ARCADIS Design & Consultancy for natural and built assets

Public Services and Procurement Canada

on behalf of

Department of National Defence

LONG-TERM LANDFILL MONITORING AT THE CAM-M FORMER DEW LINE SITE

Cambridge Bay, Nunavut

March 30, 2020

LONG-TERM LANDFILL MONITORING AT THE CAM-M FORMER DEW LINE SITE

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VERSION CONTROL

Issue	Revision No	Date Issued	Page No	Description	Reviewed by
1	0	18 Nov. 2019	all	Draft Monitoring Report; CAM-M	TA, RF, CG, RJ
2	1	27 Feb. 2020	all	Draft#2- Monitoring Report; CAM-M	TA, RF, CG, RJ
3	2	26 Mar. 2020	all	Draft#3- Monitoring Report; CAM-M	TA, RF, RJ
4	3	30 Mar. 2020	all	Final CAM-M Report	TA

Contents

TABLES (within text)

FIGURES (after listed page number)

APPENDICES

Separate Package:

CD ROM – Containing All Raw 2019 CAM-M Site Photographs

ACRONYMS AND ABBREVIATIONS

ATV	All-Terrain Vehicle
bgs	below ground surface
BOC	natural biogenic organic compound
DEW	Distant Early Warning
DGPS	Differential Global Positioning System
DND	Department of National Defence
GPS	Global Positioning System
HDPE	High Density Polyethylene
LRR	Long Range Radar
masl	metres above sea level
MDL	Method Detection Limit
MW	Monitoring Well
NWS	North Warning System
PCB	Polychlorinated Biphenyl
PHC	Petroleum Hydrocarbon
PSPC	Public Services and Procurement Canada
QA/QC	Quality Assurance/Quality Control
RMC	Royal Military College (Kingston)
RPD	Relative Percent Difference
SSR	Short-Range Radar
TOR	Terms of Reference
USAF	United States Air Force

EXECUTIVE SUMMARY

Public Services and Procurement Canada (PSPC) was engaged by the Department of National Defence (DND) to procure environmental services for the monitoring of Distant Early Warning (DEW) Line sites in Canada. PSPC acquired the services of Arcadis Canada Inc. (Arcadis) to perform the work and the management of the monitoring of DND DEW Line Sites (PIN-2, PIN-3, PIN-4, CAM-1, CAM-2, CAM-3, CAM-4, and CAM-M) in the Kitikmeot Region, Nunavut Settlement Area, for the years 2016 to 2020. This report documents the findings of the field program for the 2019 monitoring year conducted at the former DEW Line CAM-M site, located at Cambridge Bay, Nunavut.

The 2019 monitoring program took place between August 14 and 29, 2019 and included thermal monitoring (downloading data, battery change-out and reprogramming of thermistors installed in the Main Landfill North, Main Landfill South, and Tier II Soil Disposal Facility) in accordance with the Logistics and Work Plan monitoring program prepared by Arcadis for the CAM-M site, dated July 4, 2019. Added work scope was included for the CAM-M site by DND in 2019; which included geotechnical visual inspections (at South Shore Landfill, Tier II Disposal Facility and at Airstrip Landfill) as well as soil thermal conductivity monitoring in addition to preparation of a topographical survey of the South Shore Landfill.

The specific work activities completed by Arcadis staff in 2019 at CAM-M included the following:

i) Thermal monitoring related to thermistors installed in the Main Landfill North, Main Landfill South, and Tier II Soil Disposal Facility;

ii) Soil thermal conductivity testing at 12 test locations (shallow and deep monitoring required at each test location) using a KD2 testing unit (four locations at Main Landfill North; four locations at Main Landfill South; four locations at the Tier II Disposal Facility);

iii) Geotechnical visual inspections at the South Shore Landfill (including visual inspection of potential fuel spills at the adjacent tank farm and fuelling area);

iv) Topographical survey of the South Shore Landfill (as subcontracted by Arcadis to Inukshuk Surveying);

v) Geotechnical visual inspections at the Tier II Disposal Facility (at features B2 and N); and

vi) Geotechnical visual inspections at the Airstrip Landfill Area (at Areas 5, 9, 10, and 11 only).

The requirement for removal of bentonite within the groundwater monitoring well casings at Main Landfill North was removed from the 2019 work scope. This field update report outlines activities conducted at CAM-M Cambridge Bay in 2019.

The main observations and required actions for future monitoring events at the CAM-M site are shown below:

Landfill	Main Observations and Conclusions	Required Action for Future Monitoring Events
Airstrip Landfill (at Areas 5, 9, 10, and 11 only).	Landfill performance is acceptable. No stability issues were observed.	Continue environmental and geotechnical monitoring as per existing monitoring schedule
South Shore Landfill	Landfill performance is acceptable. No stability issues were observed.	Continue environmental and geotechnical monitoring as per existing monitoring schedule
Tier II Soil Disposal Facility	Landfill performance is acceptable at the limited Feature items which were inspected in 2019. Minor tension cracks and seepage were observed along the east toe of the landfill.	Continue environmental and geotechnical monitoring as per existing monitoring schedule

Visual inspections were completed at the South Shore Landfill for the presence of fuel spills or surface staining from petroleum hydrocarbons. No distinct areas of spills or staining were observed in August 2019 in the fuel transfer areas. No visual evidence of PHC spills were observed within the tank farm based on observations made from outside of the fenced compound. No soil or groundwater sampling for PHCs was conducted in 2019.

1 BACKGROUND

1.1 Context and Mandate

Public Services and Procurement Canada (PSPC) was engaged by Department of National Defence (DND) to procure environmental services for the monitoring of Distant Early Warning (DEW) Line sites in Canada. PSPC acquired the services of Arcadis Canada Inc. (Arcadis) to perform the work which included the management of the monitoring of DND DEW Line Sites (PIN-2, PIN-3, PIN-4, CAM-1, CAM-2, CAM-3, CAM-4 and CAM-M) in the Kitikmeot Region, Nunavut Settlement Area, for the years 2016 to 2020. This report documents the findings of the field program for the 2019 monitoring year conducted at the former DEW Line Site CAM-M, located at Cambridge Bay, Nunavut.

All 2019 monitoring field work was completed in accordance with the Logistics and Work Plan prepared by Arcadis for the CAM-M site, dated July 4, 2019.

1.1.1 Site Location

The CAM-M Cambridge Bay DEW Line site is located on the southern coast of Victoria Island at 69° 06’ 59” North latitude and 105° 07’ 10” West longitude; approximately three kilometres west of the Community of Cambridge Bay, NU.

CAM-M is accessible via commercial aircraft to Cambridge Bay, NU. Commercial accommodations are available in Cambridge Bay. The roads from the community to the CAM-M station and the access roads within the CAM-M station itself are maintained and allow the site to be accessed using pick-up trucks or other non-ATV vehicles.

Access to the CAM-M site was by commercial aircraft (Canadian North). The field team was based out of Cambridge Bay, NU for the duration of the field program. There were no on-site accommodations needed as Arcadis staff stayed at the Arctic Island Lodge in Cambridge Bay. A rental truck was secured from Kitnuna Corporation to access the site on a daily basis.

1.1.2 Background

CAM-M is a former main radar site on the DEW Line. The former main site was decommissioned and replaced by the North Warning System (NWS) in the early 1990s. As part of the CAM-M site conversion a Long Range Radar (LRR) and Logistical Support Site (LSS) was installed. The site is still active and manned year-round.

The DEW Line cleanup included the closure and remediation of existing landfills, the construction of an extension to an existing landfill for the disposal of non-hazardous wastes generated from demolition, and collection of site debris. A Tier II soil disposal facility was also constructed at this site to manage contaminated soils identified during the site decommissioning program.

1.1.3 Site Description and Site Features

The site is in a relatively low-lying area found approximately 18 metres above sea level with the landscape surrounding the CAM-M facility being generally flat and characterized by coarse grained (i.e. varying cobble, gravel and sand composition) esker ridges. The site is situated within the zone of continuous permafrost.

The terrain in the area of the site is generally defined by low lying thermokarsts, with numerous thaw lakes and water filled depressions. Nearly continuous vegetation cover, all less than 20 centimetres (cm) tall, can be found over most of the undisturbed areas of the site.

1.2 Logistics and Work Plan

Prior to mobilization, Arcadis prepared a Logistics and Work Plan, dated July 4, 2019, which was submitted and accepted by DND. The Logistics and Work Plan was used as a reference to guide the 2019 monitoring work completed at the CAM-M site. No environmental monitoring work (ie. soil and/or groundwater testing) was required to be done in 2019 at CAM-M; with the exception of the additional work scope related to soil thermal conductivity testing. A copy of the Work Plan was taken with the Arcadis field staff for on-site reference purposes. The Work Plan also included a copy of the Nunavut Water Board water use license.

The 2019 monitoring program took place between August 14 and 29, 2019 and included thermal monitoring (downloading data, battery change-out and reprogramming of thermistors installed in the Main Landfill North, Main Landfill South, and Tier II Soil Disposal Facility). Added work scope was included for the CAM-M site by DND in 2019; this included geotechnical visual inspections (at South Shore Landfill, Tier II Disposal Facility and at Airstrip Landfill) as well as soil thermal conductivity monitoring in addition to preparation of a topographical survey of the South Shore Landfill.

1.3 Objective

The objective of the DEW Line landfill monitoring program is to collect sufficient information to assess the performance, integrity, and stability of the landfills from an environmental and geotechnical perspective for human health and environmental protection. Furthermore, an additional objective of the program is to collect information, in accordance with the monitoring requirements outlined below in Section 1.4, in a thorough and consistent manner during each monitoring event.

PSPC has specified the requirements for the Landfill Monitoring Program in the document entitled, *"Terms of Reference – DEW Line Landfill Monitoring Program – PIN-2 Cape Young, PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-M Cambridge Bay, CAM-1 Jenny Lind Island, CAM-3 Shepherd Bay, CAM-2 Gladman Point, Shepherd Bay, and CAM-4 Pelly Bay – DEW Line Sites, Kitikmeot Region, Nunavut, DND Project # KITIK 16",* dated November 2015. Specifically, Section 3 of the TOR outlined the study objectives in detail. The monitoring schedule for CAM-M is detailed in Table 1-1 below:

Table 1-1: Monitoring Schedule – CAM-M Cambridge Bay

No. of Years After Construction	Monitoring Event No.	Year of Monitoring Event
1	1 + baseline	2001
2	2	2002
3	3	2003
4	4	2004
5	5	2005
6	6	2007
10	7	2010
15	8	2015
19*	8*	2019
25	9	2025

* monitoring event covered under the current contract. The 2019 event was considered a supplementary monitoring visit with a reduced work scope.

1.4 Scope of Work

The scope of work for the Long-Term Landfill Monitoring Program at CAM-M was defined in the TOR (in its Annex H) and in the accepted Arcadis proposal number P-6298 (Reference C – Section 1.9 herein) as submitted to PSPC. The scope of work includes the following activities itemized below:

A. Thermal monitoring (downloading data, battery change-out and reprogramming of thermistors installed in the Main Landfill North, Main Landfill South, and Tier II Soil Disposal Facility) in accordance with the Logistics and Work Plan monitoring program prepared for the CAM-M site. Five thermistors are installed at Main Landfill North (IT-N1, IT-N2, VT-1, VT-2, VT-3); four thermistors located at Main Landfill South (IT-S1, IT-S2, VT-4, VT-5); and four thermistors at the Tier II Disposal Facility (TA-1, TA-2, TA-3, TA-4).

B. Added work scope was included for the CAM-M site by DND in 2019. The specific additional work activities completed by Arcadis staff in 2019 at CAM-M included the following:

i) Soil thermal conductivity testing at 12 discrete test locations (shallow and deep monitoring required at each test location) using a KD2 testing unit (four locations at Main Landfill North; four locations at Main Landfill South; four locations at the Tier II Disposal Facility);

ii) Geotechnical visual inspections at the South Shore Landfill (including visual inspection for the presence of spills at the adjacent tank farm and fuelling area);

iii) Topographical survey of the South Shore Landfill (as subcontracted by Arcadis to Inukshuk Surveying);

iv) Geotechnical visual inspections at the Tier II Disposal Facility (at features B2 and N); and

v) Geotechnical visual inspections at the Airstrip Landfill Area (at Areas 5, 9, 10, and 11 only).

The requirement for removal of bentonite within the groundwater monitoring well casings at Main Landfill North was removed from the 2019 work scope.

Per the instructions of DND, all soil thermal conductivity monitoring photos and data were sent to the Royal Military College (RMC) contact directly. All soil thermal conductivity monitoring results were tabulated and included in the CAM-M Field Progress report, issued September 30, 2019. No duplication of the soil thermal conductivity monitoring data, photos or summary has been included in this CAM-M monitoring report. The KD-2 thermal conductivity measurement unit used for this field activity operated as expected with no issues encountered during the execution of the work and the unit was returned to RMC in good working order.

1.5 Site Geology, Hydrogeology and Hydrology

The CAM-M site is situated in a zone of continuous permafrost with medium to high ground ice content. As referenced on the map entitled, "*Geology of Nunavut*" (Canada-Nunavut Geoscience Office, 2006), the bedrock geology in the area of Cambridge Bay is identified as being Paleozoic undivided carbonate and siliciclastic rock. Based on field observations, the surficial geology at the CAM- M site consisted of weathered bedrock (where bedrock occasionally daylights at surface) overlain by coarse grained esker material consisting primarily of gravel to cobble deposits.

Groundwater flow is expected to be seasonal, occurring mainly in the summer period of maximum active permafrost layer thaw. Groundwater is located at shallow depths and is greatly influenced by local permafrost conditions. Surficial drainage at the site is localized to intermittent small ponded areas adjacent to the landfill features or local depressions in the surrounding terrain and varies between the respective landfill locations. Standing surface water (ponded water) was observed to the north of the Main Landfill North, to the north and east of the Tier II Disposal Facility and to the southeast of the Main Landfill South. Such low lying areas are interpreted to be permanent landform features.

1.6 Field Program Staff

The 2019 CAM-M DEW Line monitoring event was conducted by Arcadis qualified personnel with extensive experience in remote northern environments and at other DEW Line monitoring sites. The following personnel were present on site:

Arcadis Canada Scientific Team and Roles

- Troy Austrins, P.Eng. (TA) – Geotechnical Field Staff Lead
- Ryan Fletcher, C.Tech, EP (RF) – Environmental Field Staff Lead

Inuit Support Team and Roles (services arranged by Kitnuna Contracting) were as follows in 2019:

Staffing for both August 14 & 15, 2019

- Bradley Wingnek (labourer)
- Chad McCallum (wildlife monitor)
- Colin Crockatt (wildlife monitor)
- Dwayne Allukpik (labourer)

Staffing for August 24 or 29, 2019:

- David Kavanna (wildlife monitor) (24th August)
- Brandon Kavanna (labourer) (24 and 29th August)
- Ernest Mala (labourer) (24 and 29th August)
- Joe Jr Evetalegak (labourer) (29th August)
- Dwayne Allukpik (labourer) (29th August)
- Jimmy Evalik (wildlife monitor) (29th August)

1.7 Weather Conditions

Historical weather conditions for the CAM-M site are presented below. The 1971-2000 Climate Normal and Averages (temperature and precipitation totals) prepared by Environment Canada and Climate Change for Cambridge Bay are listed in Table 1-2 below.

Table 1-2: Summary of Historical Temperature and Precipitation Conditions (Cambridge Bay)

Climate Normals (1971- 2000)	Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Daily Maximum Temp (°C)	-29.3	-29.3	-25.7	-16.7	-5.3	5.6	12.3	9.4	1.9	-8.1	-19.3	-26.1
Daily Average Temp. (°C)	-32.8	-33	-29.7	-21.4	-9.2	2.4	8.4	6.4	-0.3	-11.5	-23	-29.6
Daily Minimum Temp. (°C)	-36.3	-36.6	-33.7	-26	-13	-0.8	4.6	3.4	-2.5	-14.9	-26.5	-33
Precipitation (mm)-rain	0	0	0	0.1	1.6	9.8	21.7	24.5	11.4	0.4	0	0
Precipitation (cm)-snow	5.6	6.4	7.4	7.5	9.3	2.8	0	2.2	8.9	16.2	9.3	6.3

An outline of the weather conditions encountered during the 2019 field work conducted by Arcadis is provided in Section 2.1.2. as well as on the individual Inspection Checklists for each landfill visited.

1.7.1 Additional Work in 2019

Additional work items were conducted as part of the 2019 work program, as outlined in Section 1.4 above.

1.7.2 Deviations from the TOR, Proposal, Work Plan, and/or Kick-off Meeting

Thermistor data downloading issues were encountered at the Main Landfill North (with VT-1 with Analog 7 not working). No other thermistor issues were encountered.

Challenges were encountered in discerning the boundaries of the South Shore Landfill as this site had been subject to significant regrading and new infrastructure (e.g. site access roads and fuelling stations). A new 2019 topographical survey had been commissioned for this site, but the survey results were not available at the time of the Arcadis site visit. The 2019 topographic survey results, however, have been used to create the updated site plan for the South Shore Landfill location.

Arcadis encountered difficulties in securing sufficient Inuit labourer assistance for the Saturday August 29, 2019 CAM-M field program as potential Inuit staff either did not respond, did not attend at the site or declined to participate.

Aside from the additional work detailed in Section 1.4 and the challenges noted above, no other deviations from the TOR, proposal, work plan, and/or kick-off meeting were reported during the execution of the field activities as part of the CAM-M 2019 monitoring program.

