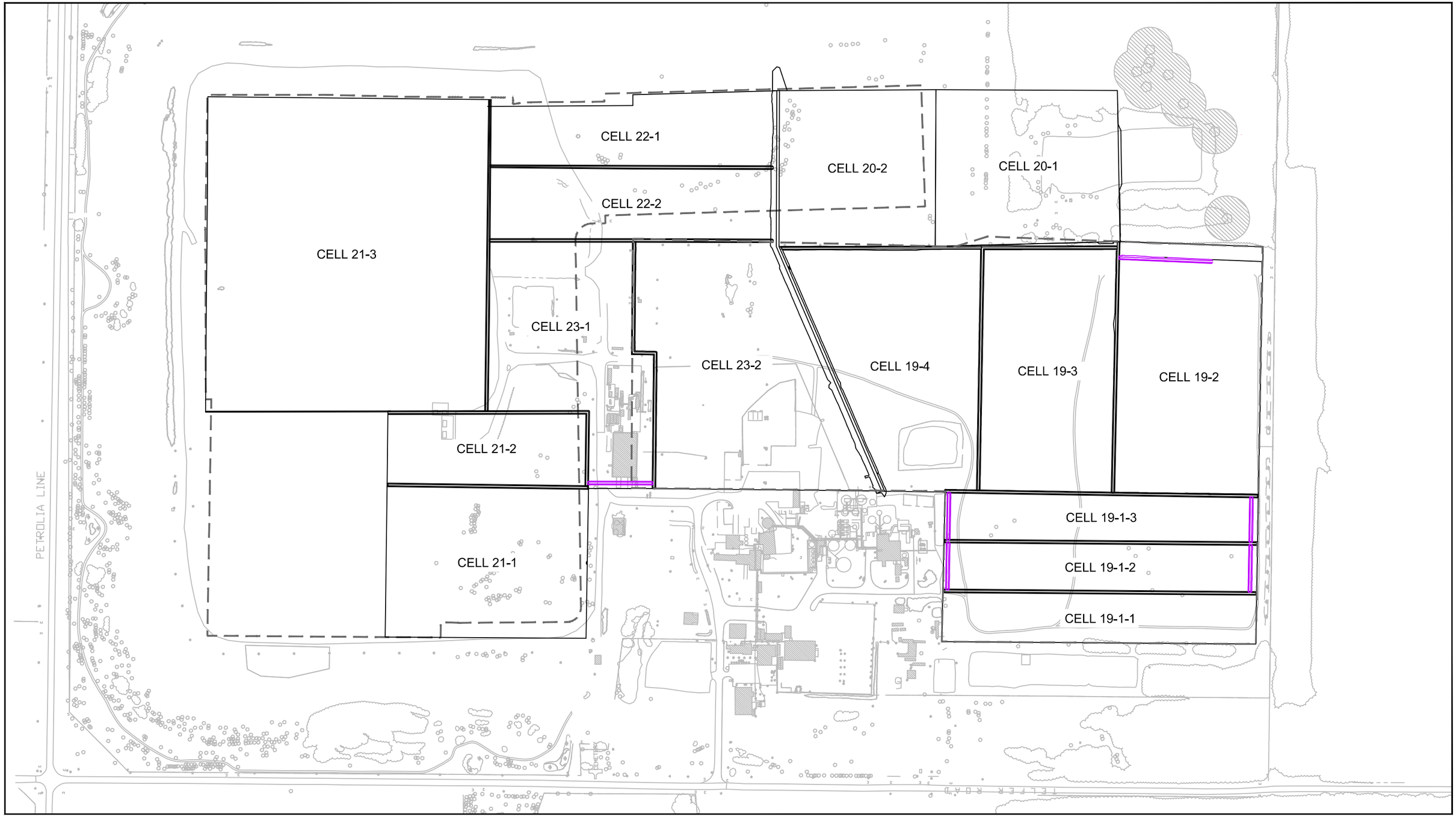

Source: DESIGN AND OPERATIONS REPORT - LAMBTON LANDFILL EXPANSION, CLEAN HARBORS CANADA, INC. PREPARED BY TETRA TECH WEI INC. DATED OCTOBER 8, 2015

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LAMBTON FACILITY
CLEAN HARBORS CANADA INC.
2018 SECOND QUARTER SITE INSPECTION

LANDFILL EXPANSION SUBCELL FILL EXPANSION PLAN

44985-16

Jun 13, 2018

FIGURE 2

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Attachment 1
Photographic Log

Photo 1 - Active landfilling cell (southern portion of Cell 19-1-3)

Photo 2 - Interim cap placement, Cells 19-1-1 and 19-1-2

Photo 3 - Northwest corner of Site

Photo 4 - Standing water in northern, central portion of Site

Photo 5 - High water levels in central portion of north perimeter ditch

Photo 6 - North ditch, surface water blockage

Photo 7 - North landfill area, southeast ditch, partial surface water blockage

Photo 8 - South ditch, surface water blockage west of access bridge

Photo 9 - East Surface Water Pond

Photo 10 - West Surface Water Pond

Photo 11 - Equalization Pond

Photo 12 - North Process Water Pond ditch

Photo 13 - North Process Water Pond

Photo 14 - South Process Water Pond

Photo 15 - South Leachate Reservoir

Photo 16 - East Leachate Reservoir

Photo 17 - New Leachate Reservoir

Appendix C
2018 Third Quarter Site Inspection

Memorandum

October 18, 2018

To:	Erica Carabott/Clean Harbors Mike Parker/Clean Harbors	Ref. No.:	044985
From:	Jim Yardley/Neil Shannick/mg/45	Tel:	519-340-4265
Subject:	**2018 Third Quarter Site Inspection**		

1. Introduction

In accordance with requirements outlined in Section 8.1 of the Design and Operations Report, GHD conducted the 2018 third quarter Site Inspection (Inspection) of the Clean Harbors Canada, Inc. (Clean Harbors) Lambton Facility (Site) in Corunna, Ontario. The Inspection was conducted on September 24, 2018 by Neil Shannick.

The Inspection consisted of a walk around the Site. The Inspection focused primarily on the active landfill and waste disposal operations, including an inspection of each of the surface water, leachate, and process water ponds.

1.1 Weather and Site Conditions

At the time of the Inspection, the temperature was 13°C. Weather conditions at the Site were overcast and windy, with wind blowing from east to west. During the week preceding the Inspection, the Site experienced 2.8 mm of total precipitation, and a mean temperature of 17.5°C. During the Inspection, the Site was generally dry to damp. Standing water was noted in low, flat areas and high water levels were were noted in several ditches. Figure 1 provides a Site plan showing features referenced herein, as well as any notes related to specific issues noted in this memorandum. Figure 2 provides the Landfill Expansion Subcell Fill Progression Plan, identifying the cell locations, as presented in the "*Design and Operations Report - Lambton Landfill Expansion, Clean Harbors Canada, Inc.*", as prepared by Tetra Tech WEI Inc., dated October 8, 2015.