1.8 Project References

Project references include:

a) Terms of Reference, DEW Line Landfill Monitoring Program – PIN-2 Cape Young, PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-M Cambridge Bay, CAM-1 Jenny Lind Island, PIN-2 Cape Young, CAM-2 Gladman Point, and CAM-4 Pelly Bay – DEW Line Sites, Kitikmeot Region, Nunavut, DND Project # KITIK 16, November 2015. (Specifically, Annex H and Annex S)

b) Englobe Corp., The Collection of Landfill Monitoring Data at the Former CAM-M Distant Early Warning Line Site, Cambridge Bay, Nunavut, Final Report – 2015 (O/Ref.: CD2656) (Y/Ref.: DLCLFMP2(KITIK12), March 2016.

c) Arcadis Canada Inc., Proposal for Kitik 16 DEW Line Sites Monitoring, Response to Solicitation No. W6837-151003/B, March 8, 2016.

d) Arcadis Canada Inc., Record of Discussion, Meeting Minutes, Kitikmeot DEW Line Sites Monitoring May 2019 Kickoff Meeting, dated May 28, 2019 (revised 5 June 2019).

e) Arcadis Canada Inc., Logistics and Work Plan, 2019 Kitik16 DEW Line Site Monitoring (PIN-3, POIN-4, CAM-1, CAM-M), 4 July 2019.

f) Canada-Nunavut Geoscience Office, Geology of Nunavut Map, 2006.

g) Natural Resources Canada, Canada Permafrost Map, 1995.

1.9 Report Structure

This report describes the field work completed in August 2019 at the following CAM-M landfill locations;

- Main Landfill North (Thermal monitoring only);
- Main Landfill South (Thermal monitoring only);
- Tier II Soil Disposal Facility (Thermal and Visual monitoring for features B2 and N only);
- Airstrip Landfill (Visual monitoring for Areas 5, 9, 10, and 11 only);
- South Shore Landfill (Visual monitoring only).

Results from thermal and/or visual inspections of the respective landfills on site are presented in the formats described in the TOR (Reference A).

The report has been organized such that the results for each landfill are presented within a separate section as presented in Table 1-3 below:

Table 1-3: Report Structure by Landfill at CAM-M

Landfill Identification	Section Number	Analytical Tables	Associated Figure Numbers
Main Landfill North	3	None	CAM-M.2 (Thermal Monitoring)
Main Landfill South	4	None	CAM-M.3 (Thermal Monitoring)

Landfill Identification	Section Number	Analytical Tables	Associated Figure Numbers
Tier II Soil Disposal Facility	5	None	CAM-M.4A and -M.4B (Thermal and Visual Monitoring)
Airstrip Landfill	6	None	CAM-M.5.A and -M.5B (Visual Monitoring)
South Shore Landfill	7	None	CAM-M.6A, -M.6B and -M.6C (Topographical Survey and Visual Monitoring)

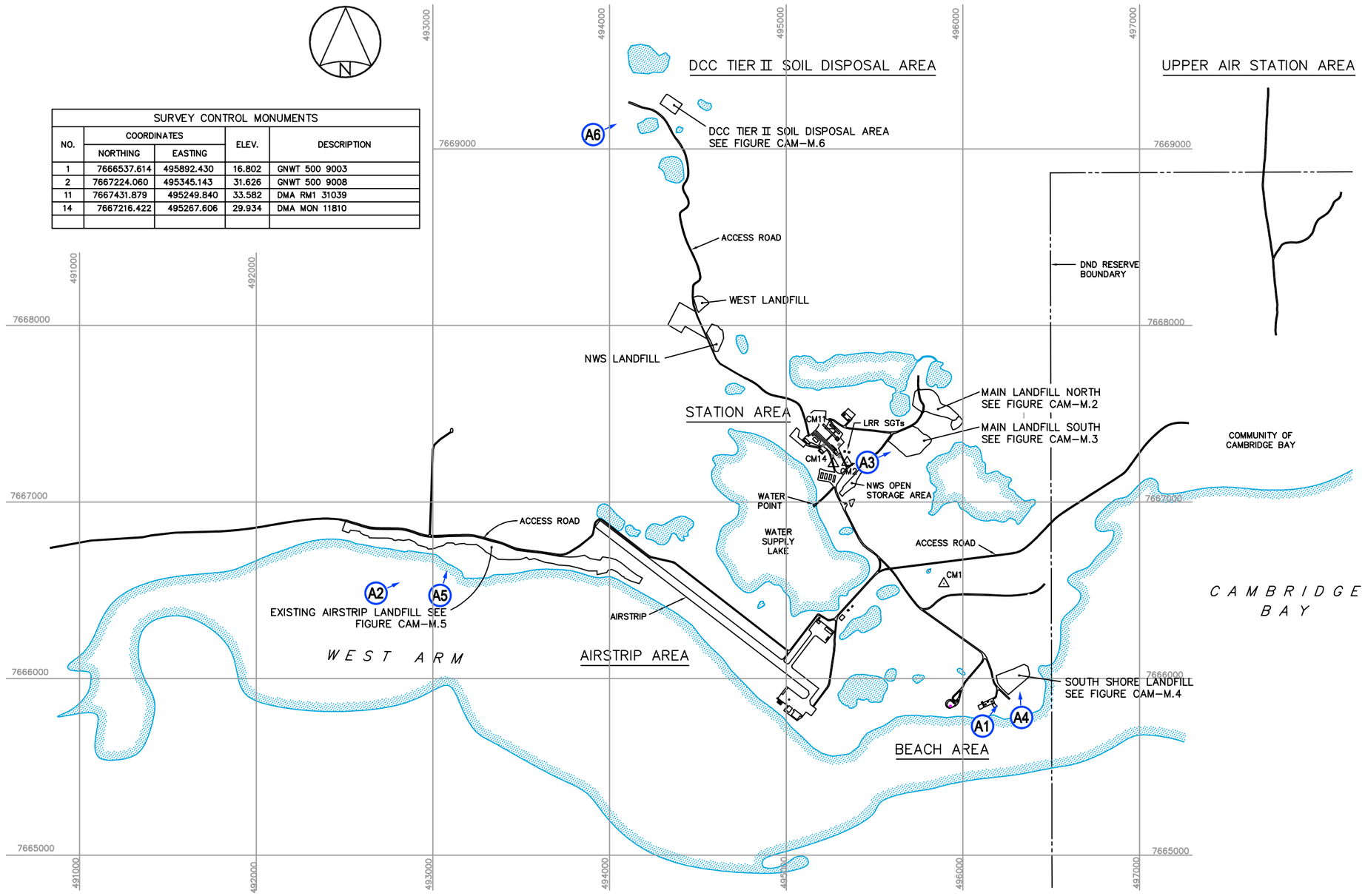
Where visual inspections were performed, all the relevant information for the respective landfill areas were logged on a Visual Inspection Checklist and supported by site photographs. Each of the individual landfill sections in this report include:

- A brief description of the landfill;
- A completed Visual Inspection Checklist;
- A Preliminary Stability Assessment;
- A discussion of all the visual inspection issues assessed;
- The overall performance rating of the landfill;
- A photo log sheet (as **Appendix E**);
- Annotated drawings of each landfill (in Figures section following main text);
- Completed thermistor inspection forms (if applicable);
- Analysis of overall performance of the landfill; and
- Any recommendations for further action and conclusions.

The photographic record for all CAM-M landfills is presented in **Appendix E**. The original photos are included in electronic format (.jpg) and are attached as a separate addendum CD/DVD-ROM to the report. An electronic version of the report and its component tables, figures and data files is included as a separate CD/DVD-ROM submittal to this report.

Field notes and completed checklists are attached in the applicable appendices.

SURVEY CONTROL MONUMENTS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
1	7666537.614	495892.430	16.802	GNWT 500 9003
2	7667224.060	495345.143	31.626	GNWT 500 9008
11	7667431.879	495249.840	33.582	DMA RM1 31039
14	7667216.422	495267.606	29.934	DMA MON 11810



LEGEND

- CM2 △ SURVEY CONTROL MONUMENT
- WATERBODY
- AX AERIAL PHOTOGRAPH

Meters
500 0 500 1000
1:25000

NO.	VERSION	DATE	BY	VERIF.	APPR.
3	FINAL	2020.03.26	RF	TA	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

OVERALL SITE PLAN

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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MEASUREMENT UNIT	SCALE	DATE REVISED/ISSUED
Metre	1 : 25,000	MARCH 2020
DRAWN BY	VERIFIED BY	APPROVED BY
R. FLETCHER	T. AUSTRINS, P. ENG	C. GRAVELLE, P. ENG
PROJECT NO.	DRAWING NO.	PAGE
30000251	3000251-CAM-M.1	PL

FIGURE CAM-M.1

2 APPROACH AND METHODOLOGY

2.1 Summary of Work

2.1.1 Health and Safety

Prior to mobilization to the site, a site-specific health and safety plan (SSHASP) was submitted and accepted by DND. The plan outlined the general safety rules and procedures that were adhered to while working at the site. It also presented additional precautions and procedures in the event of an emergency. Prior to commencing the field work, all project staff participating in the monitoring and assessment activities were required to familiarize themselves with the contents of the SSHASP and sign the Statement of Compliance document.

Field crews carried appropriate emergency gear and took every precaution to keep the crew safe. This included the following, where appropriate:

- Obtaining maps to assist in identifying/characterizing the dominant physical features near the site (e.g., topographic maps and aerial photographs);
- Carrying and knowing how to use emergency communication devices such as satellite phones and a Garmin InReach, which were tested for functionality and sufficient airtime prior to mobilization;
- Checking the weather prior to travel to the field;
- Compilation of a site-specific Emergency Contact List providing numbers for emergency services, office contacts, and individual emergency contacts;
- Carrying a Global Positioning System (GPS) unit for navigation as well as for relaying accurate location coordinates in case of emergency;
- Carrying a satellite phone in case emergency aid /communications were required;
- Possession of a Level 1 First Aid kit appropriate to the scope of work and number of personnel;
- Possession of an Emergency Field kit containing provisions necessary to survive (e.g. food, tarps, flares) should transport, or rescue services, not be possible for a number of days; and
- Knowing how to use all emergency equipment and testing it prior to mobilization to the field.

Bear monitors were employed during the CAM-M field work program to provide protection from wildlife safety concerns.

Arcadis staff received all relevant health and safety training in preparation for undertaking the work activities on-site prior to mobilization to the site. Arcadis ensured that all staff on site received a site safety orientation and field-specific training on contaminated sites, which was issued on Day 1 of the field program. The site safety orientation included specific details of the health and safety plan that were relevant for each job, and relevant training for each position.

2.1.2 Field Program

Arcadis staff mobilized to Cambridge Bay from Yellowknife on commercial flights, then to and from the CAM-M site each day via truck rented from Kitnuna Corporation (IFR0378) in Cambridge Bay. Accommodations while in Cambridge Bay were provided by Arctic Island Lodge (IFR#0194). No on-site accommodations were required for this CAM-M contract. The following Table 2-1 outlines the field schedule for CAM-M.

Table 2-1: 2019 Field Schedule for CAM-M Cambridge Bay (Arcadis)

August 2019						
		Tuesday	**Wednesday**	**Thursday**		
		13	14	15		
		Team 1 mobilizes to Cambridge Bay	Team 1- CAM-M geotechnical reviews + thermal monitoring	Team 1 - morning at CAM-M; then, mobilized to PIN-3		
	Friday	**Saturday**	**Sunday to Thursday**	**Friday**	**Saturday**	**Sunday**
	23	24	25 to 28	29	30	31
	Team 2- Arrive in Cambridge Bay from Yellowknife	CAM- M initial site visit + thermal monitoring	Off-site at CAM-1 (+ mobilization/ demobilization)	CAM- M geotechnical reviews + thermal monitoring	CAM-M site work completion	Demobilization back to Yellowknife

The topographical survey of the South Shore Landfill was completed by Inukshuk Surveying on August 27, 2019.

Weather during the field inspection and monitoring events consisted of a mixture of sun, clouds, light rain, and high winds. Temperatures typically ranged from 4 to 12 degrees Celsius. Details on the weather encountered on the respective geotechnical inspection dates are provided in Tables 5-1, 6-1 and 7-1.

2.1.3 Visual Inspection

Visual inspection of the Tier II, Airstrip and South Shore landfills was conducted by Mr. Troy Austrins, with assistance from Mr. Ryan Fletcher, based on the guidelines presented in Section 5.2 of the TOR. A visual inspection checklist (as was provided in Annex J1 of the TOR and reproduced herein for each individual landfill section) was completed for each landfill site inspected. Inspection information recorded for each

landfill included its designation, type, date, monitoring event number, weather conditions, and the name of the inspector. Observations related to the following potential site conditions were recorded for each landfill, which included the following items:

- Settlement; erosion; lateral movement; sloughing of slopes; cracks; frost action; animal burrows; vegetation re-establishment on surface; vegetation stress; staining; seepage points or ponded water; debris or liner exposure; condition of monitoring points; and any other relevant observations.

The presence of the above conditions was recorded along with their location (recorded with a Trimble R2 DGPS unit having sub-meter accuracy), dimensions, extent, and description.

Photographic records were taken to document the general condition of the landfill. Photographs were taken to substantiate recorded observations including where no concerns were identified. All photographs were referenced to existing monuments, where possible, and a 1 metre length measuring tape (with 1 cm marked intervals) or other marker (pylon cones with a 0.2 m diameter) was used as an indication of scale in the visual inspection photographs. Photographs were taken using a digital camera with an equivalent focal length of 5 to 24 mm and 16.4-megapixel resolution. A detailed sketch of each landfill showing the results of the inspection was created and later combined into AutoCAD along with the field collected DGPS data to create the site figures.

Historical features and conditions were noted from previous monitoring events. Existing features were compared to these features noted in previous monitoring reports and a comparative analysis is included in each landfill section within this report.

All thermistors were visually inspected with any damages noted along with repair requirements. Monitoring well inspections were not included in the 2019 scope of work. Photographic records of each thermistor location were also collected and are included in the photo log (Appendix E) of this report.

2.1.3.1 Stability Assessment

Arcadis used the following Performance/Severity rating reference guide for purposes of assessing the geotechnical performance of the landfill sites inspected and the extent of any features noted.

Performance / Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion or settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.

Performance / Severity Rating	Description
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement, • Liner exposed, and/or • Slope failure.
Extent	**Description**
Isolated	Singular feature.
Occasional	Features of note occurring at irregular intervals/locations.
Numerous	Many features of note impacting less than 50% of the surface area of the landfill.
Extensive	Impacting greater than 50% of the surface area of the landfill.

2.1.4 Environmental Sampling

Per the TOR and work plan requirements, no soil or groundwater environmental sampling was required at any of the CAM-M landfills in 2019 other than the request for additional work scope involving soil thermal conductivity monitoring/sampling, as described in Section 1.4 above. The soil conductivity testing results, photos and samples were sent directly to RMC and are not included as part of this report.

2.1.5 Thermal Monitoring

Thermal monitoring at the Main Landfill North, Main Landfill South, and at the Tier II Disposal Facility was completed concurrently with the other monitoring requirements. At each thermistor installation location, an updated (2019) Thermistor Annual Maintenance Report was completed (as provided by DND). Monitoring consisted of the following steps:

- Inspection of the condition of thermistor installations, noting their condition, damage if applicable, and any specific repair requirements;
- Retrieval (data collection) of ground temperature data from the thermistor installations. A personal computer equipped with the appropriate software and datalogger programming files to retrieve (download) the data was used.
- Collection of manual readings of thermistors using a digital readout that is compatible with the thermistors or a multimeter and switch box;
- Drawing a sketch to indicate the location of each cable;
- Manually reading, in real-time, the individual beads of each thermistor installation using an electronic multi-meter and Lakewood Systems switch box; and,

- Resetting datalogger memory to zero and restarting readings to occur every 48 hrs starting at noon. The system was monitored using the personal computer to ensure that the dataloggers were functioning and temperatures were being recorded.

Thermal monitoring data was retrieved from thirteen (13) CAM-M thermistor installations as specified in the TOR and shown below in Table 2-2.

Table 2-2: Summary of Thermal Monitoring at CAM-M

DEW Line Site	Landfill	Thermistor ID	Observations/Notes
CAM-M Cambridge Bay	Main Landfill North	VT-1	Analog 7 not working. No other issues encountered.
		VT-2	No issues encountered.
		VT-3	No issues encountered.
		IT-N1	No issues encountered.
		IT-N2	No issues encountered.
CAM-M Cambridge Bay	Main Landfill South	IT-S1	No issues encountered.
		IT-S2	No issues encountered.
		VT-4	Analog 8 not working; satisfactory as this thermistor is designed to only have beads 1-7. No other issues encountered
		VT-5	Analog 8 not working; satisfactory as this thermistor is designed to only have beads 1-7. No other issues encountered
CAM-M Cambridge Bay	Tier II Soil Disposal Facility	TA-1	No issues encountered.
		TA-2	No issues encountered.
		TA-3	No issues encountered.
		TA-4	No issues encountered.

Thermistor inspection reports are provided in **Appendix B** and raw field notes taken during the thermistor inspections are provided in **Appendix D** for reference purposes.

2.2 Field Notes and Data Collection

2.2.1 Field Notes

Field notes were collected utilizing the field forms provided in the TOR, namely the Visual Inspection Checklist (using TOR annex J template), as updated by DND in 2018. In addition, field notes regarding thermistor inspections were recorded on the field form provided as Annex M – Thermistor Inspection Template (as updated by DND in 2018). A copy of the field notes is provided in **Appendix D**.