2. Landfill Operations

The Inspection was focused on landfill and waste disposal operations including Cell development, active disposal, waste hauling, and landfill capping efforts.

2.1 Landfill Cell Development

The following provides a description of the status of the Landfill Cell Development, including active waste disposal operations and internal waste transport routes:

- The active waste tipping face is located in the northern portion of Cell 19-1-3 and is referred to as 19-1-3A. Waste placement is occurring from south to north, as shown in Photo 1. Odour was noted in the immediate vicinity of the active landfilling area. A gap in landfilling is present to allow access from the central portion of the cell.
- Construction of Cell 19-1-3 has been completed.
- Waste Transport Route: Site waste haulers are directed around the east side of the Process Area and enter Cell 19-1-3B from the east side, located at the south end of the active landfilling area, on a dedicated haul road from the Waste Receiving Area.

2.2 Landfill Cap

The following provides a description of the status of the Landfill Cap, including cap placement during the third quarter, and the condition of the interim and final cap. With the recent approval of the vertical expansion, the previous capped areas are considered to be interim, since a portion of the cap will be removed and additional waste placed in these areas.

2.2.1 Interim and Final Cap Placement in Quarter

- The majority of the Site has received an interim cap, with the exception of the active landfilling area (Cell 19-1-3A and the east side wall of Cells 19-1-3B and 19-1-3C).
- Cells 19-1-1 and 19-1-2 have received interim cap, as shown in Photo 2.

2.2.2 Interim Cap Conditions

- The interim cap was noted to be in good condition, with minor erosion channels observed.
- Interim cover material is available for placement on Cell 19-1-3A and the remainder of Cell 19-1-3B, currently stockpiled on Cell 19-1-2.
- Small areas of standing water were identified in several areas as described in Section 4. The interim cap requires minor grading to promote drainage to the perimeter ditches from these areas.
- Erosion channels should be addressed through additional clay placement and grading.

2.2.3 Final Cap Conditions

- Per Environmental Compliance Approval No. A031806, Notice No. 9 (dated October 19, 2015), no areas of the Site are considered to have received final capping. Per approval of the landfill expansion, all areas, as noted in Section 2.2.1, are considered to have received interim capping at this time.
- No areas have received topsoil. Natural vegetation is present in the northeast and southern (non-active) portions of the Site.

3. Perimeter Screening Berms

The following provides a description of the status of the Perimeter Screening Berms:

- Significant berm erosion was identified immediately west of proposed Cell 21-1. The erosion occurred on the landfill side of the berm, as identified on Figure 1 (previously identified in quarterly reports).
- Multiple larger erosion channels were identified on the landfill side of the north perimeter screening berm, as identified on Figure 1 (previously identified in quarterly reports).
- Minor erosion channels were noted throughout the Perimeter Screening Berms. These channels are prevalent throughout the un-vegetated internal sidewalls of the western and eastern perimeter screening berms.
- Several large erosion channels were noted on the elevated areas immediately northwest and southeast of the northern portion of the landfill. The erosion channels are located on plateaus/ramps within the screening berm. The erosion channels in the southeast corner extends into the east perimeter ditch.
- Note that all erosion channels within the Perimeter Screening Berms are on the internal sidewalls. The external sidewalls are in good condition and vegetated. As such, erosion channels do not create any external issues. The issue related to internal erosion is potential sedimentation of the perimeter ditches.

4. Surface Water Management System

The following provides a description of the status of the Surface Water Management System, including the ditches, swales, and surface water ponds.

4.1 Ditches and Swales

The following provides a description of the status of the surface water ditches and swales:

- Shallow standing water was identified within the southwest corner of the Original Landfill Area (OLA).
- Water levels were very low within the southern perimeter ditch of the OLA. Pumping was not active during the Inspection.
- Shallow standing water was identified within the northwest corner of the OLA, as shown on Figure 1 and Photo 3. The area has been graded to drain to the north ditch with an internal swale. The internal swale was damp with minimal standing water during the Inspection.
- Standing water was noted in the northwest portion of proposed Cell 21-3 (i.e., located centrally in the northern portion of the Site), as shown in Photo 4. The two drainage paths were nearly full during the Inspection, with no observed flow.
- Water levels continue to be high in the central portion of the north ditch, as shown in Photo 5. High water levels in the north ditch have the potential to prohibit surface drainage from the OLA during wetter periods. Significant algal growth was evident during the Inspection.

- There was no standing water in the perimeter ditch in the northeast corner of the Site (i.e., at the location of the former perimeter screening berm access road).
- Flow from the north ditch to the eastern ditch is impeded by sedimentation in the northeast corner of the Site, likely brought on by dense wetland vegetation within the ditch and sedimentation, as shown in Photo 6 and Figure 1.
- Sedimentation is occurring in the east ditch as a result of erosion of the perimeter screening berm, along the entire length of the OLA, resulting in fluctuations in grade and flow breaks. Erosion channels range from minor to large. Minimal standing water was observed in the southern half of the ditch.
- Significant erosion was identified in the southeast corner of the OLA, resulting in sedimentation of the perimeter ditch and limited water flow, as shown in Photo 7 and Figure 1. Minimal standing water was observed in the southeast ditch. High levels of standing water were observed in the internal swale to the north.
- It was noted during previous Inspections that there was limited elevation difference available within the northeast corner of the perimeter ditch. As such, there is minimal ability to lower the base of ditch and maintain flow to the East Surface Water Pond.
- The east perimeter ditch was damp to dry between the OLA and the East Surface Water Pond. Erosion channels at the borrow area driveway have been repaired. Minor red staining was observed at the borrow area driveway.
- There is a flow break in the south ditch, immediately east of the access bridge located at Gate 6, as a result of wildlife activity (i.e., beavers), as shown in Photo 8. Trickle flow was noted through the dam, with significant algal growth in the immediate vicinity.
- Higher water levels were identified in the central portion of the south ditch with no observed flow, due to significant sedimentation and accumulation of loose vegetation in the southwest corner of the perimeter ditch, impeding flow of water toward the West Surface Water Pond. A clear picture of the blockage could not be obtained due to dense vegetation.
- A previously identified seep in the southern portion of future Cell 19-2 was observed during the Inspection, outside of the active landfilling area. The seep contained orange and black staining and was observed. Temporary berms have been constructed to drain the seep into the base of Cell 19-1-3C.

4.2 East Surface Water Pond

The following provides a description of the status of the East Surface Water Pond (Photo 9):

- Water levels within the East Surface Water Pond were low to moderate.
- No flow was observed entering the East Surface Water Pond.
- The pump at the East Surface Water Pond was not in operation at the time of Inspection.