2.2.2 Data Collection

The visual inspection of the respective landfills was conducted with the aid of a Trimble R2 Differential Global Positioning System (DGPS) unit to locate features of note and to collect GIS information to be used in report preparation. The horizontal accuracy of the measurements taken with the DGPS unit ranged between 0.2 and 1.0 m, with most results falling within the 0.2 and 0.5 m accuracy range. DGPS data was tied into local site controls, including the eight existing monitoring wells, four existing thermistor installations and benchmark CM1 (as shown on Figure CAM-M.1). A detailed data dictionary (Trimble file) was created prior to the site visit to capture all required information as outlined in the long-term monitoring plan. An SSF file and the data dictionary (Trimble files) are included on the appended CD/DVD ROM to be used in future site investigations.

Placement of features of note on the figures for each landfill was completed using the DGPS information, supplemented by visual observations and field take-off measurements. Small differences in feature locations may be, unless otherwise noted, a result of the use of the more accurate DGPS data as compared to locations based on previous inspections that used less accurate GPS data.

Thermistor data was downloaded onto a personal computer from dedicated dataloggers on the site. This data is provided in its raw form, as well as in Excel format on the appended CD/DVD ROM.

3 CAM-M: MAIN LANDFILL NORTH

3.1 Landfill Description

The Main Landfill North is a leachate-contained landfill located east of the main station facilities. The remediation for this landfill included the installation of a double synthetic liner system anchored into the permafrost-rich soils located beneath the toe of the landfill. In addition, 1.5 m of coarse-grained granular fill was placed on the surface of the landfill and 1.8 m of fill was added above the liner along the landfill toe to cause permafrost aggradation through the landfill contents.

The long-term monitoring plan for the Main Landfill North consists of visual monitoring, the collection of soil and groundwater samples to evaluate the effectiveness of the leachate containment system, and the monitoring of sub-surface ground temperatures along the toe and in the main body of the landfill.

A supplemental monitoring event (with reduced scope) had been added to the planned monitoring schedule under this contract for 2019. The scope was limited to thermal monitoring, battery replacement and reprogramming of the dataloggers. In 2019, no repair attempt was required for two of the monitoring wells (MW-4 and MW-5) which were found to be filled with bentonite in 2015 and could no longer be sampled as a result of the bentonite obstruction.

The landfill layout is presented on **Figure CAM-M.2,** located at the rear of this Section.

3.2 Summary of Work Conducted

3.2.1 Visual Inspection

Per the 2019 Work Plan, no visual inspection was completed on the CAM-M Main Landfill North site.

3.2.2 Soil Sampling

Soil environmental sampling was not required in 2019 at the Main Landfill North site based on the TOR. Soil thermal conductivity testing was undertaken in 2019 by Arcadis at this landfill. Photos, samples and thermal conductivity test results were sent directly to RMC for review and analyses.

3.2.3 Groundwater Sampling

Per the Work Plan, no groundwater sampling or analysis was required in 2019.

3.2.4 Thermal Monitoring

Five thermistors (IT-N1, IT-N2, VT-1, VT-2, and VT-3) are present at the Main Landfill North. Each of the thermistor installations was inspected and data downloaded from the data loggers as per Section 5.4 of the TOR. Dataloggers were reprogrammed to take readings at noon after every 48hr period. Updated (2018) thermistor inspection reports were filled out for each of the installations.

3.3 Results of the Monitoring Program

3.3.1 Visual Inspection

No visual inspection was completed on the Main Landfill North site in 2019.

3.3.2 Environmental Soil and Groundwater Sampling

No environmental soil or groundwater sampling was completed at the Main Landfill North site in 2019.

3.3.3 Thermal Monitoring

As per Section 5.4.3 of the TOR, thermistor inspection logs were filled out for each of the respective thermistors and the records provided in **Appendix B**.

Raw thermistor data from the 2019 monitoring session was sent to DND for reference and review as part of the CAM-M draft Field Progress report. No analyzed thermistor data was provided to Arcadis to date for inclusion into the 2019 monitoring report.

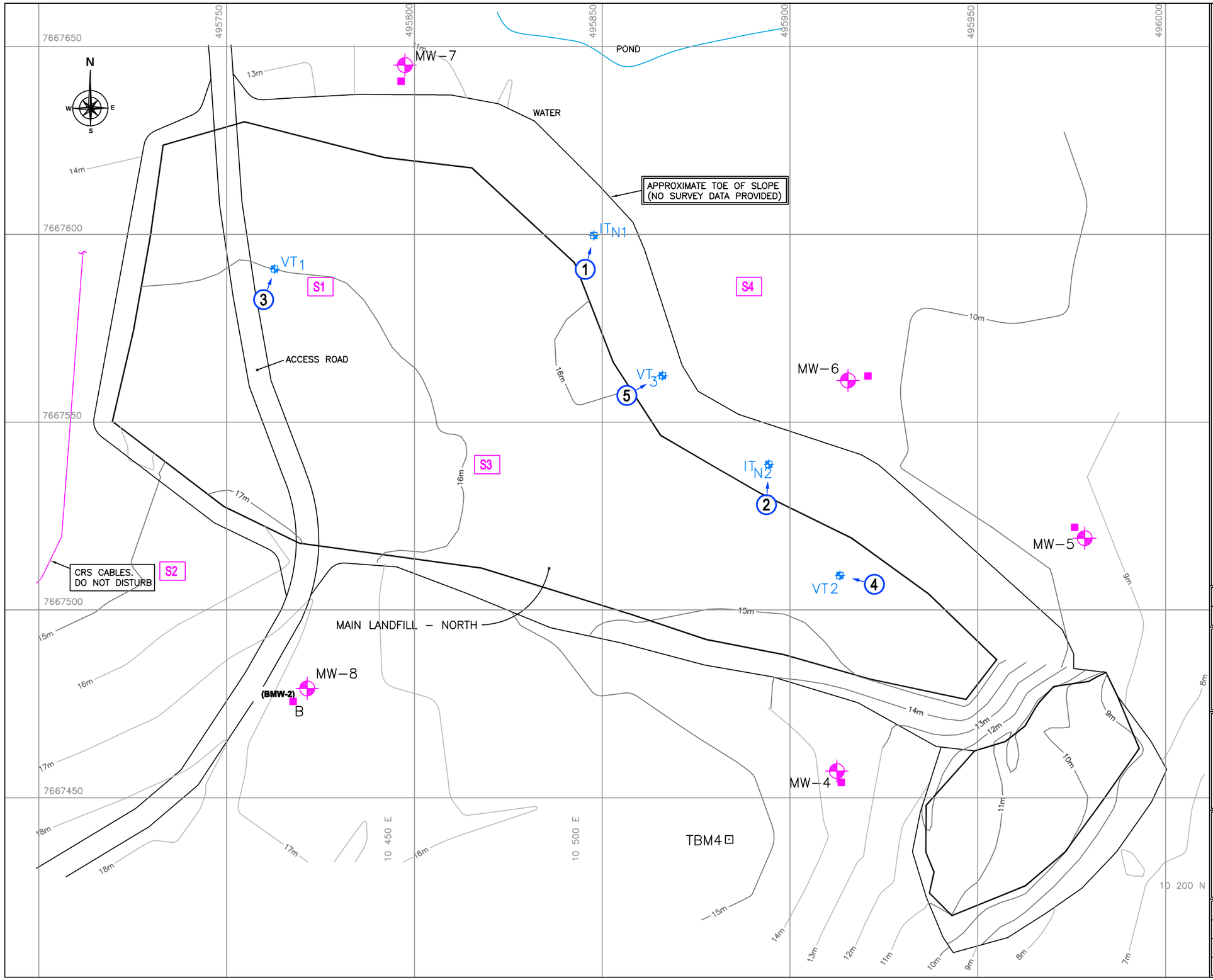
3.4 Conclusions and Overall Landfill Performance

Per the 2019 Work Plan, no soil/groundwater sampling or visual monitoring was conducted at the Main Landfill North as part of the 2019 program.

3.5 Recommendations

In the absence of updated 2019 soil and groundwater results, it is recommended that the long-term monitoring of environmental site conditions continue as planned.

No detailed visual inspection of the CAM-M Main Landfill North was conducted as part of the 2019 program; hence, the recommendations previously provided during earlier monitoring events remain unchanged.



LEGEND

- TBM4 — TEMPORARY BENCHMARK
- MONITORING WELL LOCATION
- MONITORING SOIL SAMPLE LOCATION
- VT — VERTICAL THERMISTOR LOCATION
- IT — INCLINED THERMISTOR LOCATION
- 2 — APPROXIMATE PHOTOGRAPH LOCATION AND PHOTO NUMBER
- S11 — THERMAL CONDUCTIVITY SOIL TEST LOCATIONS, 2019

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COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

MAIN LANDFILL NORTH

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Metre	1:1000	MARCH 2020
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PROJECT NO: 30000251	DRAWING NO: 30000251-CAM-M.2	PAGE PL

FIGURE CAM-M.2

4 CAM-M: MAIN LANDFILL SOUTH

4.1 Landfill Description

The Main Landfill South is a leachate-contained landfill located east of the main station facilities, southwest of the Main Landfill North. The remediation for this landfill included the installation of a double synthetic liner system anchored into the permafrost-rich soils located beneath the toe of the landfill. In addition, 1.5 m of coarse-grained granular fill was placed on the surface of the landfill and 1.8 m of fill was added above the liner along the landfill toe to cause permafrost aggradation through the landfill contents.

The long-term monitoring plan for the Main Landfill South consists of visual monitoring, the collection of soil and groundwater samples to evaluate the effectiveness of the leachate containment system, and the monitoring of sub-surface ground temperatures along the toe and in the main body of the landfill.

A supplemental monitoring event (with reduced scope) had been added to the planned monitoring schedule under this contract for 2019. The scope was limited to thermal monitoring, battery replacement and reprogramming of the dataloggers.

The landfill layout is presented on **Figure CAM-M.3,** which is provided at the rear of this Section.

4.2 Summary of Work Conducted

4.2.1 Visual Inspection

Per the 2019 Work Plan, no visual inspection was required in 2019 at the Main Landfill South site.

4.2.2 Soil Sampling

Per the 2019 Work Plan, soil sampling was not required in 2019 at the Main Landfill South site. Soil thermal conductivity testing was undertaken in 2019 by Arcadis at this landfill. Photos, samples and thermal conductivity test results were sent directly to RMC for review and analyses.

4.2.3 Groundwater Sampling

No groundwater sampling or analysis was required in 2019.

4.2.4 Thermal Monitoring

Four thermistors (IT-SI, IT-S2, VT-4, and VT-5) are present at the Main Landfill South. Each of the thermistor installations was inspected and data downloaded from the data loggers as per Section 5.4 of the TOR. Dataloggers were reprogrammed to take readings at noon after every 48hr period. Updated (2018) thermistor inspection reports were filled out for each of the installations

4.3 Results of the Monitoring Program

The following Sections 4.3.1 through 4.3.3 summarize the results of the CAM-M monitoring program at the Main Landfill South.

4.3.1 Visual Inspection

No visual inspection was completed on the Main Landfill South site in 2019.

4.3.2 Soil and Groundwater Sampling

No environmental soil or groundwater sampling was completed at the Main Landfill South site in 2019.

4.3.3 Thermal Monitoring

As per Section 5.4.3 of the TOR, thermistor inspection logs were filled out for each thermistor and are provided in **Appendix B**.

Raw thermistor data from our 2019 monitoring session was sent to DND for reference and review as part of the CAM-M draft Field Progress report. No analyzed thermistor data was provided to Arcadis to date for inclusion into the 2019 monitoring report.

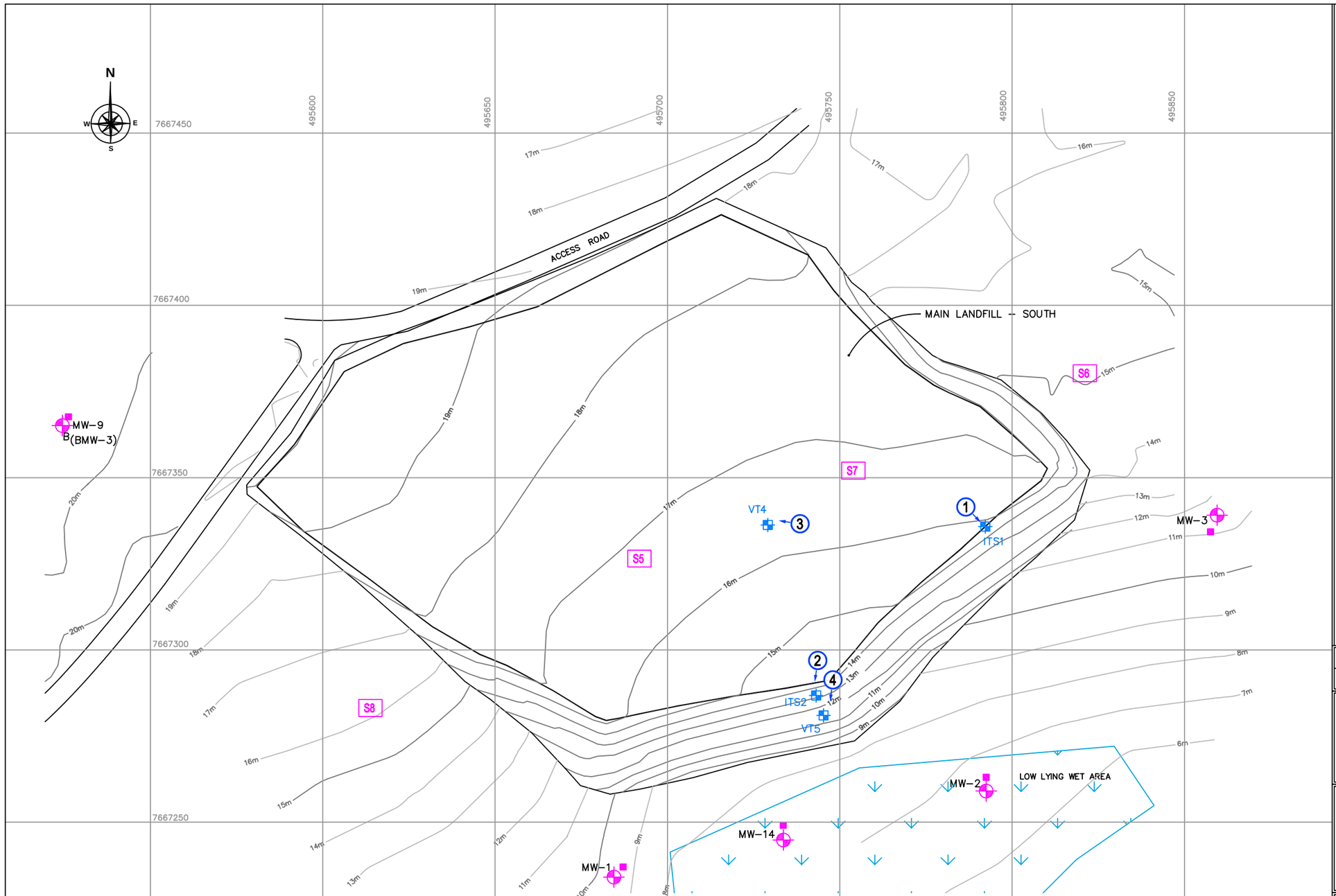
4.4 Conclusions and Overall Landfill Performance

As no sampling or visual monitoring was conducted at the Main Landfill South, no conclusions can be drawn regarding the overall performance of the Main Landfill South.

4.5 Recommendations

In the absence of updated 2019 soil and groundwater results, it is recommended that the long-term monitoring of environmental site conditions continue as planned.

No detailed visual inspection of the CAM-M Main Landfill South was conducted. No remedial work or deviations from the monitoring plan are recommended at this time.



LEGEND

- TBM4 — TEMPORARY BENCHMARK
- MONITORING WELL LOCATION
- MONITORING SOIL SAMPLE LOCATION
- VT — VERTICAL THERMISTOR LOCATION
- IT — INCLINED THERMISTOR LOCATION
- WET AREA
- 2 — APPROXIMATE PHOTOGRAPH LOCATION AND PHOTO NUMBER
- S11 — THERMAL CONDUCTIVITY SOIL TEST LOCATIONS, 2019

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3	FINAL	2020.03.26	RF	TA	CG

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COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

MAIN LANDFILL SOUTH

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MEASUREMENT UNIT	SCALE:	DATE (month–year):
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PROJECT NO:	DRAWING NO.	PAGE
30000251	30000251-CAM-M.3	PL

FIGURE CAM-M.3

5 CAM-M: TIER II SOIL DISPOSAL FACILITY

5.1 Landfill Description

A Tier II Soil Disposal Facility was constructed at the CAM-M Site for the disposal of Tier II soil excavated during the decommissioning and remediation of the former DEW Line site facilities. The location of the Tier II Soil Disposal Facility is approximately two kilometers northwest of the Station Area (see Figure CAM-M.1). Landfill design consists of a liner system along the base of the landfill, up along the berms, and over the landfill surface, as well as the placement of an additional 1.4 m of granular fill over the liner at surface, and 2.0 m of granular fill along the landfill toe. The thickness of fill was designed to promote aggradation of permafrost through the landfill contents.

Monitoring of the Tier II Soil Disposal Facility consists of visual monitoring for evidence of settlement, erosion, differential movement, collection of soil and groundwater samples from around the facility to monitor the effectiveness of the containment system and monitoring of sub-surface ground temperatures within the landfill containment berms and to confirm aggradation of permafrost within the impacted soils contained within the main body of the disposal facility.

The landfill layout, visual observations, thermistor locations and photographic locations are presented on **Figure CAM-M.4,** located at the rear of this Section. In 2019, visual monitoring was conducted only at the previously defined Tier II Disposal Facility site features B2 and N; as observed during the course of the 2015 field visual monitoring program.

5.2 Summary of Work Conducted

5.2.1 Visual Inspection

Per the work plan, visual inspection of the Tier II Disposal Facility site was limited to Features B2 and N only. Visual inspection details are listed in Section 5.3 below.

5.2.2 Soil Sampling

Per the 2019 Work Plan, no environmental soil sampling was completed at the Tier II Disposal Facility as part of the 2019 monitoring program. Soil thermal conductivity testing was undertaken in 2019 by Arcadis at this landfill. Photos, samples and thermal conductivity test results were sent directly to RMC for review and analyses.

5.2.3 Groundwater Sampling

Per the Work Plan, no groundwater sampling or analysis was performed in 2019.

5.2.4 Thermal Monitoring

Four thermistors (TA-1, TA-2, TA-3, and TA-4) are present within the limits of the Tier II Soil Disposal Facility. Each of the thermistor installations was inspected and data downloaded from the data loggers as

per Section 5.4 of the TOR. Dataloggers were reprogrammed to take readings at noon after every 48hr period. Updated (2018) thermistor inspection reports were filled out for each of the installations.

5.3 Results of the Monitoring Program

The following Section summarizes the results of the CAM-M visual inspection/monitoring program completed at the Tier II Soil Disposal Facility in 2019. Reference should also be made to **Figure CAM-M.4A** (2019 visual monitoring observations) and **Figure CAM-M.4B** (2019 & 2015 observations).

5.3.1 Visual Inspection

The visual inspection of the Tier II Disposal Facility was conducted on August 29, 2019. The visual inspection was completed as per the TOR and the Visual Inspection Checklist is included as Table 5-1 herein.

Table 5-1: Visual Inspection Checklist – Tier II Disposal Facility

SITE NAME: CAM-M (Cambridge Bay)
LANDFILL DESIGNATION: Tier II Disposal Facility LANDFILL TYPE: Tier II DATE OF INSPECTION: 29 August 2019 WEATHER CONDITIONS: partly cloudy (winds from North at 12 km/h) ~5 degrees C
DATE OF PREVIOUS INSPECTION: 22 August 2015
INSPECTED BY: Troy Austrins, P.Eng.
REPORT PREPARED BY: Troy Austrins, P.Eng. The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Note- Visual inspection of the Tier II Disposal Facility site was to be limited to Features B2 (Tension Crack at east corner of landfill) and N (Seepage at north corner of landfill). Minor erosion features (Feature I-Erosion) found immediately upgradient to Feature N were reviewed to assess their impact and potential contribution to the seepage although no association was observed. During the 2019 field inspection, new and existing features were observed which were related to Features B2 and N. The two seepage points for Feature N were labelled as sub-features N1 and N2.

New in 2019 Feature N3 (Seepage) was added to the visual inspection as an additional toe of slope seepage was observed at the northeast landfill slope. These seepage Features were considered to be caused by seepage from within the landfill, and not as a result of any event external to the landfill (such as ponding of overland runoff or precipitation/melt water).

In addition, new in 2019 Feature B2B (Tension Crack) was added to the visual inspection checklist as this crack was leading towards and is likely associated with the larger Feature B2 (Tension Crack) at this east corner of the Tier II landfill. Feature B, formerly referred to as minor erosion, was re-classified as a Tension Crack in 2019. It was considered that Features B, B2 and B2B are all associated with each other.

Table 5-1: Visual Inspection Checklist – Tier II Disposal Facility

Checklist Item	Present (Yes/No)	Feature ID	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	NA		Not reviewed- not part of 2019 work scope									NA	
Erosion	NA		Not reviewed – not part of 2019 work scope and not associated with Feature N (seepage points)									NA	
Lateral Movement	NA												
Frost Action	NA												
Sloughing	NA												
Cracking	Yes	B	SE corner at base of slope	494427.124; 7669246.117	13 N	15	0.2	0.1	<1%	Tension crack near toe of landfill slope	Formerly termed 'minor erosion'. Now classified as a Tension Crack- similar to 2010 findings	Acceptable	T2- 15
Cracking	Yes	B2	SE corner at base of slope	494431.705; 7669256.970	13 N	9	0.2	0.2	<1%	Tension crack near toe of landfill slope	No Significant Change (only 1m greater in length in 2019 vs. 2015)	Acceptable	T2- 15, -16, -17
Cracking	Yes	B2B	SE corner on slope; on side slope	494423.856; 7669250.054	13 N	6	0.1	0.1-0.2	<1%	Diagonally placed tension crack on side slope leading towards Feature B2	New	Acceptable	T2-18, -19
Animal Burrows	NA												
Vegetation Establishment	Yes								30%	Sparse vegetation across Tier II landfill;	Very similar to 2015 observations	Acceptable	T2- 11, -17
Staining	NA												
Vegetation Stress	NA												
Seepage Points (or) Ponded Water	Yes	N1 N2	North side slope; west end	494355.093; 7669318.965 494370.335; 7669303.316	13 N	1 – 1.2	0.15-0.2-	-	322 m2	2 landfill seepage points (the 2015 northern 2 seepage points were not observed); 322 m2 moist area	Only two seepage points observed - moist area at toe of slope remains; algae growth noted in isolated areas.	Acceptable (seepage from landfill)	T2- 9, -10, -11
Seepage Points (or) Ponded Water	Yes	N3	North side slope; east end	494407.450; 7669285.360	13 N	1 – 1.2	0.15-0.2-	-	57 m2	57 m2 moist area associated with one Feature N3 seepage point	NEW- moist area/ seepage point at toe of slope associated with Feature N3; excess water draining towards the east.	Acceptable (seepage from landfill)	T2- 14
Debris and/or Liner Exposed	No												
Presence & Condition of Monitoring Instruments	Yes	N/A	Four thermistors on landfill cover							TA1, TA2, TA2, TA4	All thermistors in good condition in 2019.	Acceptable	T2- 20, -21, -22, -23
Features of Note/Other Relevant Observations (e.g., signs of activity)	No												

5.3.1.1 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Tier II Disposal Facility was conducted on August 29, 2019 as per the TOR; specifically directed to Features B2 and N, and any associated features. As such, an overall preliminary landfill stability assessment was not completed as there is insufficient information to complete the overall landfill performance evaluation in 2019.

5.3.1.2 Photographic Records

The detailed photographic record for the Tier II Disposal Facility has been completed (as per Section 5.5 of the TOR) and is included as **Appendix E**. The Photographic Record contains an index of photographs collected; full sized photographs are contained in the appended CD/DVD-ROM. **Figures CAM-M.4A and CAM-M.4B** illustrates the photograph locations and viewpoint directions.

5.3.2 Soil and Groundwater Sampling

No environmental soil or groundwater sampling was complete at the Tier II Disposal Facility in 2019.

5.3.3 Thermal Monitoring

As per Section 5.4.3 of the TOR, thermistor inspection logs were filled out for each thermistor and are provided in **Appendix B**.

Raw thermistor data from our 2019 monitoring session was sent to DND for reference and review as part of the CAM-M draft Field Progress report. No analyzed thermistor data was provided to Arcadis to date for inclusion into the 2019 monitoring report.

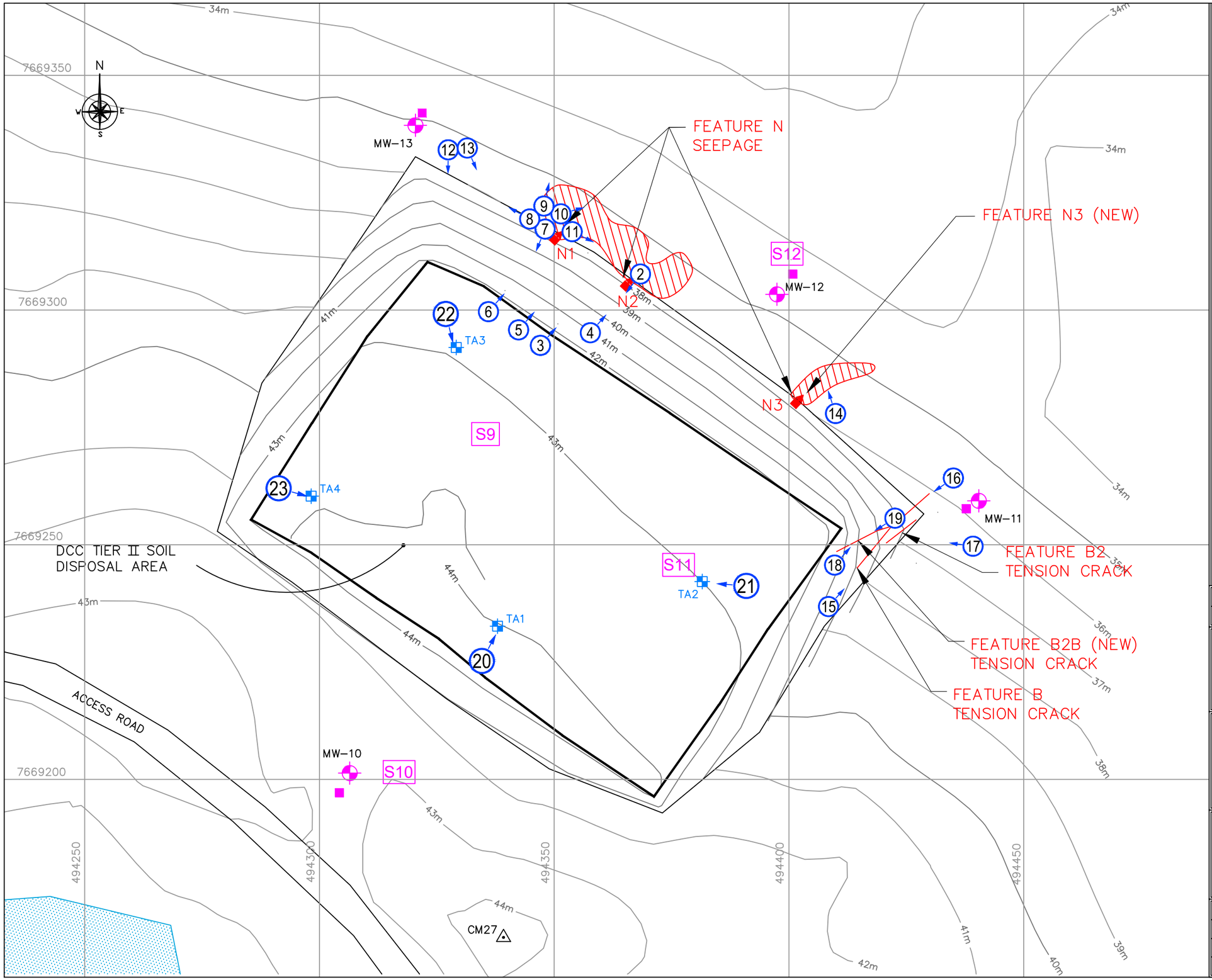
5.4 Conclusions and Overall Landfill Performance

Based on the results of the 2019 visual inspection and monitoring program, the performance of the Tier II Disposal Facility features inspected (namely Features B2 and N as well as related features) is acceptable.

5.5 Recommendations

In the absence of updated 2019 soil and groundwater results, it is recommended that the long-term monitoring of environmental site conditions continue as planned.

Based on the results of the visual inspection occurring at Features N and B2, the Tier II Disposal Facility performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.



LEGEND

- TBM4 — TEMPORARY BENCHMARK
- MONITORING WELL LOCATION
- MONITORING SOIL SAMPLE LOCATION
- VT — VERTICAL THERMISTOR LOCATION
- 2 — APPROXIMATE PHOTOGRAPH LOCATION AND PHOTO NUMBER
- S11 — THERMAL CONDUCTIVITY SOIL TEST LOCATIONS, 2019
- MOIST AREAS
- SEEPAGE POINT
- TENSION CRACK

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COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

TIER II LANDFILL VISUAL INSPECTION 2019

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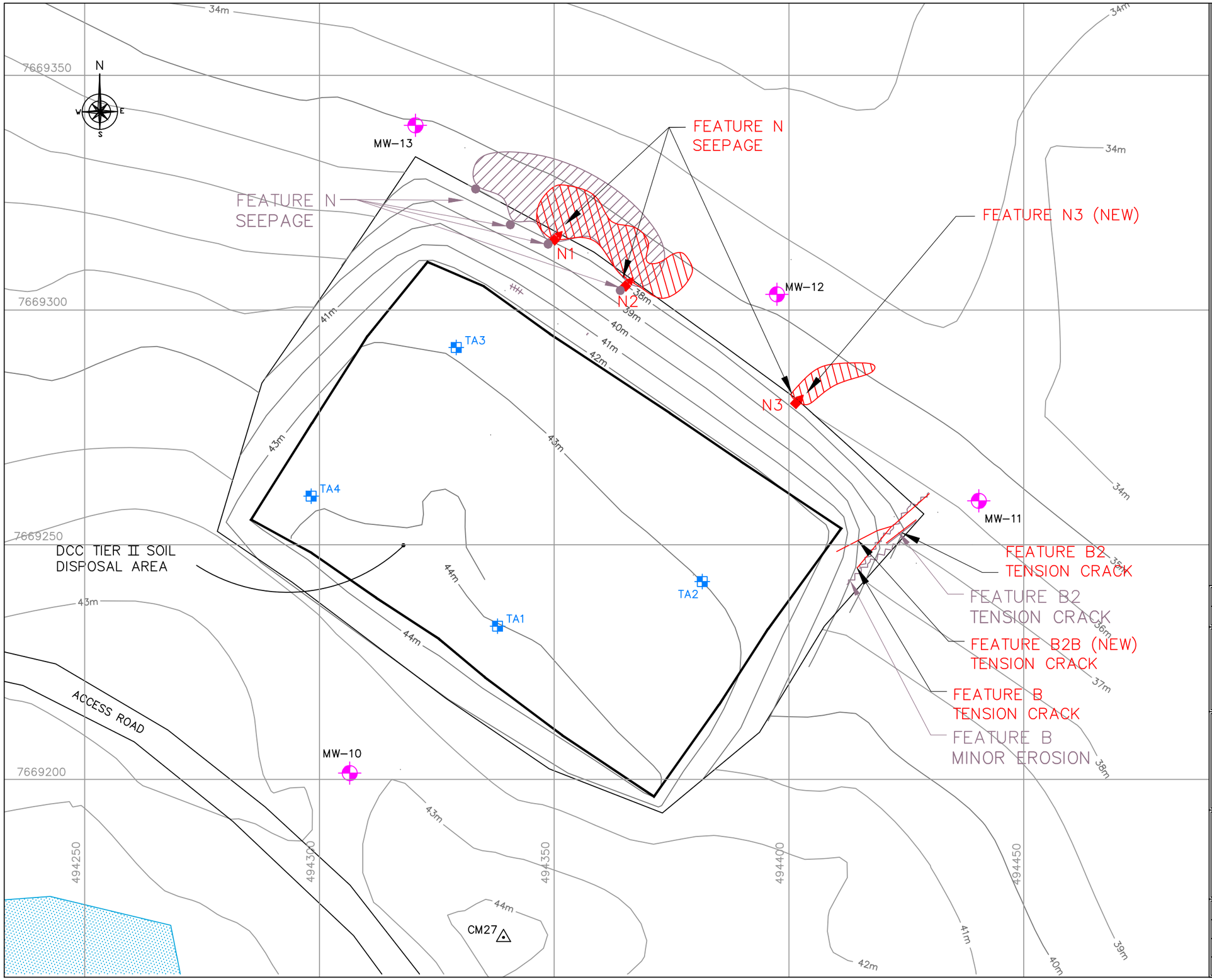
FIGURE CAM-M.4A



LEGEND

- TBM4 — TEMPORARY BENCHMARK
- MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR LOCATION
- IT — INCLINED THERMISTOR LOCATION
- MOIST AREA
- EROSIONAL FEATURE
- SEEPAGE POINT – 2019
- TENSION CRACK

APPROXIMATE 2015 OBSERVATIONS
(TO ILLUSTRATE CHANGES)

- PONDING
- EROSIONAL FEATURE
- SEEPAGE POINT – 2015

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COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

TIER II LANDFILL VISUAL INSPECTION 2015 & 2019

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FIGURE CAM-M.4B

6 CAM-M: AIRSTRIP LANDFILL

6.1 Landfill Description

The Airstrip Landfill is located southwest of the Cambridge Bay airport airstrip, along the edge of the West Arm of Cambridge Bay (see Figure CAM-M.1). The disturbed area associated with this landfill extends along the gravel road over a length of two kilometers. Visual observations and geophysical surveys of the area have shown that waste materials are buried in discrete lobes across this full distance. Surface debris, prior to cleanup, covered an extensive area and included domestic and industrial type wastes. The depth of the landfill material within the buried lobes of material is inferred to be in the order of one to two meters.

The remediation of this landfill included: removal of surface debris (completed in 1998), excavation of Tier I and II contaminated soils, removal of pockets of buried materials that were associated with contaminated areas, and regrading of fill placed over residual pockets of buried material.

In 2019, monitoring of the Airstrip Landfill consisted of visual inspections for evidence of settlement, erosion and differential movement at Areas 5, 9, 10, and 11 only.

The landfill layout, visual observations and photographic locations are presented on **Figures CAM-M.5A and CAM-M5B** located at the rear of this Section.