4.3 West Surface Water Pond

The following provides a description of the status of the West Surface Water Pond (Photo 10):

- Water levels within the West Surface Water Pond were very low.
- No flow was observed entering the West Surface Water Pond.
- The pump at the West Surface Water Pond was not in operation at the time of Inspection.

4.4 Equalization Pond

The following provides a description of the status of the Equalization Pond (Photo 11):

- Water levels within the Equalization Pond were moderate. Flow was not observed entering the Equalization Pond at the time of Inspection.
- Cracking and sloughing of the concrete side walls of the Equalization Pond was observed during the Inspection. Additional sloughing was noted in several areas around the perimeter.
- Fish were not observed within the Equalization Pond.

5. Process Water Management System

The Process Water Management System consists of three ponds and a series of ditches and swales. The North Process Water Pond is located immediately west of the TDU area, the South Process Water Pond is located immediately south of the Incinerator, and the West Process Water Pond is located adjacent to the West Surface Water Pond. Water retained in the Process Water Management System is used as quench water for Site incineration operations.

5.1 Process Water Ditches and Swales

The following provides a description of the status of the process water ditches and swales:

- The process water ditch adjacent to the TDU area exhibited a low water level at the time of Inspection, with significant algal growth. This ditch was not being pumped at the time of Inspection. Erosion channels were observed immediately to the west, along the shoulder of the Landfill Container Compound access road.
- The ditches feeding the North Process Water Pond have significant sediment buildup and algal growth in the riprap and culverts, as shown in Photo 12, as well as culvert damage. These factors impede flow, resulting in standing water within the ditches and potential for draining over top of adjacent driveways during heavy rain events. It is recommended that sediment be removed and culvert(s) be repaired as necessary to promote drainage.
- The small ditches near the South Process Water Pond were dry.

5.2 North Process Water Pond

The following provides a description of the status of the North Process Water Pond (Photo 13):

- The water level within the North Process Water Pond was very low, below the ditch inlet and culvert outlets.
- The pump at the North Process Water Pond was running at the time of the Inspection.
- A significant washout remains in the southeast corner of the North Process Water Pond. Some large rip rap has been placed in the washout, however, repair of the side slope is necessary.

5.3 South Process Water Pond

The following provides a description of the status of the South Process Water Pond (Photo 14):

- The water level within the South Process Water Pond was very low.
- It was noted that this area is also receiving runoff from east of the active landfill area. Partial vegetative blockage of this drainage path was identified immediately east of the South Process Water Pond, limiting drainage of the undeveloped area adjacent to Cell 19-1.

5.4 West Process Water Pond

The following provides a description of the status of the West Process Water Pond, which is used for process water storage:

- The water level within the West Process Water Pond was moderate.

6. Leachate Management System

The leachate reservoirs are designed to receive leachate from the active fill area and process areas. Leachate transferred from the active fill area is detained within the leachate reservoirs prior to transfer to the incinerator for disposal.

6.1 South Leachate Reservoir

The following provides a description of the status of the South Leachate Reservoir (Photo 15):

- The South Leachate Reservoir is equipped with a permanent floating cover. The South Reservoir is currently being used for leachate storage, with leachate pumped from the New Leachate Reservoir. Pumping was occurring during the Inspection and the South Leachate Reservoir was nearly full.
- Clean Harbors maintains a record of the volume of leachate within the South Leachate Reservoir.

6.2 East Leachate Reservoir

The following provides a description of the status of the East Leachate Reservoir (Photo 16):

- The East Leachate Reservoir is equipped with a permanent floating cover. The East Reservoir is currently being used for leachate storage, but is not currently actively receiving leachate. The East Reservoir was nearly full.
- Clean Harbors maintains a record of the volume of leachate within the East Leachate Reservoir.

6.3 New Leachate Reservoir

The following provides a description of the status of the New Leachate Reservoir (Photo 17):

- The new Leachate Reservoir has been constructed immediately east of the East Leachate Reservoir and is equipped with a permanent floating cover. The new Leachate Reservoir is currently operational and is being used for leachate storage, based on observation of the cover. Leachate is being pumped from this Reservoir to the South Leachate Reservoir as required. Pumping was active during the Inspection, as the new Leachate Reservoir is nearly full.
- Clean Harbors maintains a record of the volume of leachate within the New Leachate Reservoir.

6.4 Leachate Storage Tank and Pumping System

The following provides a description of the status of the Leachate Storage Tank and Pumping System:

- The Leachate Storage Tank is in operation, serving as the feed tank to the incinerator.

7. Waste Processing Operations

The following provides a description of the Waste Processing Operations:

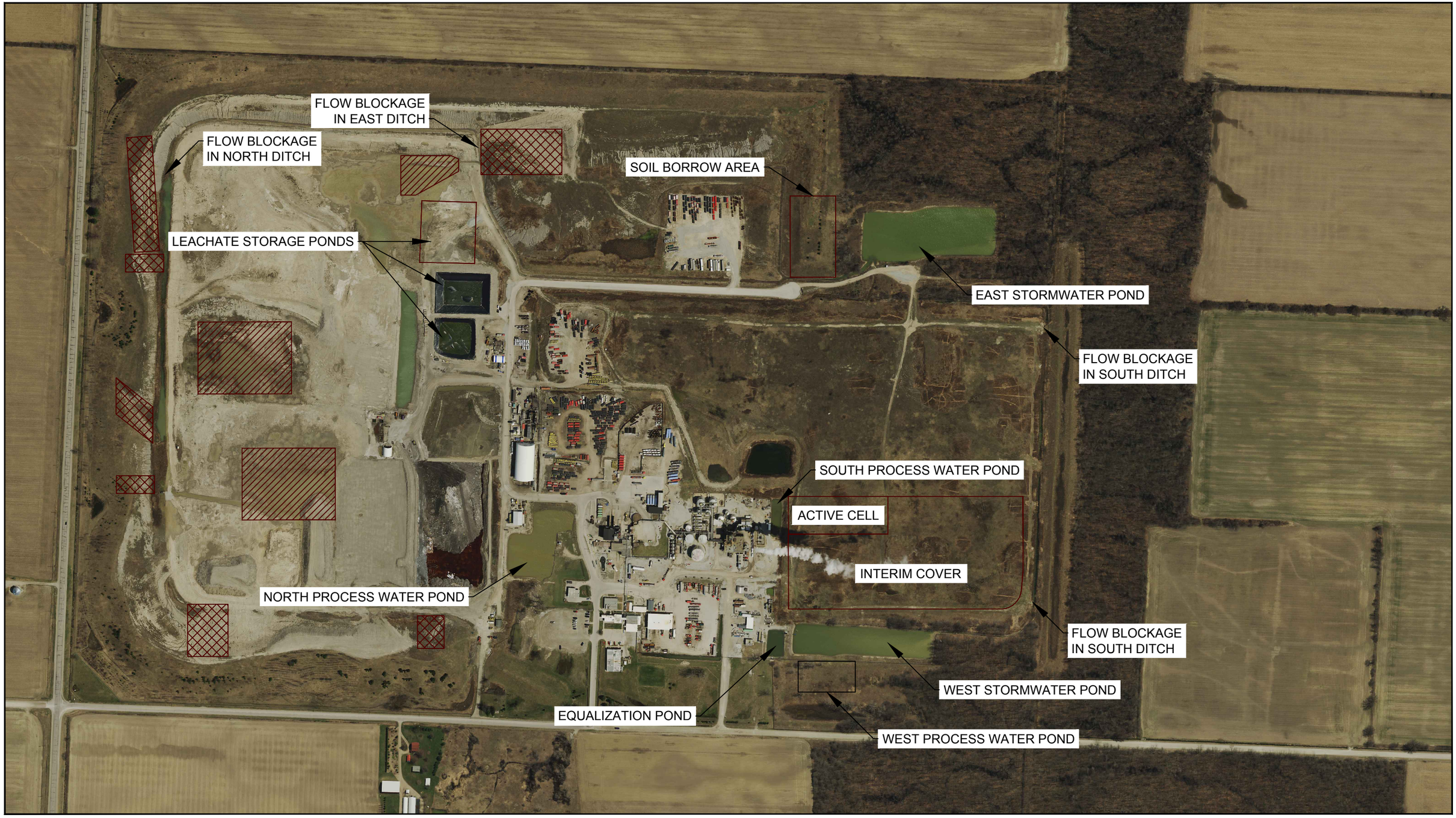
- Odour was noted in the vicinity of active landfilling operations in Cell 19-1-3A, likely originating from the active landfilling area.
- A slight odour was noted east of the TDU area.
- Identified odours were not identified beyond Site boundaries.

8. Conclusions and Recommendations

Interim cover work has been completed in the northern area of the Site. As such, the former stockpile area and other areas in the north that have periodic standing water are scheduled to be assessed and re-graded to promote drainage.

Maintenance of the perimeter ditches is required to remove areas where sediment has accumulated and is restricting flow of water. Maintenance of the perimeter ditches is a key component to minimize standing water on the interim cover and promote transfer of water to surface water ponds. It is recommended that perimeter ditch maintenance be undertaken to remove blockages as noted. The maintenance work should minimize the potential for flooding during storm events.

Portions of the interior side of the perimeter screening berms have significant erosion. These areas should be assessed and corrected to minimize erosion into the perimeter ditches. Installation of reinforced ditches from the top of berm to the perimeter ditches may be a solution for these areas, as well as vegetation of the internal berm slopes.



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LEGEND:

LARGE EROSION CHANNELS

LARGE AREAS OF STANDING WATER

LAMBTON FACILITY
CLEAN HARBORS CANADA INC.
2018 THIRD QUARTER SITE INSPECTION

SITE PLAN

44985-16

Oct 17, 2018

FIGURE 1

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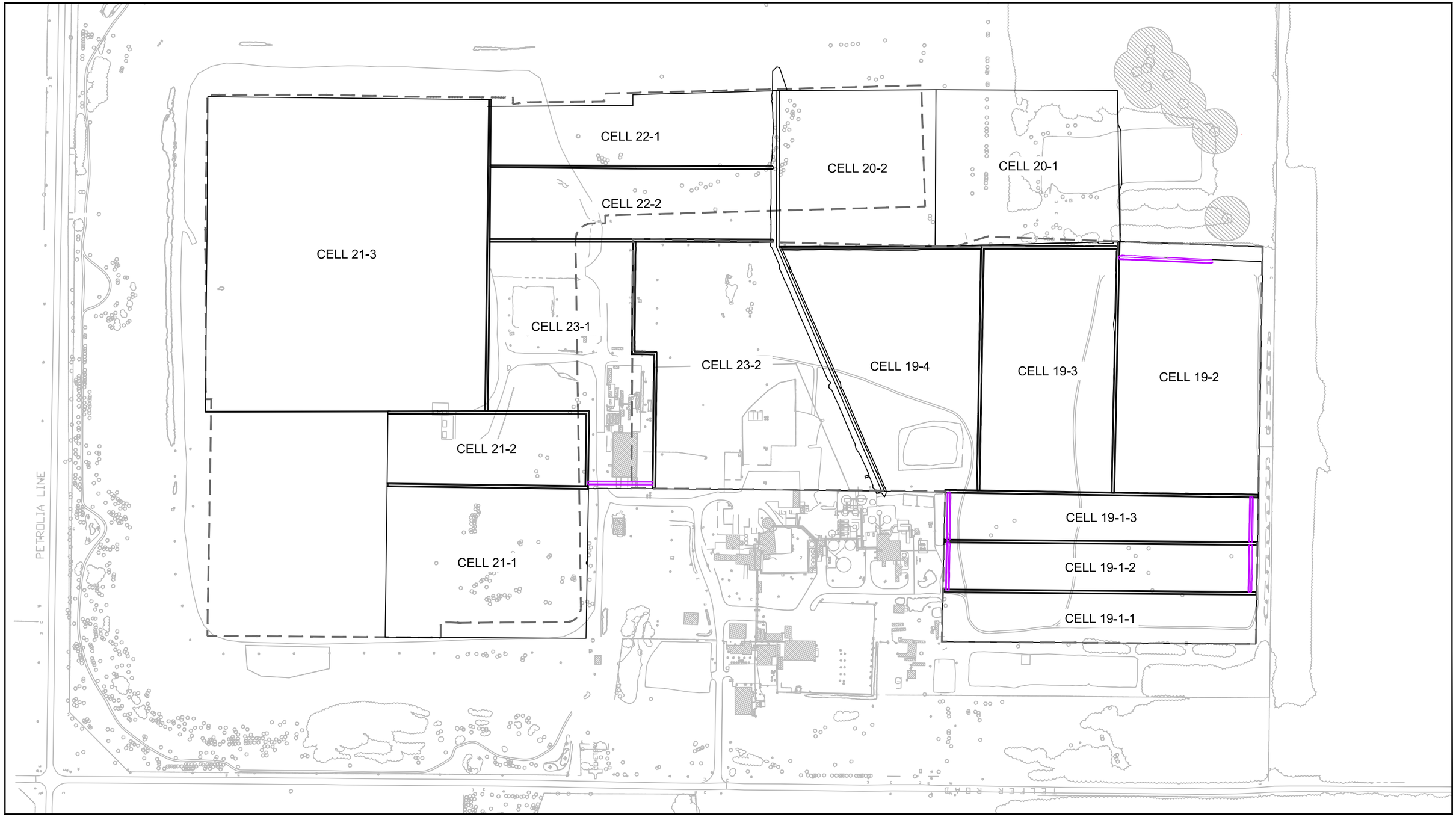

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LAMBTON FACILITY
CLEAN HARBORS CANADA INC.
2018 THIRD QUARTER SITE INSPECTION