6.2 Summary of Work Conducted

6.2.1 Visual Inspection

Per the work plan, visual inspection of the Airstrip Landfill site was limited to areas 5, 9, 10, and 11 only. Visual inspection details are listed in Section 6.3 below.

6.2.2 Soil Sampling

Per the Work Plan, no soil sampling was completed at the Airstrip Landfill as part of the 2019 monitoring program.

6.2.3 Groundwater Sampling

Per the Work Plan, no groundwater sampling or analysis was performed at the Airstrip Landfill as part of the 2019 monitoring program.

6.2.4 Thermal Monitoring

No thermistors are present at the Airstrip Landfill in Areas 5, 9, 10, and 11; hence, thermal monitoring was not conducted in 2019 at this landfill location.

6.3 Results of the Monitoring Program

The following Section summarizes the results of the CAM-M visual inspection/monitoring program completed at the Airstrip Landfill in 2019. Reference should also be made to **Figure CAM-M.5A** and **Figure CAM-M.5B**.

6.3.1 Visual Inspection

The visual inspection of the Airstrip Landfill was conducted on August 29, 2019. The visual inspection was completed as per the TOR and the visual inspection checklist is included as Table 6-1 below.

Table 6-1: Visual Inspection Checklist – Airstrip Landfill

SITE NAME: CAM-M (Cambridge Bay)
LANDFILL DESIGNATION: Airstrip Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 29 August 2019 WEATHER CONDITIONS: overcast/ cloudy (winds from North at 26 km/h) ~4 degrees C
DATE OF PREVIOUS INSPECTION: 23 August 2015
INSPECTED BY: Troy Austrins, P.Eng.
REPORT PREPARED BY: Troy Austrins, P.Eng. The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

The two stockpiles observed to the north of Area 11 (as documented in photos AIRS-30 and AIRS-31) were inferred to be located beyond landfill Area 11 and were likely as a result of excavation occurring beyond landfill limits.

Table 6-1: Visual Inspection Checklist – Airstrip Landfill (Areas 5, 9, 10, 11 only)

Checklist Item	Present (Yes/No)	Feature ID	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	No												
Erosion	Yes	V	Erosion Channel (Area 11)	493281.755; 7666773.493	13N	5	0.3-0.5	0.05-0.15	<1%	Minor erosion	No Significant Change	Acceptable	Airs -25, -26
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	Yes	D1 to D4=Sparse vegetation	Areas 5, 9, 10, 11	none	13N	-	-	-	<1%	Very sparse vegetation; isolated grass tufts	No Significant Change from 2015 visual observations	Acceptable	Airs- 3, -4, -5, -6, -16, -19, --21, -22, -32, -33, -29, -30
Staining	No												
Vegetation Stress	No												
Seepage Points (or) Ponded Water	No												
Seepage Points (or) Ponded Water	No												
Debris and/or Liner Exposed	No												
Presence & Condition of Monitoring Instruments	No												
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	Feature U1 (Area 5)	Area 5 Landfill	492904.899; 7666822.650	13N	17	1-2	0.3	<1%	Excavated drainage channel S. of gravel road	No Significant Change from 2015 visual observations; drain channel not in contact with landfill	Acceptable	Airs- 1, -2
Features of Note	Yes	Feature U2 (Area 9)	Area 9 Landfill	493101.815; 7666809.945	13N	25	0.3-0.8	0.1-0.3	<1%	Excavated drainage channel S. of gravel road	No Significant Change from 2015 visual observations; drain channel not in contact with landfill	Acceptable	Airs- 12, -14

6.3.1.1 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Airstrip Landfill (Areas 5, 9, 10, 11 only) was conducted on August 29, 2019 as per the TOR and the results are provided below in the Table below.

Table 6-2: Preliminary Stability Assessment – Airstrip Landfill (Areas 5, 9, 10, 11 only)

Feature	Severity Rating	Extent
Settlement	Not Observed	None
Erosion	Acceptable	Isolated
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Isolated
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Acceptable	Occasional (drainage channels)
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

6.3.1.2 Photographic Records

The detailed photographic record for the Airstrip Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix E**. The Photographic Record contains an index of photographs collected; full sized photographs are contained in the appended CD/DVD-ROM. **Figure CAM-M.5B** illustrates the photograph locations and viewpoint directions.

6.3.2 Soil and Groundwater Sampling

No environmental soil or groundwater sampling was complete at the Airstrip Landfill in 2019.

6.3.3 Thermal Monitoring

No thermistors were present at the Areas subject to visual inspection in 2019.

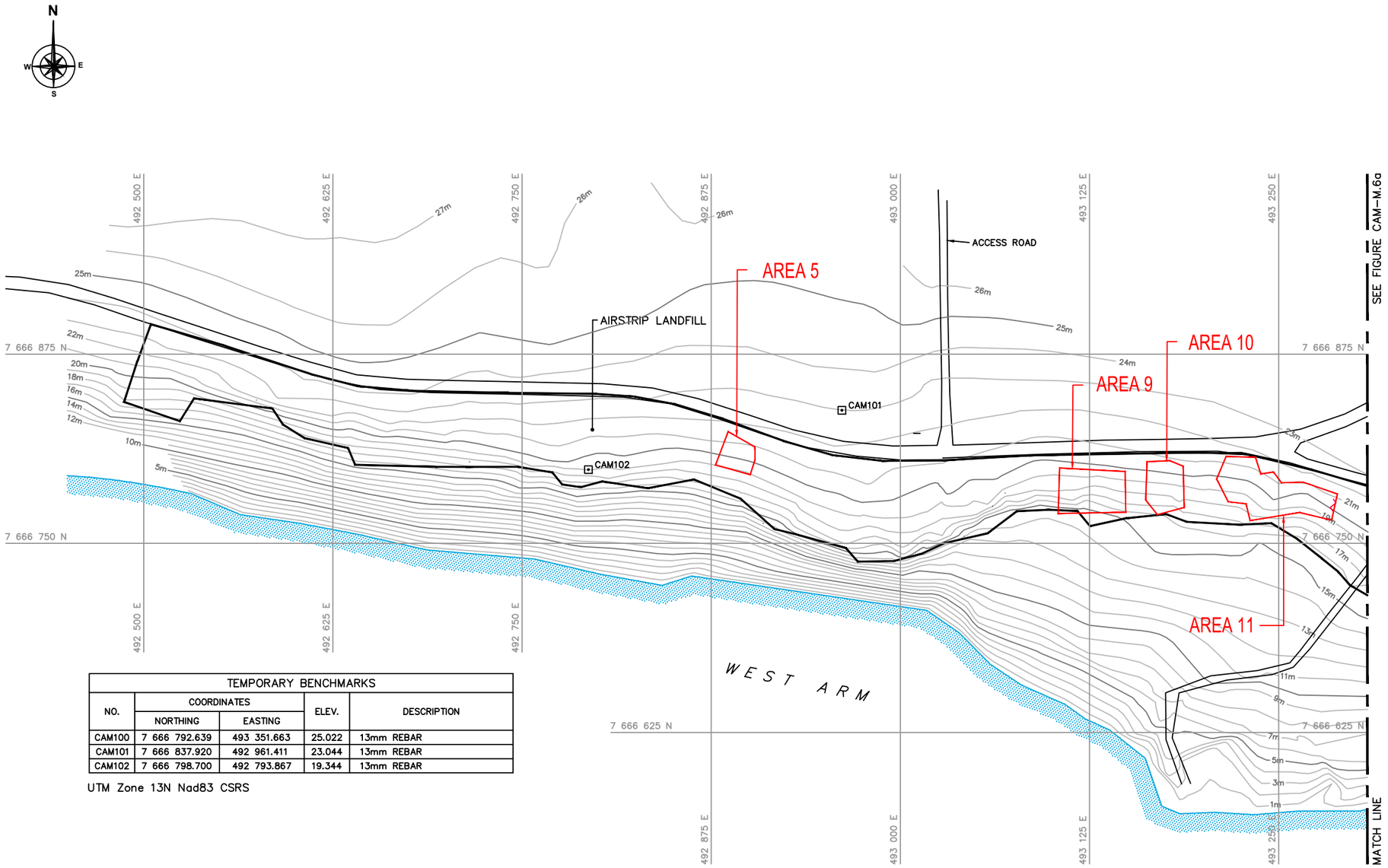
6.4 Conclusions and Overall Landfill Performance

Based on the results of the 2019 monitoring program, the overall performance of the Airstrip Landfill is acceptable for the Areas inspected.

6.5 Recommendations

In the absence of updated 2019 soil and groundwater results, it is recommended that the long-term monitoring of environmental site conditions continue as planned.

Based on the results of the visual inspections at Areas 5, 9, 10, and 11, the Airstrip Landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.



TEMPORARY BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CAM100	7 666 792.639	493 351.663	25.022	13mm REBAR
CAM101	7 666 837.920	492 961.411	23.044	13mm REBAR
CAM102	7 666 798.700	492 793.867	19.344	13mm REBAR

UTM Zone 13N Nad83 CSRS

LEGEND

CAM101 ⊡ TEMPORARY BENCHMARK (NOT VERIFIED IN 2019)

AREAS INSPECTED IN 2019

0m 30m 60m 90m 120m 150m

NO.	VERSION	DATE	BY	VERIF.	APPR.
3	FINAL	2020.03.26	RF	TA	CG

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COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

AIRSTRIP LANDFILL OVERVIEW

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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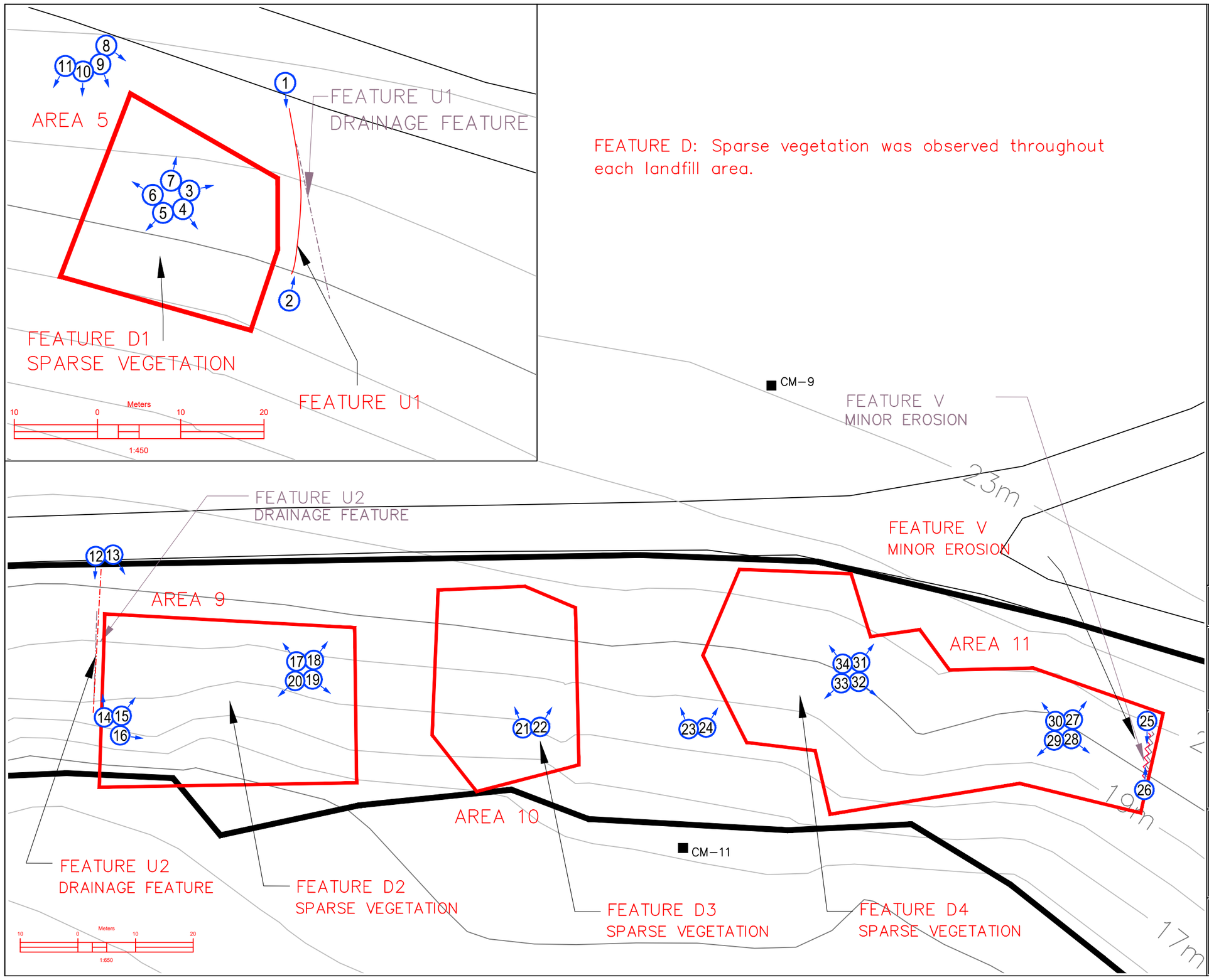
MEASUREMENT UNIT	SCALE	ORIGINAL ISSUE DATE
Metre	1:3000	MARCH 2020
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS P. ENG	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 30000251	DRAWING NO: 30000251-CAM-M.5A	PAGE: PL

FIGURE CAM-M.5A



LEGEND

- CAM101 — TEMPORARY BENCHMARK
- MONITORING SOIL SAMPLE LOCATION
- APPROXIMATE PHOTOGRAPH LOCATION AND PHOTO NUMBER
- DRAINAGE FEATURE
- APPROXIMATE AREAS OF INTEREST
- EROSION

APPROXIMATE 2015 OBSERVATIONS (TO ILLUSTRATE CHANGES)

- DRAINAGE FEATURE
- EROSIONAL FEATURE

NO.	VERSION	DATE	BY	VERIF.	APPR.
3	FINAL	2020.03.26	RF	TA	CG

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COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

AIRSTRIP LANDFILL AREAS 5, 9, 10, & 11

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MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 3,000	MACH 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	T. AUSTRINS P. ENG	C. GRAVELLE P. ENG
PROJECT NO:	DRAWING NO:	PAGE
30000251	30000251-CAM-M.5B	PL

FIGURE CAM-M.5B

7 CAM-M: SOUTH SHORE LANDFILL

7.1 Landfill Description

The South Shore Landfill is located approximately two kilometers south of the main facilities and is found near the POL Beach Staging area (see **Figure CAM-M.1**). This landfill encompasses an area of 20,000 m^2 with an estimated 1.5 m depth of waste and soil cover, however it is understood that portions of the landfill site may contain less debris.

In August 2015, the Community of Cambridge Bay commenced construction of a new bulk tank farm immediately south of the South Shore Landfill (see **Figures CAM- M6A, M6B and M6C**). A portion of the site development, including the fuel dispensers and operations shelter, were constructed on the south side of the landfill. Based on observations made in 2015, the landfill cover was used for storage and staging of construction materials for the new tank farm with fencing materials and lubricants stockpiled at the east end of the landfill cover. Numerous heavy truck tracks and ruts were observed across the landfill cover during the 2015 site inspection. Two areas of construction waste were also observed on the south cover area of this landfill location.

The long-term monitoring plan at the South Shore Landfill consists of visual inspections for signs of settlement/ disturbance and periodic collection of soil samples to monitor for the presence of leachate. The landfill layout, 2019 visual observations and photographic locations are presented on **Figures CAM-M.6A to M6C**, located at the rear of this Section.

In 2019, visual monitoring was conducted across the South Shore Landfill. Challenges were encountered in discerning the boundaries of the South Shore Landfill as this site had been subject to significant regrading and installation of new infrastructure (e.g. new/upgraded access roads and fuelling stations). In order to obtain better topographic information and define the new limits of the landfill, a topographical survey was commissioned by DND for completion during the 2019 field season.

As part of the additional work program for this site, Arcadis supplied DND with an updated topographical survey for the South Shore Landfill, completed by Inukshuk Geomatics Inc. in August 2019. The geodetic survey was completed in a 10 m by 10 m maximum grid spacing. The survey equipment used for this survey work was a Leica Captivate RTK system (two-unit system consisting of a base and rover). Accuracy was better than 10 mm in the horizontal direction and 20 mm in the vertical direction and survey points were tied into existing CAM-M control points; with control monument points identified and coordinates issued in the UTM system. The base mapping has been completed using 500 mm contours. Final deliverables were provided to DND and included the raw AutoCAD and .pdf topographical drawings.

7.2 Summary of Work Conducted

7.2.1 Visual Inspection

Visual inspection of the South Shore Landfill was executed; however, given the amount of regrading that has occurred at this landfill location, none of the reference points remained from the previous 2015 visual observations. Visual inspection details are listed in Section 7.3 below.

Visual inspections were completed at the South Shore Landfill for the presence of fuel spills or surface staining from petroleum hydrocarbons. No distinct areas of spills or staining were observed in August 2019 in the locations around the fuel transfer pumps and associated infrastructure. No visual evidence of PHC spills were observed within the tank farm based on observations made from outside of the fenced compound. No soil or groundwater sampling for PHCs was conducted.

7.2.2 Soil Sampling

Per the 2019 Work Plan, no soil sampling was completed at the South Shore Landfill.

7.2.3 Groundwater Sampling

Per the Work Plan, no groundwater sampling or analysis was performed in 2019.

7.2.4 Thermal Monitoring

No thermistors are present at this landfill and, as such, no thermal monitoring was executed at this landfill location.

7.3 Results of the Monitoring Program

The following Section summarizes the results of the CAM-M visual inspection/monitoring program completed at the South Shore landfill in 2019.

7.3.1 Visual Inspection

The visual inspection of the South Shore landfill was conducted on August 29, 2019. The visual inspection was completed as per the TOR and the visual inspection checklist is included as Table 7-1 of this report herein. A reproduction of the topographical survey for this landfill is provided as **Figure CAM-M.6A**. Reference should also be made to **Figure CAM-M.6B** (2019 visual monitoring observations) and **Figure CAM-M.6C** (2019 & 2015 observations).

Table 7-1: Visual Inspection Checklist – South Shore Landfill

SITE NAME: CAM-M (Cambridge Bay)
LANDFILL DESIGNATION: South Shore Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 29 August 2019 WEATHER CONDITIONS: overcast/ cloudy (winds from North at 26 km/h) ~4 degrees C
DATE OF PREVIOUS INSPECTION: 22 August 2015
INSPECTED BY: Troy Austrins, P.Eng.
REPORT PREPARED BY: Troy Austrins, P.Eng. The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 7-1: Visual Inspection Checklist – South Shore Landfill

Checklist Item	Present (Yes/No)	Feature ID	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)			Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	No	F	Not observed									Not observed in 2015 or in 2019		Not observed in 2019
Settlement	No	G	Not observed									Not observed in 2015 or in 2019		
Erosion	No													
Lateral Movement	No													
Frost Action	No													
Sloughing	No													
Cracking	No													
Cracking	No													
Animal Burrows	No													
Vegetation Establishment	No													
Staining	No													
Vegetation Stress	No													
Seepage Points (or) Ponded Water	No	Feature J	East of landfill-ponded water								Ponded water	Not observed in 2019		Not observed in 2019
Seepage Points (or) Ponded Water	Yes	Feature O	Middle of landfill-ponded water	496286.842	7665996.752	13N	54	22	0.05	5%	Ponded water (often in areas of tire rutting). Water depth of 0.2 m inside tire ruts.	New	Acceptable	SSL- 64
Debris and/or Liner Exposed	No	D1 & D2	Not observed								Metal debris (crushed drums)	Not observed in 2019. Area entirely re-graded.		Not observed in 2019
Debris and/or Liner Exposed	No	E	Not observed								Steel cable protruding from cap	Not observed in 2015 or in 2019		Not observed in 2019
Debris and/or Liner Exposed	No	I	Not observed								Exposed cables	Not observed in 2019		Not observed in 2019
Debris and/or Liner Exposed	No	L	Not observed								Exposed geotextile	Not observed in 2019		Not observed in 2019
Debris and/or Liner Exposed	Yes	Feature N	Middle E end of Landfill toe	496385.512;	7666053.280	13N	0.7	0.05	NA	<1%	Large diameter embedded steel cable observed	New	Acceptable	SSL- 47
Presence & Condition of Monitoring Instruments	No		Not observed									None observed; none present historically		
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No	A1 & A2	Not observed								Localized subtle depressions with desiccation cracks	Not observed in 2019. Area entirely re-graded.		Not observed in 2019

Table 7-1: Visual Inspection Checklist – South Shore Landfill

Checklist Item	Present (Yes/No)	Feature ID	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)			Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Features of Note/Other Relevant Observations	Yes	Feature B	Desiccation cracking	496356.503;	7665997.722	13N	18	10	0.1	<1%	Desiccation cracking at surface observed in truck rutting and other isolated areas. Typically seen at edge of tire rutting/ponded areas.	Location of desiccation cracking appears to have shifted as a result of site re-grading.	Acceptable	SSL- 18, -19, -27, -28
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No	C	Not observed								905 m^2 depression with standing water	Not observed in 2015 or in 2019. Area entirely re-graded.		Not observed in 2019
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No	H	Not observed								Heavy equipment tracks and ruts	Not observed in 2019. Area entirely re-graded.		Not observed in 2019
Features of Note/Other Relevant Observations	No	K	Not observed								Tire rutting	Not observed in 2019. Area entirely re-graded.		Not observed in 2019
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	Feature M1	Heavy truck tire rutting	496250.835;	7666001.853	13N	70m	7m	0.3	1%	Numerous tire ruts in landfill cover found in a N-E to S-W orientation; numerous ruts in other areas of cover also (see Figure CAM-M.6B)	New rutting observed	Acceptable	SSL-28, -38, -39, -65
Features of Note/Other Relevant Observations	Yes	Feature M2	Heavy truck tire rutting	496286.842;	7665996.752	13N	70m	7m	0.3	1%	Numerous tire ruts in landfill cover found in a N-E to S-W orientation; numerous ruts in other areas of cover also (see Figure CAM-M.6B)	New rutting observed	Acceptable	SSL-28, -38, -39, -64
Features of Note/Other Relevant Observations	Yes	-	SE corner of landfill: 200L drums on pallets	496361.667;	7666004.045	13N	6	2	-	<1%	8 drums on pallets; additional drums on pallets found beyond landfill crest	New placement of drums	Acceptable	SSL-15, -21

7.3.1.1 Preliminary Stability Assessment

The Preliminary Stability Assessment for the South Shore Landfill was conducted on August 29, 2019 as per the TOR and the results are provided below in the Table below.

Table 7-2: Preliminary Stability Assessment – South Shore Landfill

Feature	Severity Rating	Extent
Settlement	Not Observed	None
Erosion	Not Observed	None
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Not Observed	None
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Acceptable	Ponding noted at middle of landfill and associated with tire rutting.
Debris and/or Liner Exposure	Acceptable	Isolated debris
Other	Acceptable	Isolated tire truck rutting and desiccation cracking observed
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

7.3.1.2 Photographic Records

The detailed photographic record for the South Shore Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix E**. The Photographic Record contains an index of photographs collected; full sized photographs are contained in the appended CD/DVD-ROM. **Figures CAM-M.6B and M6C** illustrate the photograph locations and viewpoint directions.

7.3.2 Soil and Groundwater Sampling

Per the Work Plan, no environmental soil or groundwater sampling was complete at the South Shore Landfill in 2019.

7.3.3 Thermal Monitoring

No thermistors are present at this landfill location.

7.4 Conclusions and Overall Landfill Performance

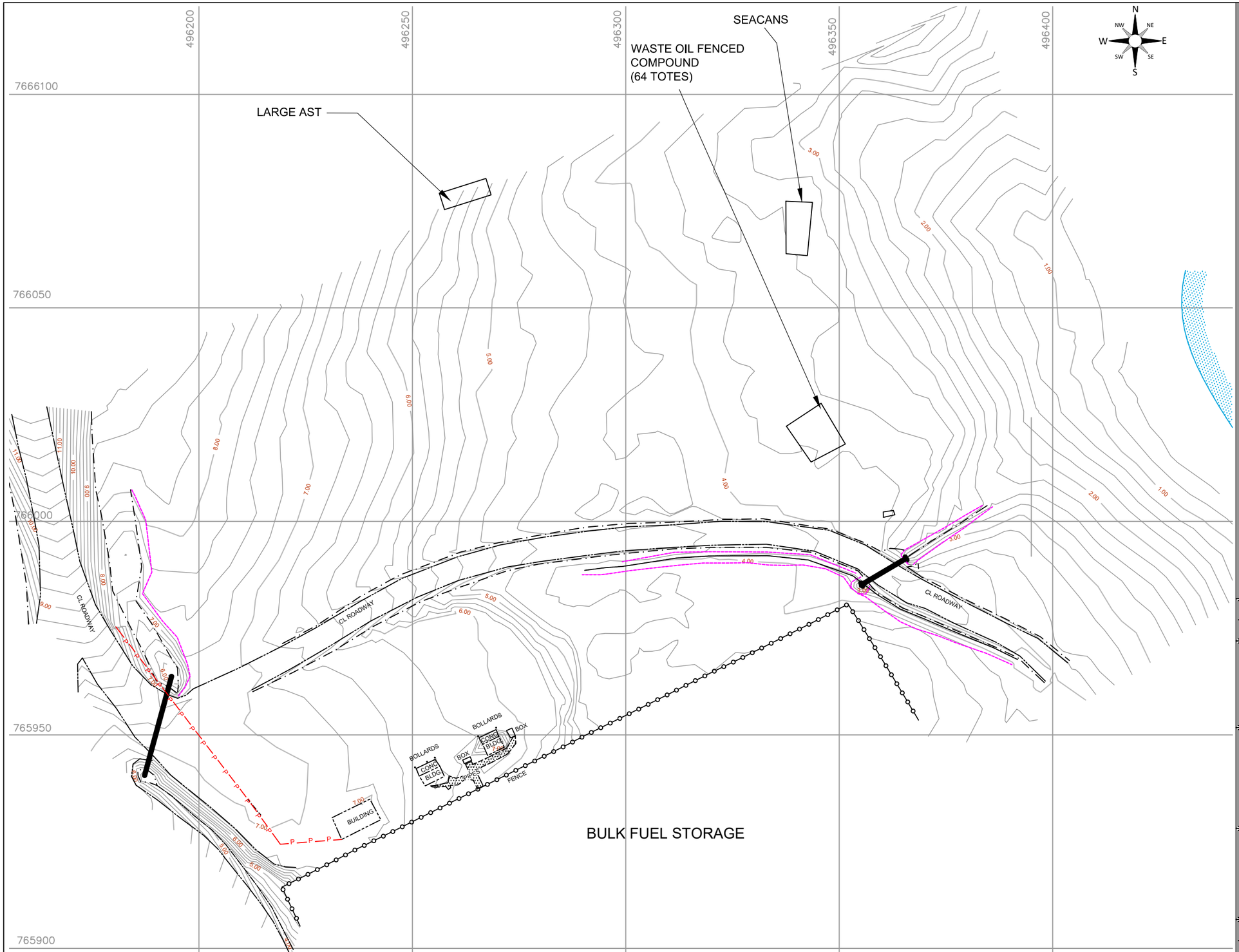
Based on the results of the 2019 visual inspection and monitoring program, the overall performance of the South Shore landfill is acceptable.

In August 2019, visual inspections were completed at the South Shore Landfill for the presence of fuel spills or surface staining from petroleum hydrocarbons. No distinct areas of spills or staining were observed in August 2019 at fuel transfer areas. No visual evidence of spills were observed within the tank farm based on observations made from outside of the fenced compound. No soil or groundwater sampling for PHCs was conducted in 2019.

7.5 Recommendations

In the absence of updated 2019 environmental soil and groundwater results, it is recommended that the long-term monitoring of environmental site conditions continue as planned.

Based on the results of the visual inspections, the South Shore landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.



LEGEND

- CENTERLINE OF ROAD
- SHOULDER OF ROAD
- CREST SHOWN
- TOE SHOWN
- FENCE
- DITCH
- BUILDING
- CULVERT
- ELECTRICAL LINE
- GUY LINE AND ANCHOR
- POWER POLE
- MAJOR CONTOUR LINES
- MINOR CONTOUR LINES
- BOLLARD
- PERIMETER (APPROX.) OF PIPES

DISTANCES AND ELEVATIONS SHOWN ARE IN METRES AND DECIMALS THEREOF.

BEARINGS ARE UTM NAD83 (CSRS), DERIVED FROM GNSS OBSERVATIONS.

COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 13.

ELEVATIONS ARE ORTHOMETRIC BASED ON THE CGVD2013 GEOID MODEL..

ALL COORDINATES AND ELEVATIONS ARE BASED ON A PRECISE POINT POSITION (PPP) AT 3000. THE EXPECTED UNCERTAINTY OF THE POSITION OF 3000 IS +/- 0.02 METERS. THE POSITIONS OF CM1 AND CM2 ARE BASED ON MEASUREMENTS FROM 3000".

CONTOUR INTERVAL = 0.25M

DATE OF SURVEY: AUGUST 29, 2019

Meters

20 0 20 40

1:900

NO.	VERSION	DATE	BY	VERIF.	APPR.
3	FINAL	2020.03.26	RF	TA	CG

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Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

SOUTH SHORE LANDFILL TOPOGRAPHICAL SURVEY

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE	DATE PLOTTED (DD/MM/YY)
Metre	1:900	MARCH 2020
DRAWN BY	VERIFIED BY	APPROVED BY
R. FLETCHER	T. AUSTRINS, P.ENG	C. GRAVELLE, P.ENG
PROJECT NO.	DRAWING NO.	PAGE
30000251	30000251-CAM-M.4A	

FIGURE CAM-M.6A

496200
496250
496300
496350
496400
7666100
766050
766000
765950
765900
N
NW
NE
W
E
SW
SE
S
LARGE AST
WASTE OIL FENCED COMPOUND (64 TOTES)
SEACANS
FEATURE N STEEL CABLE
CM–1
CM–2
CM–3
CM–4
FEATURE B + M2 TIRE RUTTING AND DESICCATION CRACKING
FEATURE O PONDING
FEATURE M1 TIRE RUTTING
DRUMS ON PALLETS
20 DRUMS
8 DRUMS
CL ROADWAY
BULK FUEL STORAGE
BOLLARDS
CONC. BLDG.
BOX
STEPS
FENCE
BUILDING
Meters
20 0 20 40
1:900

LEGEND

- CENTERLINE OF ROAD
- SHOULDER OF ROAD
- CREST SHOWN
- TOE SHOWN
- FENCE
- DITCH
- BUILDING
- CULVERT
- ELECTRICAL LINE
- GUY LINE AND ANCHOR
- POWER POLE
- MAJOR CONTOUR LINES
- MINOR CONTOUR LINES
- BOLLARD
- PERIMETER (APPROX.) OF PIPES
- LANDFILL CREST
- LANDFILL TOE
- HISTORICAL SOIL MONITORING POINT

VISUAL INSPECTION 2019

- APPROX. PHOTOGRAPHIC VIEWPOINT (2019)
- PONDING
- TIRE RUTTING
- DEBRIS
- DESICCATION CRACKING

NO.	VERSION	DATE	BY	VERIF.	APPR.
3	FINAL	2020.03.26	RF	TA	CG

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Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

SOUTH SHORE LANDFILL VISUAL INSPECTION 2019

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1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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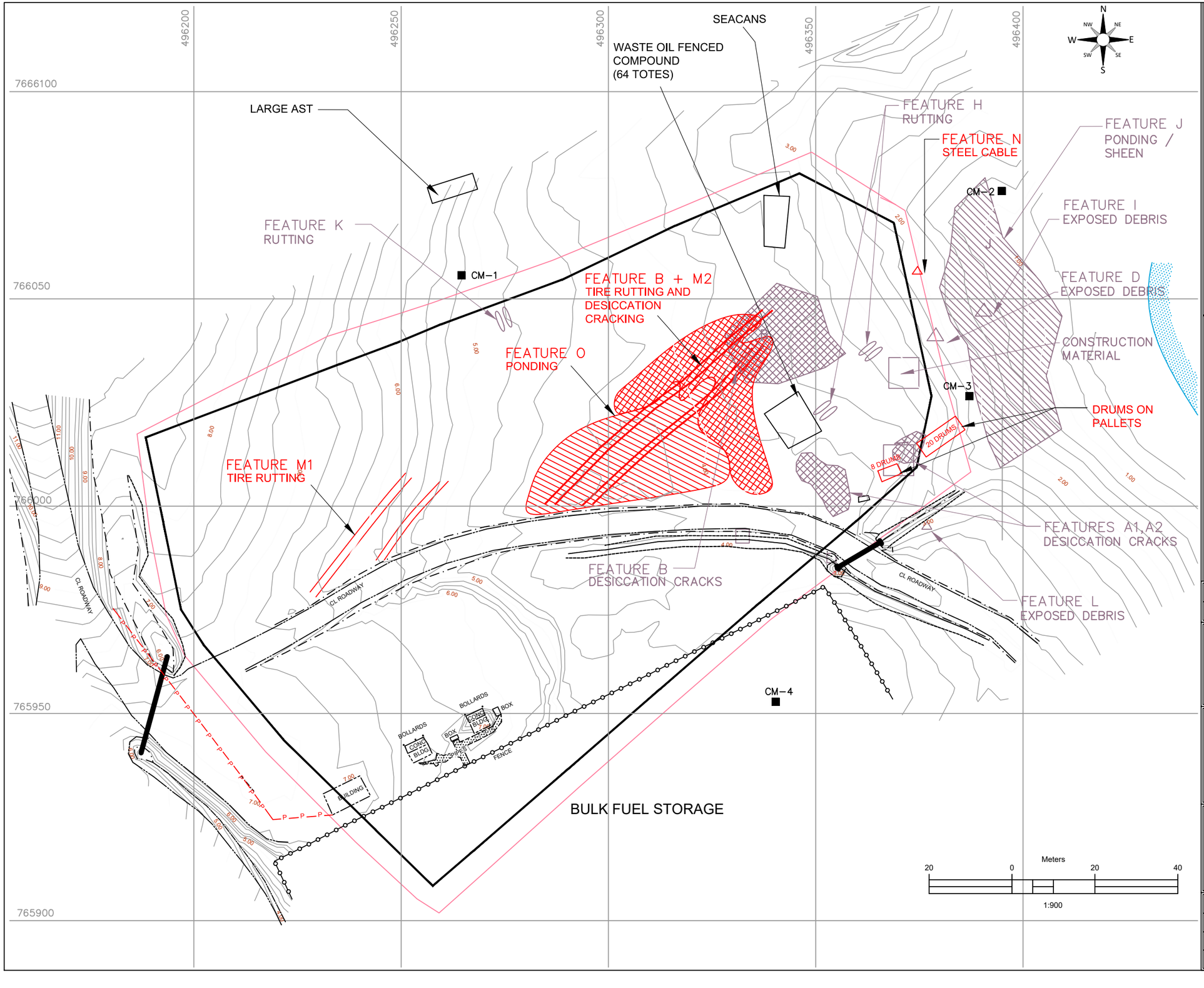
MEASUREMENT UNIT: Metre	SCALE: 1:900	STANDARD DATE: MARCH 2020
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS, P.ENG	APPROVED BY: C. GRAVELLE, P.ENG
PROJECT NO: 30000251	DRAWING NO: 30000251-CAM-M.4B	PAGE

FIGURE CAM-M.6B



LEGEND

- CENTERLINE OF ROAD
- SHOULDER OF ROAD
- CREST SHOWN
- TOE SHOWN
- FENCE
- DITCH
- BUILDING
- CULVERT
- ELECTRICAL LINE
- GUY LINE AND ANCHOR
- POWER POLE
- MAJOR CONTOUR LINES
- MINOR CONTOUR LINES
- BOLLARD
- PERIMETER (APPROX.) OF PIPES
- LANDFILL CREST
- LANDFILL TOE
- HISTORICAL SOIL MONITORING POINT

VISUAL INSPECTION 2019

- APPROX. PHOTOGRAPHIC VIEWPOINT (2019)
- PONDING
- TIRE RUTTING
- DEBRIS
- DESICCATION CRACKING
- APPROXIMATE 2015 OBSERVATIONS (COLOUR) (TO ILLUSTRATE CHANGES)

NO.	VERSION	DATE	BY	VERIF.	APPR.
3	FINAL	2020.03.26	RF	TA	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

SOUTH SHORE LANDFILL VISUAL INSPECTION 2015 AND 2019

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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MEASUREMENT UNIT	SCALE:	DATE: (month–year):
Metre	1:900	MARCH 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	T. AUSTRINS, P.ENG	C. GRAVELLE, P.ENG
PROJECT NO.:	DRAWING NO.:	PAGE
30000251	30000251-CAM-M.4C	

FIGURE CAM-M.6C

APPENDIX A

Statement of Limitations

This report has been prepared exclusively for the Department of National Defence (DND) Canada. Any other person or entity may not rely upon the report without express written consent from Department of National Defence (DND) Canada.