LANDFILL EXPANSION SUBCELL FILL EXPANSION PLAN

44985-16

Oct 17, 2018

FIGURE 2

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Attachment 1
Photographic Log

Photo 1 - Active landfilling cell (northern portion of Cell 19-1-3)

Photo 2 - Interim cap placement, Cells 19-1-1 and 19-1-2

Photo 3 - Northwest corner of Site

Photo 4 - Standing water in northern, central portion of Site

Photo 5 - High water levels in central portion of north perimeter ditch

Photo 6 - North ditch, surface water blockage

Photo 7 - North landfill area, southeast ditch, partial surface water blockage

Photo 8 - South ditch, surface water blockage east of access bridge

Photo 9 - East Surface Water Pond

Photo 10 - West Surface Water Pond

Photo 11 - Equalization Pond

Photo 12 - North Process Water Pond ditch

Photo 13 - North Process Water Pond

Photo 14 - South Process Water Pond

Photo 15 - South Leachate Reservoir

Photo 16 - East Leachate Reservoir

Photo 17 - New Leachate Reservoir

Appendix D
2018 Fourth Quarter Site Inspection

Memorandum

December 10, 2018

To:	Erica Carabott/Clean Harbors Mike Parker/Clean Harbors	Ref. No.:	044985
From:	Jim Yardley/Neil Shannick/mg/48	Tel:	519-340-4265
Subject:	**2018 Fourth Quarter Site Inspection**		

1. Introduction

In accordance with requirements outlined in Section 8.1 of the Design and Operations Report, GHD conducted the 2018 fourth quarter Site Inspection (Inspection) of the Clean Harbors Canada, Inc. (Clean Harbors) Lambton Facility (Site) in Corunna, Ontario. The Inspection was conducted on November 26, 2018 by Neil Shannick.

The Inspection consisted of a walk around the Site. The Inspection focused primarily on the active landfill and waste disposal operations, including an inspection of each of the surface water, leachate, and process water ponds.

1.1 Weather and Site Conditions

At the time of the Inspection, the temperature was 3°C. Weather conditions at the Site were overcast and windy, with light rain. The wind was blowing from north to south. During the week preceding the Inspection, the Site experienced 22.4 mm of total precipitation, and a mean temperature of 0.4°C. During the Inspection, the Site was very wet. Standing water was noted in low, flat areas and high water levels were noted in the majority of ditches and ponds. Figure 1 provides a Site plan showing features referenced herein, as well as any notes related to specific issues noted in this memorandum. Figure 2 provides the Landfill Expansion Subcell Fill Progression Plan, identifying the cell locations, as presented in the "*Design and Operations Report - Lambton Landfill Expansion, Clean Harbors Canada, Inc.*", as prepared by Tetra Tech WEI Inc., dated October 8, 2015.

2. Landfill Operations

The Inspection was focused on landfill and waste disposal operations including Cell development, active disposal, waste hauling, and landfill capping efforts.

2.1 Landfill Cell Development

The following provides a description of the status of the Landfill Cell Development, including active waste disposal operations and internal waste transport routes:

- The active waste tipping face is located in the northern portion of Cell 19-1-3 and is referred to as 19-1-3A. Waste placement is generally occurring from north to south, as shown in Photo 1. Odour was noted in the immediate vicinity of the active landfilling area. A gap in landfilling is present to allow access from the central portion of the cell.
- Construction of the western portion of Cell 19-2 is in progress.
- Waste Transport Route: Site waste haulers are directed around the east side of the Process Area and enter Cell 19-1-3B from the east side, located at the south end of the active landfilling area, on a dedicated haul road from the Waste Receiving Area.

2.2 Landfill Cap

The following provides a description of the status of the Landfill Cap, including cap placement during the third quarter, and the condition of the interim and final cap. With the recent approval of the vertical expansion, the previous capped areas are considered to be interim, since a portion of the cap will be removed and additional waste placed in these areas.

2.2.1 Interim and Final Cap Placement in Quarter

- The majority of the Site has received an interim cap, with the exception of the active landfilling area (Cell 19-1-3A and the east side wall of Cells 19-1-3B and 19-1-3C).
- Cells 19-1-1 and 19-1-2 have received interim cap, as shown in Photo 2.

2.2.2 Interim Cap Conditions

- The interim cap was noted to be in good condition, with minor erosion channels observed.
- Interim cover material is available for placement on Cell 19-1-3A and the remainder of Cell 19-1-3B, currently stockpiled on Cell 19-1-2.
- Large areas of standing water were identified in several areas as described in Section 4. The interim cap requires minor grading to promote drainage to the perimeter ditches from these areas.
- Erosion channels should be addressed through additional clay placement and grading.

2.2.3 Final Cap Conditions

- Per Environmental Compliance Approval No. A031806, Notice No. 9 (dated October 19, 2015), no areas of the Site are considered to have received final capping. Per approval of the landfill expansion, all areas, as noted in Section 2.2.1, are considered to have received interim capping at this time.
- No areas have received topsoil. Natural vegetation is present in the northeast and southern (non-active) portions of the Site.

3. Perimeter Screening Berms

The following provides a description of the status of the Perimeter Screening Berms:

- Significant berm erosion was identified immediately west of proposed Cell 21-1. The erosion occurred on the landfill side of the berm, as identified on Figure 1 (previously identified in quarterly reports).
- Multiple larger erosion channels were identified on the landfill side of the north perimeter screening berm, as identified on Figure 1 (previously identified in quarterly reports).
- Minor erosion channels were noted throughout the Perimeter Screening Berms. These channels are prevalent throughout the un-vegetated internal sidewalls of the western and eastern perimeter screening berms.
- Several large erosion channels were noted on the elevated areas immediately northwest and southeast of the northern portion of the landfill. The erosion channels are located on plateaus/ramps within the screening berm. The erosion channels in the southeast corner extends into the east perimeter ditch.
- Note that all erosion channels within the Perimeter Screening Berms are on the internal sidewalls. The external sidewalls are in good condition and vegetated. As such, erosion channels do not create any external issues. The issue related to internal erosion is potential sedimentation of the perimeter ditches.

4. Surface Water Management System

The following provides a description of the status of the Surface Water Management System, including the ditches, swales, and surface water ponds.

4.1 Ditches and Swales

The following provides a description of the status of the surface water ditches and swales:

- Shallow standing water was identified within the southwest corner of the Original Landfill Area (OLA).
- Water levels were very high within the southern perimeter ditch of the OLA. Pumping was active during the Inspection.
- Standing water was identified within the northwest corner of the OLA, as shown on Figure 1 and Photo 3. The area has been graded to drain to the north ditch with an internal swale. The internal swale was full, with no observed flow during the Inspection.
- Standing water was noted in the northwest portion of proposed Cell 21-3 (i.e., located centrally in the northern portion of the Site), as shown in Photo 4. The two drainage paths were under water during the Inspection, with no observed flow.
- Water levels continue to be high in the central portion of the north ditch, as shown in Photo 5. High water levels in the north ditch have the potential to prohibit surface drainage from the OLA during wetter periods. Significant algal growth was evident during the Inspection, visible at the far end of Photo 5.