Any use, which a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. Arcadis Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Some of the information presented in this report was provided through existing documents. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, Arcadis Canada Inc., in certain instances, has been required to assume that the information provided is accurate.

The conclusions presented represent the best judgment of the assessors based on current environmental standards and on the site conditions observed in August 2019. Due to the nature of the investigation and the limited data available, the assessors cannot warrant against undiscovered environmental liabilities.

Should additional information become available, Arcadis Canada Inc. requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

There is no warranty, expressed or implied that the work reported herein has uncovered all potential environmental liabilities, nor does the report preclude the possibility of contamination outside of the areas of investigation. The findings of this report were developed in a manner consistent with a level of care and skill normally exercised by members of the environmental science and engineering profession currently practicing under similar conditions in the area.

A potential remains for the presence of unknown, unidentified, or unforeseen surface and sub-surface contamination. Any evidence of such potential site contamination would require appropriate surface and sub-surface exploration and testing.

If new information is developed in future work (which may include excavations, borings, or other studies), Arcadis Canada Inc. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

APPENDIX B

B1- CAM-M Main Landfill North- Thermal Inspection Report

B2- CAM-M Main Landfill South- Thermal Inspection Report

B3- CAM-M -Tier II Disposal Facility - Thermal Inspection Report

APPENDIX B1

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name: CAM-M		*Landfill: Main Landfill North	
*Thermistor #: **ITN-1**		Inclination: Vertical	✓ Inclined
*Northing: 7667599.691		*Easting: 495847.7659	
*Installation Date: Sept-1999		*Year 1 Monitoring Date: 2000	
Datalogger Model #: RX-16		Datalogger Cable Model: ☑ USB	□ Serial Port
Datalogger Serial #: 805063		Datalogger Cable Too Short?: □ Y	☑ N
*Elevation (masl): 13.1		Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.16	Auxiliary: 10.58
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.15
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	16385	-0.0339
2	16949	-0.6926
3	17009	-0.7612
4	16829	-0.5545
5	16338	0.0221
6	15286	1.3259
7	15279	1.3349
8	15976	0.4598

Bead	ohms	°C
9	15981	0.0000
10	17756	0.0000
11	19870	0.0000
12	21600	0.0000
13	22860	0.0000
14	23310	0.0000
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name:	CAM-M	*Landfill:	Main Landfill North
*Thermistor #:	**ITN-2**	Inclination:	Vertical ✓ Inclined
*Northing:	7667538.791	*Easting:	495894.3659
*Installation Date:	Sept-1999	*Year 1 Monitoring Date:	2000
Datalogger Model #:	RX-16	Datalogger Cable Model:	☑ USB □ Serial Port
Datalogger Serial #:	805107	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	12.2	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed				
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 10.58
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.14
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	15699	0.8024
2	15280	1.3336
3	14866	1.8748
4	14751	2.0281
5	14490	2.3812
6	14136	2.8716
7	14635	2.1842
8	15171	1.4745

Bead	ohms	°C
9	15172	1.5
10	16338	0.0
11	17609	-1.4
12	19707	-3.6
13	21120	-4.9
14	21660	-5.4
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: *Elliot Holden*	Inspection Date: Aug. 14, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name: CAM-M	*Landfill: Main Landfill North
*Thermistor #: **VT-1**	Inclination: ✓ Vertical Inclined
*Northing: 7667590.791	*Easting: 495762.7659
*Installation Date: Sept-1999	*Year 1 Monitoring Date: 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB □ Serial Port
Datalogger Serial #: 805074	Datalogger Cable Too Short?: □ Y ☑ N
*Elevation (masl): 15.7	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	□	☑	Bead 7 not functioning

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.99
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.75
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13253	4.1576
2	14500	2.3675
3	15963	0.4758
4	17455	-1.2630
5	18356	-2.2342
6	19315	-3.2109
7	NA	NA
8	21050	-4.8473

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name: CAM-M	*Landfill: Main Landfill North
*Thermistor #: **VT-2**	Inclination: ✓ Vertical Inclined
*Northing: 7667509.17	*Easting: 495913.2759
*Installation Date: Sept-1999	*Year 1 Monitoring Date: 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB □ Serial Port
Datalogger Serial #: 805136	Datalogger Cable Too Short?: □ Y ☑ N
*Elevation (masl): 15.3	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.75
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.14
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	12001	6.1562
2	12695	5.0209
3	13523	3.7544
4	14515	2.3471
5	15609	0.9151
6	16502	-0.1726
7	17104	-0.8693
8	-	-

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name: CAM-M	*Landfill: Main Landfill North
*Thermistor #: **VT-3**	Inclination: ✓ Vertical Inclined
*Northing: 7667562.386	*Easting: 495866.0659
*Installation Date: Sept-1999	*Year 1 Monitoring Date: 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB □ Serial Port
Datalogger Serial #: 805146	Datalogger Cable Too Short?: □ Y ☑ N
*Elevation (masl): 13.7	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.26
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.2
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	11,990	6.1748
2	12428	5.4493
3	13348	4.0147
4	14290	2.6566
5	15301	1.3066
6	16435	-0.0933
7	17056	-0.8148
8	-	-

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

APPENDIX B2

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name: CAM-M		*Landfill: Main Landfill South	
*Thermistor #: **ITS-1**		Inclination: Vertical	✓ Inclined
*Northing: 7667335.812		*Easting: 495792.1848	
*Installation Date: 2000		*Year 1 Monitoring Date: 2001	
Datalogger Model #: RX-16		Datalogger Cable Model: ☑ USB	□ Serial Port
Datalogger Serial #: 807033		Datalogger Cable Too Short?: □ Y	☑ N
*Elevation (masl): -		Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.63
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.14
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13,879	3.2364
2	11404	7.1937
3	15490	1.0653
4	16224	0.1588
5	16525	-0.1998
6	16681	-0.3827
7	17302	-1.0925
8	17304	-1.0947

Bead	ohms	°C
9	17023	-0.8
10	16384	0.0
11	15797	0.7
12	14439	2.5
13	14410	2.5
14	14440	2.4
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name: CAM-M		*Landfill: Main Landfill South	
*Thermistor #: **ITS-2**		Inclination: Vertical	✓ Inclined
*Northing: 7667286.773		*Easting: 495743.1159	
*Installation Date: 2000		*Year 1 Monitoring Date: 2001	
Datalogger Model #: RX-16		Datalogger Cable Model: ☑ USB	□ Serial Port
Datalogger Serial #: 805163		Datalogger Cable Too Short?: □ Y	☑ N
*Elevation (masl): -		Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.26
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.2
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13,929	3.1648
2	13754	3.4165
3	13960	3.1206
4	16351	0.0066
5	16401	-0.0530
6	16664	-0.3629
7	17079	-0.8409
8	17143	-0.9135

Bead	ohms	°C
9	16691	-0.4
10	16399	-0.1
11	15128	1.5
12	13900	3.2
13	13528	3.7
14	13943	3.1
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name: CAM-M	*Landfill: Main Landfill South
*Thermistor #: **VT-4**	Inclination: ✓ Vertical Inclined
*Northing: 7667336.279	*Easting: 495729.1159
*Installation Date: 2000	*Year 1 Monitoring Date: 2001
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB □ Serial Port
Datalogger Serial #: 805148	Datalogger Cable Too Short?: □ Y ☑ N
*Elevation (masl): 16.5	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.14
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.14
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	12,595	5.1801
2	12186	5.8465
3	12946	4.6274
4	14015	3.0424
5	15116	1.5460
6	16151	0.2469
7	16800	-0.5210
8	-	-

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 19-Aug-15

Thermistor Information

*Site Name: CAM-M	*Landfill: Main Landfill South
*Thermistor #: **VT-5**	Inclination: ✓ Vertical Inclined
*Northing: 7667286.773	*Easting: 495743.1159
*Installation Date: 2000	*Year 1 Monitoring Date: 2001
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB □ Serial Port
Datalogger Serial #: 805150	Datalogger Cable Too Short?: □ Y ☑ N
*Elevation (masl): 11.5	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.14
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.15
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	12,032	6.1040
2	11725	6.6285
3	12407	5.4834
4	13314	4.0657
5	14241	2.7247
6	15196	1.4421
7	16014	0.4134
8	-	-

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

APPENDIX B3

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 16-Aug-15

Thermistor Information

*Site Name: CAM-M	*Landfill: Tier II Landfill
*Thermistor #: **TA-1**	Inclination: ✓ Vertical Inclined
*Northing: 7669232.653	*Easting: 494337.9396
*Installation Date: Sept-1999	*Year 1 Monitoring Date: 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB □ Serial Port
Datalogger Serial #: 805175	Datalogger Cable Too Short?: □ Y ☑ N
*Elevation (masl): 43.8	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.63
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.21
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13,868	3.2521
2	13081	4.4193
3	13335	4.0342
4	15022	1.6689
5	16493	-0.1620
6	17687	-1.5183
7	19989	-3.8654
8	-	-

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name:	Ryan Fletcher	Inspection Date:	Aug. 24, 2019
Inspector Signature:		*Previous Inspection Date:	16-Aug-15

Thermistor Information

*Site Name:	CAM-M	*Landfill:	Tier II Landfill
*Thermistor #:	**TA-2**	Inclination:	✓ Vertical Inclined
*Northing:	7669242.154	*Easting:	494381.5396
*Installation Date:	Sept-1999	*Year 1 Monitoring Date:	2000
Datalogger Model #:	RX-16	Datalogger Cable Model:	☑ USB □ Serial Port
Datalogger Serial #:	805072	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	43.4	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details	
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□			
	Battery models:				Main: ULB-15	Auxiliary: ULB-1
	Battery installation date:				Aug. 2015	
	Battery levels:				Main: 11.34	Auxiliary: 13.63
	Memory battery best before date:				No sticker	(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1
	New battery levels:			□	Main: 11.34	Auxiliary: 13.14
	Was desiccant replaced?	☑	□			
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by: Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13,895	3.2134
2	12703	5.0082
3	13645	3.5751
4	15560	0.9768
5	16637	-0.3313
6	17775	-1.6142
7	18776	-2.6688
8	-	-

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug. 24, 2019
Inspector Signature:	*Previous Inspection Date: 16-Aug-15

Thermistor Information

*Site Name:	CAM-M	*Landfill:	Tier II Landfill
*Thermistor #:	**TA-3**	Inclination:	✓ Vertical Inclined
*Northing:	7669292.023	*Easting:	494329.1396
*Installation Date:	Sept-1999	*Year 1 Monitoring Date:	2000
Datalogger Model #:	RX-16	Datalogger Cable Model:	☑ USB □ Serial Port
Datalogger Serial #:	805132	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	43	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:		`		Aug. 2015		
	Battery levels:				Main: 11.34	Auxiliary: 13.5	
	Memory battery best before date:				No sticker		(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1	
	New battery levels:			□	Main: 11.34	Auxiliary: 13.3	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by:	Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	□ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13,534	3.7381
2	12873	4.7410
3	13781	3.3775
4	16044	0.3768
5	17153	-0.9248
6	18213	-2.0836
7	19340	-3.2356
8	-	-

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name:	Ryan Fletcher	Inspection Date:	Aug. 24, 2019
Inspector Signature:		*Previous Inspection Date:	16-Aug-15

Thermistor Information

*Site Name:	CAM-M	*Landfill:	Tier II Landfill
*Thermistor #:	**TA-4**	Inclination:	✓ Vertical Inclined
*Northing:	7669260.353	*Easting:	494298.2396
*Installation Date:	Sept-1999	*Year 1 Monitoring Date:	2000
Datalogger Model #:	RX-16	Datalogger Cable Model:	☑ USB □ Serial Port
Datalogger Serial #:	805060	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	44.2	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model: 7000PS-KA3

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				Aug. 2015		
	Battery levels:				Main: 11.34	Auxiliary: 13.99	
	Memory battery best before date:				No sticker		(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models:	ULB-15, ULB-1	
	New battery levels:			□	Main: 11.34	Auxiliary: 13.5	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 7	Replace by:	Jun-26
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	□ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13,727	3.4557
2	12795	4.8631
3	13325	4.0492
4	15289	1.3220
5	16565	-0.2469
6	17530	-1.3459
7	18453	-2.3355
8	-	-

Bead	ohms	°C
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

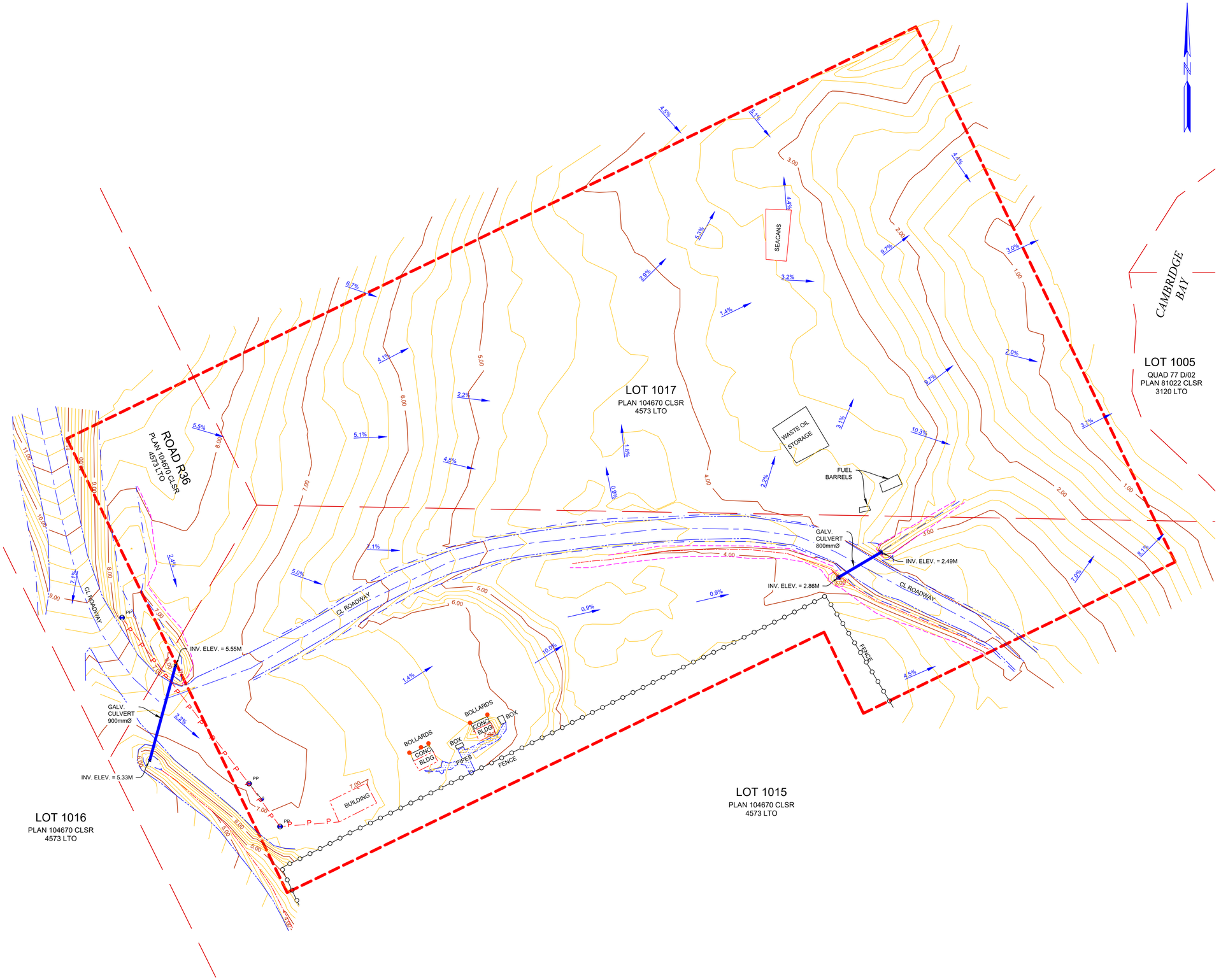
Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

APPENDIX C

South Shore Landfill 2019 Plan of Survey



UTM COORDINATES, NAD83-CSRS (EPOCH 2010) ZONE 13, CENTRAL MERIDIAN 105° WEST			
POINT #	NORTHING	EASTING	ELEVATION
GCP1	7666536.78	495890.67	16.60
GCP2	7667224.06	495345.08	31.47
3000	7668102.44	497148.24	12.32

GCP1, GCP2 AND 3000 ARE OUTSIDE THE LIMITS OF THIS PLAN.