- There was minimal standing water in the perimeter ditch in the northeast corner of the Site (i.e., at the location of the former perimeter screening berm access road).
- Flow from the north ditch to the eastern ditch is impeded by sedimentation in the northeast corner of the Site, likely brought on by dense wetland vegetation within the ditch and sedimentation, as shown in Photo 6 and Figure 1.
- Sedimentation is occurring in the east ditch as a result of erosion of the perimeter screening berm, along the entire length of the OLA, resulting in fluctuations in grade and flow breaks. Erosion channels range from minor to large. Standing water was observed along the entire length of the ditch, with limited flow observed.
- Significant erosion was identified in the southeast corner of the OLA, resulting in sedimentation of the perimeter ditch and limited water flow, as shown in Photo 7 and Figure 1. Water levels were sufficient to overtop the sedimentation, resulting in limited flow. Standing water was observed in the internal swale and low-lying area to the north, as shown in Photo 8 and Figure 1.
- It was noted during previous Inspections that there was limited elevation difference available within the northeast corner of the perimeter ditch. As such, there is minimal ability to lower the base of ditch and maintain flow to the East Surface Water Pond.
- The east perimeter ditch was damp to dry between the OLA and the Clean Bin Storage Area, with high water levels noted south toward the East Surface Water Pond. A minor sheen was observed on surface water at the north end of the east access road.
- The previously noted flow break in the south ditch (the result of wildlife activity - specifically beavers), located at the Gate 6 access bridge, has been removed. As shown in Photo 9, water levels were moderate to high, with limited observed flow.
- Higher water levels were identified in the central portion of the south ditch with no observed flow, due to high water levels downstream, as well as sedimentation and accumulation of loose vegetation in the southwest corner of the perimeter ditch, impeding flow of water toward the West Surface Water Pond. A clear picture of the blockage could not be obtained due to dense vegetation.
- A previously identified seep in the southern portion of future Cell 19-2 was observed during the Inspection, outside of the active landfilling area. The seep contained orange and black staining and was observed. Temporary berms have been constructed and maintained to drain the seep into the base of Cell 19-1-3C.

4.2 East Surface Water Pond

The following provides a description of the status of the East Surface Water Pond (Photo 10):

- Water levels within the East Surface Water Pond were very high.
- No flow was observed entering the East Surface Water Pond.
- The pump at the East Surface Water Pond was in operation at the time of Inspection.

4.3 West Surface Water Pond

The following provides a description of the status of the West Surface Water Pond (Photo 11):

- Water levels within the West Surface Water Pond were moderate.
- No flow was observed entering the West Surface Water Pond.
- The pump at the West Surface Water Pond was in operation at the time of Inspection.

4.4 Equalization Pond

The following provides a description of the status of the Equalization Pond (Photo 12):

- Water levels within the Equalization Pond were very high. Flow was not observed entering the Equalization Pond at the time of Inspection.
- Cracking and sloughing of the concrete side walls of the Equalization Pond was observed during the Inspection. Additional sloughing was noted in several areas around the perimeter.
- Fish were not observed within the Equalization Pond.

5. Process Water Management System

The Process Water Management System consists of three ponds and a series of ditches and swales. The North Process Water Pond is located immediately west of the TDU area, the South Process Water Pond is located immediately south of the Incinerator, and the West Process Water Pond is located adjacent to the West Surface Water Pond. Water retained in the Process Water Management System is used as quench water for Site incineration operations.

5.1 Process Water Ditches and Swales

The following provides a description of the status of the process water ditches and swales:

- The process water ditch adjacent to the TDU area exhibited a high water level at the time of Inspection. This ditch was not being pumped at the time of Inspection. Erosion channels were observed immediately to the west, along the shoulder of the Landfill Container Compound access road.
- The ditches feeding the North Process Water Pond exhibited very high water levels, matching the level of the North Process Water Pond, as shown in Photo 13. Prior inspections identified sedimentation and culvert damage in these ditches, impeding flow and resulting in standing water within the ditches. It is recommended that sediment be removed and culvert(s) be repaired as necessary to promote drainage.
- Moderate to high water levels were observed in the small ditches near the South Process Water Pond at the time of the Inspection.

5.2 North Process Water Pond

The following provides a description of the status of the North Process Water Pond (Photo 14):

- The water level within the North Process Water Pond was very high, at the level of the ditch inlet.

- The pump at the North Process Water Pond was running at the time of the Inspection.
- During previous inspections, a significant washout was observed in the southeast corner of the North Process Water Pond. This washout was not visible at the time of inspection, due to high water levels.

5.3 South Process Water Pond

The following provides a description of the status of the South Process Water Pond (Photo 15):

- The water level within the South Process Water Pond was high.
- It was noted that this area is also receiving runoff from east of the active landfill area. Partial vegetative blockage of this drainage path was identified immediately east of the South Process Water Pond, limiting drainage of the undeveloped area adjacent to Cell 19-1.

5.4 West Process Water Pond

The following provides a description of the status of the West Process Water Pond, which is used for process water storage:

- The water level within the West Process Water Pond was very high.

6. Leachate Management System

The leachate reservoirs are designed to receive leachate from the active fill area and process areas. Leachate transferred from the active fill area is detained within the leachate reservoirs prior to transfer to the incinerator for disposal.

6.1 South Leachate Reservoir

The following provides a description of the status of the South Leachate Reservoir (Photo 16):

- The South Leachate Reservoir is equipped with a permanent floating cover. The South Reservoir is currently being used for leachate storage, with leachate pumped from the New Leachate Reservoir. The South Leachate Reservoir was nearly full.
- Clean Harbors maintains a record of the volume of leachate within the South Leachate Reservoir.

6.2 East Leachate Reservoir

The following provides a description of the status of the East Leachate Reservoir (Photo 17):

- The East Leachate Reservoir is equipped with a permanent floating cover. The East Reservoir is currently being used for leachate storage, but is not currently actively receiving leachate. The East Reservoir was nearly full.
- Clean Harbors maintains a record of the volume of leachate within the East Leachate Reservoir.

6.3 New Leachate Reservoir

The following provides a description of the status of the New Leachate Reservoir (Photo 18):

- The new Leachate Reservoir has been constructed immediately east of the East Leachate Reservoir and is equipped with a permanent floating cover. The new Leachate Reservoir is currently operational and is being used for leachate storage, based on observation of the cover. Leachate is being pumped from this Reservoir to the South Leachate Reservoir as required. The new Leachate Reservoir is nearly full.
- Clean Harbors maintains a record of the volume of leachate within the New Leachate Reservoir.

6.4 Leachate Storage Tank and Pumping System

The following provides a description of the status of the Leachate Storage Tank and Pumping System:

- The Leachate Storage Tank is in operation, serving as the feed tank to the incinerator.

7. Waste Processing Operations

The following provides a description of the Waste Processing Operations:

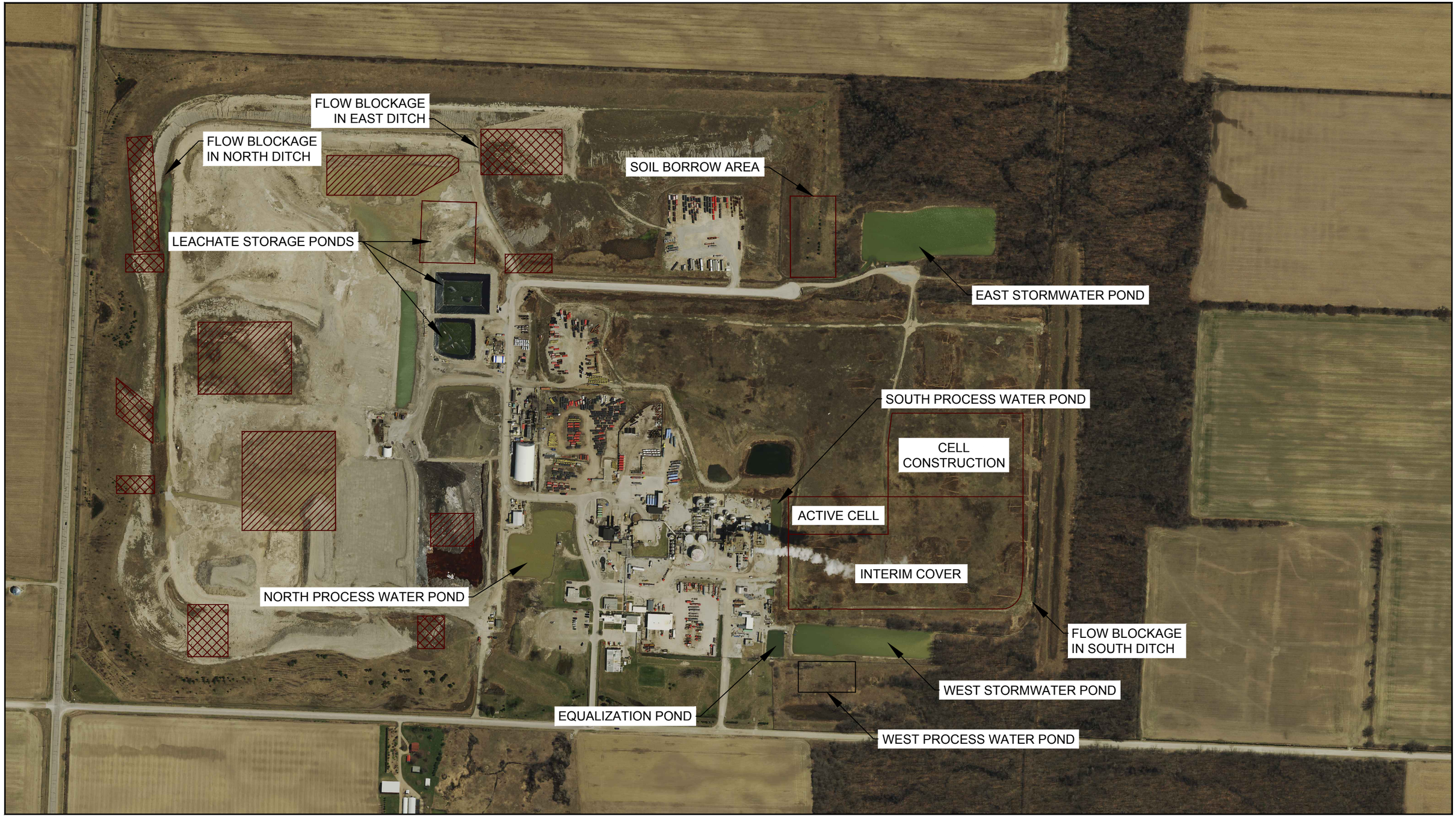
- Odour was noted in the vicinity of the incinerator and the active landfilling operations in Cell 19-1-3A, likely originating from the active landfilling area.
- A slight odour was noted within the TDU area.
- Identified odours were not identified beyond Site boundaries.

8. Conclusions and Recommendations

Interim cover work has been completed in the northern area of the Site. As such, the former stockpile area and other areas in the north that have periodic standing water are scheduled to be assessed and re-graded to promote drainage.

Maintenance of the perimeter ditches is required to remove areas where sediment has accumulated and is restricting flow of water. Maintenance of the perimeter ditches is a key component to minimize standing water on the interim cover and promote transfer of water to surface water ponds. It is recommended that perimeter ditch maintenance be undertaken to remove blockages as noted. The maintenance work should minimize the potential for flooding during storm events.

Portions of the interior side of the perimeter screening berms have significant erosion. These areas should be assessed and corrected to minimize erosion into the perimeter ditches. Installation of reinforced ditches from the top of berm to the perimeter ditches may be a solution for these areas, as well as vegetation of the internal berm slopes.



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LEGEND:

LARGE EROSION CHANNELS

LARGE AREAS OF STANDING WATER

LAMBTON FACILITY
CLEAN HARBORS CANADA INC.
2018 FOURTH QUARTER SITE INSPECTION

SITE PLAN

44985-16

Dec 03, 2018

FIGURE 1

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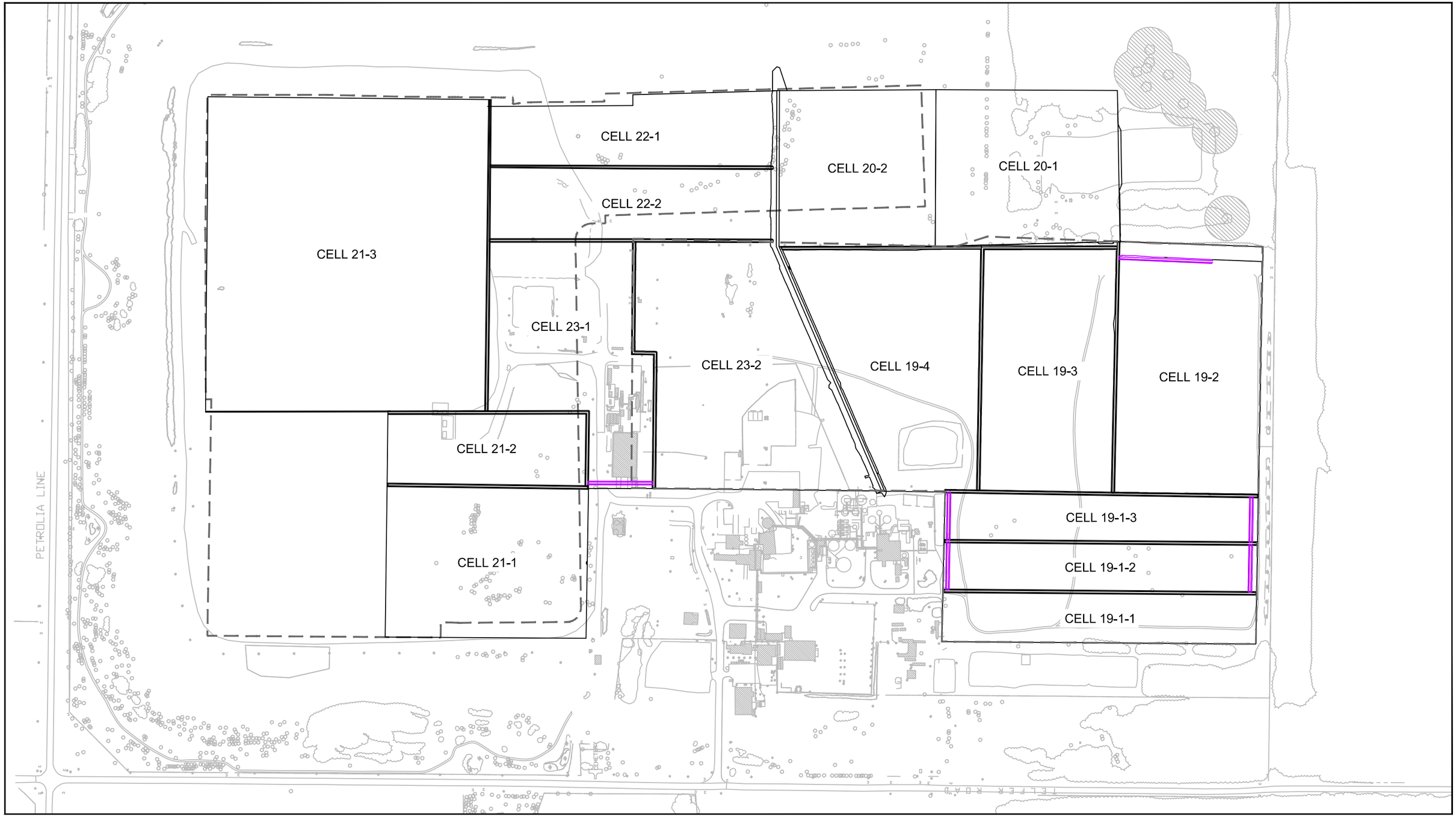

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LAMBTON FACILITY
CLEAN HARBORS CANADA INC.
2018 FOURTH QUARTER SITE INSPECTION

LANDFILL EXPANSION SUBCELL FILL EXPANSION PLAN

44985-16

Dec 03, 2018

FIGURE 2

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Attachment 1
Photographic Log

Photo 1 - Active landfilling cell (northern portion of Cell 19-1-3)

Photo 2 - Interim cap placement, Cells 19-1-1 and 19-1-2

Photo 3 - Standing water in northwest corner of Site

Photo 4 - Standing water in northern, central portion of Site

Photo 5 - High water levels in central portion of north perimeter ditch

Photo 6 - North ditch, surface water blockage

Photo 7 - North landfill area, southeast ditch, partial surface water blockage

Photo 8 - Standing water in southeast corner of north landfill area

Photo 9 - South ditch, surface water blockage removed

Photo 10 - East Surface Water Pond

Photo 11 - West Surface Water Pond

Photo 12 - Equalization Pond

Photo 13 - North Process Water Pond ditch

Photo 14 - North Process Water Pond

Photo 15 - South Process Water Pond

Photo 16 - South Leachate Reservoir

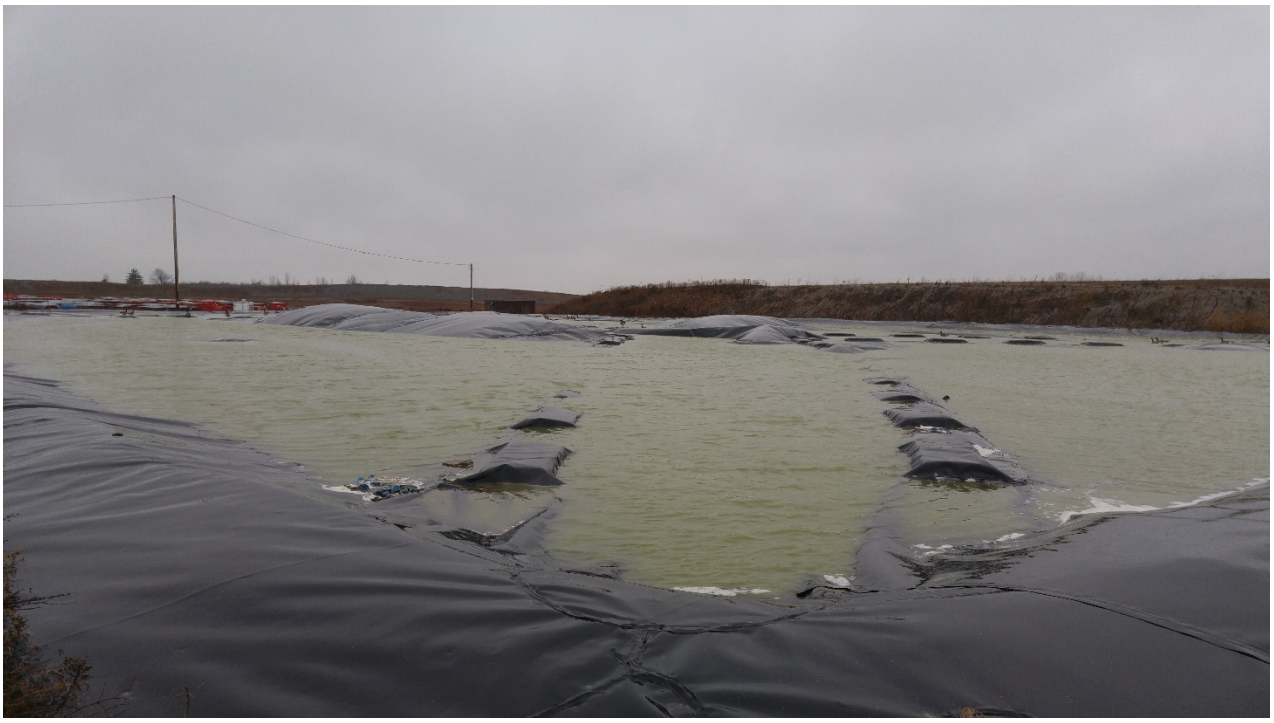

Photo 17 - East Leachate Reservoir

Photo 18 - New Leachate Reservoir

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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