NOTES:

DISTANCES AND ELEVATIONS SHOWN ARE IN METRES AND DECIMALS THEREOF.

BEARINGS ARE UTM NAD83 (CSRS), DERIVED FROM GNSS OBSERVATIONS.

COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 13.

ELEVATIONS ARE ORTHOMETRIC BASED ON THE CGVD2013 GEOID MODEL..

ALL COORDINATES AND ELEVATIONS ARE BASED ON A PRECISE POINT POSITION (PPP) AT 3000. THE EXPECTED UNCERTAINTY OF THE POSITION OF 3000 IS +/- 0.02 METERS. THE POSITIONS OF CM1 AND CM2 ARE BASED ON MEASUREMENTS FROM 3000".

CONTOUR INTERVAL = 0.25M

DATE OF SURVEY: AUGUST 2019

THE PLOT SIZE THAT WILL PROVIDE TRUE SCALE AND OPTIMUM READABILITY FOR THIS PLAN IS 609MM X 800MM.

LEGEND:

AREA OF INTEREST / TOPO LIMITS SHOWN THUS . . . .
CENTERLINE OF ROAD SHOWN THUS . . . . . .
SHOULDER OF ROAD SHOWN THUS . . . . . .
CREST SHOWN THUS . . . . . .
TOE SHOWN THUS . . . . . .
FENCE SHOWN THUS . . . . . .
DITCH SHOWN THUS . . . . . .
BUILDING SHOWN THUS . . . . . .
CULVERT SHOWN THUS . . . . . .
ELECTRICAL LINE SHOWN THUS . . . . . — P — P — P —
GUY LINE AND ANCHOR SHOWN THUS . . . . . PP
POWER POLE SHOWN THUS . . . . . .
PERIMETER (APPROX.) OF PIPES SHOWN THUS . . . . . .
MAJOR CONTOUR LINES SHOWN THUS . . . . . .
MINOR CONTOUR LINES SHOWN THUS . . . . . .
BOLLARD SHOWN THUS . . . . . .

REV.	DESCRIPTION	BY	DATE
0	ISSUED ORIGINAL DRAWING	TDD/PAB	08/23/2019

ARCADIS CANADA INC.

TOPOGRAPHIC SURVEY
OF
SOUTH SHORE LANDFILL
CAMBRIDGE BAY, NUNAVUT

DRAWN BY	CHECKED BY	DATE	SCALE
MW/TDD	PB	SEPTEMBER 5, 2019	1 : 500

INUKSHUK Geomatics Inc.
302 JARVIS STREET
WHITEHORSE, YUKON Y1A 2H2
(PH) 867-668-6940
EMAIL WHITEHORSE@QIKIALGEO.COM

JOB No. : 19-35127-TOPO

REV. 0

19-35127 Topo Survey Landfill.dwg

APPENDIX D

Field Notes

ANNEX M: Thermistor Inspection Template

Inspector Name: ELLIOTT HOLDEN	Inspection Date: 2019-08-14
Inspector Signature:	*Previous Inspection Date: 2015-08-16

Thermistor Information

*Site Name: CAM-M	*Landfill: MAIN LANDFILL NORTH
*Thermistor #: VT-1	Inclination: ☒ Vertical ☐ Inclined
*Northing:	*Easting:
*Installation Date: 1999-09-25	*Year 1 Monitoring Date:
Datalogger Model #: R-X REVISION G-C	Datalogger Cable Model: ☐ USB ☒ Serial Port
Datalogger Serial #: 805074	Datalogger Cable Too Short?: ☐ Y ☒ N
*Elevation (masl):	Extension Cable Required (m): NO ☐ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☐	☒	BEAD 7 NOT WORKING

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

		Yes	No	N/A	Details
Batteries Found in Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: ULBIS Auxiliary: ULB1
	Battery installation date:				
	Battery levels:				Main: 11.34 Auxiliary: 13.99
	Memory battery best before date:				NO YELLOW LABEL (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULBIS AND ULB1
	New battery levels:			☐	Main: ~~XBSH~~ 11.34V Auxiliary: 13.75
	Was desiccant replaced?	☐	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: MO6 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.253	
2	14.500	
3	15.963	
4	17.455	
5	18.356	
6	19.315	
* 7	NV	
8	2.105	

NV = NO VALUE

Bead	ohms	°C

Datalogger Programming and Maintenance

Data collection frequency: 48 HOURS
Data collection time: NOON
Maintenance requirements:

CLAG = 3.7M

*Pre-populate this information before field program using previous reports

TA-1 Tier II LF

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 24 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015-08-16

Thermistor Information

*Site Name: CAM-M	*Landfill: Tier II
*Thermistor #: TA-1	Inclination: ☒ Vertical ☐ Inclined
*Northing: 12007.0	*Easting: 8994.0
*Installation Date: ~~21-Jun-05~~ 1999-09-25	*Year 1 Monitoring Date: ~~23-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 80517S	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 43.8	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☒	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:				08/2015
	Battery levels:				Main: 11.34 Auxiliary: 13.63
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULB 15 / ULB 1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.21
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.866	
2	13.081	
3	13.335	
4	15.022	
5	16.493	
6	17.687	
7	19.989	
8	—	

Bead	ohms	°C
9		
10		
11		
12		
13		
14		
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

TA-2 Tier II LF

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 24 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015-08-16

Thermistor Information

*Site Name: CAM-M	*Landfill: Tier II
*Thermistor #: TA-2	Inclination: ☒ Vertical ☐ Inclined
*Northing: 12017.0	*Easting: 9037.0
*Installation Date: ~~21-Jun-05~~ 1999-09-25	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805072	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 43.4	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☒	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: 11134 Auxiliary: 13163
	Battery installation date:				08/2015
	Battery levels:				Main: ULB-15 Auxiliary: ULB-1
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULB-15 / ULB-1
	New battery levels:			☐	Main: 11134 Auxiliary: 13.14
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.895	
2	17.703	
3	13.645	
4	15.560	
5	16.637	
6	17.775	
7	16.776	
8	—	

Bead	ohms	°C
9		
10		
11		
12		
13		
14		
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

TA-3 Tier II LF

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 24 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015/08/16

Thermistor Information

*Site Name: CAM-M	*Landfill: Tier II
*Thermistor #: TA-3	Inclination: ☒ Vertical ☐ Inclined
*Northing: 12067.0	*Easting: 8968.0
*Installation Date: ~~21-Jun-05~~ 1999-09-25	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805132	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 43.0	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☒	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: ULB15 Auxiliary: ULB1
	Battery installation date:				08/2015
	Battery levels:				Main: 11.34 Auxiliary: 13.50
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULB-15 / ULB-1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.3
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.534	
2	12.673	
3	13.761	
4	16.044	
5	17.153	
6	18.213	
7	19.340	
8	—	

Bead	ohms	°C
9		
10		
11		
12		
13		
14		
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

TA-4 Tier II LF

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 27 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015/06/16

Thermistor Information

*Site Name: CAM-M	*Landfill: Tier II
*Thermistor #: TA-4	Inclination: ☑ Vertical ☐ Inclined
*Northing: 12035.0	*Easting: 8954.0
*Installation Date: ~~21-Jun-05~~ 1999-04-25	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805060	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 44.2	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☒	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:				08/2015
	Battery levels:				Main: 11.34 Auxiliary: 13.99
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULB-15 / ULB-1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.5
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.727	
2	12.795	
3	13.325	
4	15.269	
5	16.565	
6	17.530	
7	18.455	
8	—	

Bead	ohms	°C
9		
10		
11		
12		
13		
14		
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

VT3 Main N

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 29 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015/06/19

Thermistor Information

*Site Name: CAM-M	*Landfill: Main LF N
*Thermistor #: VT3	Inclination: ☐ Vertical ☐ Inclined
*Northing: 10366.0	*Easting: 10418.0
*Installation Date: ~~21-Jun-05~~ 1999-09-25	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805146	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 15.7	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	☐		
Was a poorly functioning lock removed?	☑	☐		
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	☐		
	Battery models:				Main: ULB 15 Auxiliary: ULB 1
	Battery installation date:				Aug 2015
	Battery levels:				Main: 11.34 Auxiliary: 13.26
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	☐		If yes, models:
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.2
	Was desiccant replaced?	☑	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☑	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	11.990	
2	12.426	
3	13.348	
4	14.290	
5	15.301	
6	16.435	
7	17.056	
8	—	

Bead	ohms	°C
9		
10		
11		
12		
13		
14		
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

ITN-2 Main N

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 27 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015/08/19

Thermistor Information

*Site Name: CAM-M	*Landfill: Main LFN
*Thermistor #: ITN-2	Inclination: ☐ Vertical ☐ Inclined
*Northing: 10314.0	*Easting: 10550.0
*Installation Date: ~~21-Jun-05~~ 1999-09-25	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805107	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl):	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	☐		
Was a poorly functioning lock removed?	☑	☐		
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	☐		
	Battery models:				Main: ULB 15 Auxiliary: ULB1
	Battery installation date:				08/2015
	Battery levels:				Main: 11.34 Auxiliary: 10.58
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	☐		If yes, models: ULB 15 / ULB1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.14
	Was desiccant replaced?	☑	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☑	☐		If no, brought south for repairs? ☐ Y ☒ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	15.699	
2	15.280	
3	14.866	
4	14.751	
5	14.490	
6	14.136	
7	14.635	
8	15.171	

Bead	ohms	°C
9	15.172	
10	16.338	
11	17.609	
12	19.707	
13	21.12	
14	21.66	
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: NONE

ITN-1 Main N

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 29 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015/08/19

Thermistor Information

*Site Name: CAM-M	*Landfill: Main LFN
*Thermistor #: ITN-1	Inclination: ☐ Vertical ☒ Inclined
*Northing: 10366.0	*Easting: 10418.0
*Installation Date: ~~21-Jun-05~~ 1999-09-25	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805063	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 2.	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	☐		
Was a poorly functioning lock removed?	☑	☐		
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	☐		
	Battery models:				Main: ULB 15 Auxiliary: ULB 1
	Battery installation date:				Aug 2015
	Battery levels:				Main: 11.16 Auxiliary: 10.58
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	☐		If yes, models: ULB 15 / ULB-1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.15
	Was desiccant replaced?	☑	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☐	☐		If no, brought south for repairs? ☐ Y ☒ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	16.385	
2	16.949	
3	17.009	
4	16.629	
5	16.336	
6	15.286	
7	15.279	
8	15.976	

Bead	ohms	°C
9	15.961	
10	17.756	
11	19.870	
12	21.60	
13	22.86	
14	23.31	
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

VT #2 Main N

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 24 2019
Inspector Signature:	*Previous Inspection Date: ~~15-Aug-15~~ 2015/08/19

Thermistor Information

*Site Name: CAM-M	*Landfill: Main LF North
*Thermistor #: VT-2	Inclination: ☒ Vertical ☐ Inclined
*Northing: 10284.0	*Easting: 10569.0
*Installation Date: ~~21-Jun-05~~ 1999-09-25	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805136	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 15.3	Extension Cable Required (m): ☑ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☐	☑		
Was a poorly functioning lock removed?	☑	☐		
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	☐		
	Battery models:				Main: 11.34 Auxiliary: 13.75
	Battery installation date:				Aug 2015
	Battery levels:				Main: VLB15 Auxiliary: VLB1
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	☐		If yes, models: VLB15 VLB1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.14
	Was desiccant replaced?	☑	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☑	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	12.001	
2	12.695	
3	13.523	
4	14.515	
5	15.609	
6	16.502	
7	17.104	
8	—	

Bead	ohms	°C
9		
10		
11		
12		
13		
14		
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

ITS-2 Main S

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 27 2019
Inspector Signature:	*Previous Inspection Date: ~~15-Aug-15~~ 2015/08/19

Thermistor Information

*Site Name: CAM-M	*Landfill: Main LFS
*Thermistor #: ITS-2	Inclination: ☐ Vertical ☒ Inclined
*Northing: 10062.0	*Easting: 10399.0
*Installation Date: ~~21-Jun-05~~ 1999-07-14	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805163	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): Varies	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	☐		
Was a poorly functioning lock removed?	☑	☐		
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	☐		
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:				08/2015
	Battery levels:				Main: 11.34 Auxiliary: 13.26
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	☐		If yes, models: ULB-15 / ULB-1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.20
	Was desiccant replaced?	☑	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☑	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.929	
2	13.754	
3	13.960	
4	16.351	
5	16.401	
6	16.664	
7	17.079	
8	17.143	

Bead	ohms	°C
9	16.691	
10	16.399	
11	15.126	
12	13.900	
13	13.526	
14	13.943	
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: none

ITS-1 Main 5

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 27 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015/08/19

Thermistor Information

*Site Name: CAM-M	*Landfill: Main LFS
*Thermistor #: ITS-1	Inclination: ☐ Vertical ☒ Inclined
*Northing: 10111.0	*Easting: 10448.0
*Installation Date: ~~21-Jun-05~~ 1999-07-12	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2000
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 207055	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): Varies	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	☐		
Was a poorly functioning lock removed?	☑	☐		
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	☐		
	Battery models:				Main: ULB-15 Auxiliary: ULB1
	Battery installation date:				08/2015
	Battery levels:				Main: 11.34 Auxiliary: 13.03
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	☐		If yes, models: ULB15 / ULB-1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.14
	Was desiccant replaced?	☑	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 20__
	Was datalogger functional upon departure?	☑	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.879	
2	11.904	
3	15.490	
4	16.224	
5	16.525	
6	16.681	
7	17.302	
8	17.304	

Bead	ohms	°C
9	17.023	
10	16.384	
11	15.797	
12	14.439	
13	14.410	
14	14.440	
15	/	
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

VT-5 Main 5

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 24 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015/08/19

Thermistor Information

*Site Name: CAM-M	*Landfill: Main LF 5
*Thermistor #: VT-5	Inclination: ☒ Vertical ☐ Inclined
*Northing: 10056.0	*Easting: 10401.0
*Installation Date: ~~21-Jun-05~~ 2000-04-09	*Year 1 Monitoring Date: ~~22-Jun-05~~ 2001
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #: 805150	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 11.5	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	☐		
Was a poorly functioning lock removed?	☑	☐		
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	☐		
	Battery models:				Main: ULB 15 Auxiliary: ULB 1
	Battery installation date:				
	Battery levels:				Main: 11.34 Auxiliary: 13.14
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	☐		If yes, models: ULB-15 / ULB-1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.15
	Was desiccant replaced?	☑	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☑	☐		If no, brought south for repairs? ☐ Y ☒ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	12.032	
2	11.725	
3	12.407	
4	13.314	
5	14.241	
6	15.196	
7	16.014	
8	—	

Bead	ohms	°C
9		
10		
11		
12		
13		
14		
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

VT-4 Main 5

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 24 2019
Inspector Signature:	*Previous Inspection Date: ~~16-Aug-15~~ 2015/08/19

Thermistor Information

*Site Name: CAM-M	*Landfill: Main LF 5
*Thermistor #: VT-4	Inclination: ☒ Vertical ☐ Inclined
*Northing: 10111.0	*Easting: 10385.0
*Installation Date: ~~21-Jun-05~~ 2000-09-09	*Year 1 Monitoring Date: ~~22-Jun-06~~ 2001
Datalogger Model #: RX-16	Datalogger Cable Model: ☑ USB ☐ Serial Port
Datalogger Serial #:	Datalogger Cable Too Short?: ☐ Y ☑ N
*Elevation (masl): 16.5	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	☐		
Was a poorly functioning lock removed?	☑	☐		
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: ULB15 Auxiliary: ULB1
	Battery installation date:				08/2015
	Battery levels:				Main: 11.34 Auxiliary: 13.14
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULB-15/ ULB-1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.14
	Was desiccant replaced?	☑	☐		
Final Status	Expected life of batteries in datalogger:				Years: 7 Replace by: 06 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☒ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	12.595	
2	12.186	
3	12.946	
4	14.015	
5	15.116	
6	16.151	
7	16.600	
8		

Bead	ohms	°C
9		
10		
11		
12		
13		
14		
15		
16		

Datalogger Programming and Maintenance

Data collection frequency: 48 hours
Data collection time: 12:00
Maintenance requirements: None

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	CAM-M
LANDFILL DESIGNATION:	Tier II (→ 2019 inspections of Features B2 + N only)
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	Tier II
DATE OF INSPECTION:	29 Aug. 2019
WEATHER CONDITIONS:	partly cloudy, winds from N., 12 km/hr, 5°C
DATE OF PREVIOUS INSPECTION:	
INSPECTED BY (name and signature):	T. Austria,
REPORT PREPARED BY (name and signature):	T. Austria,

The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; It should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

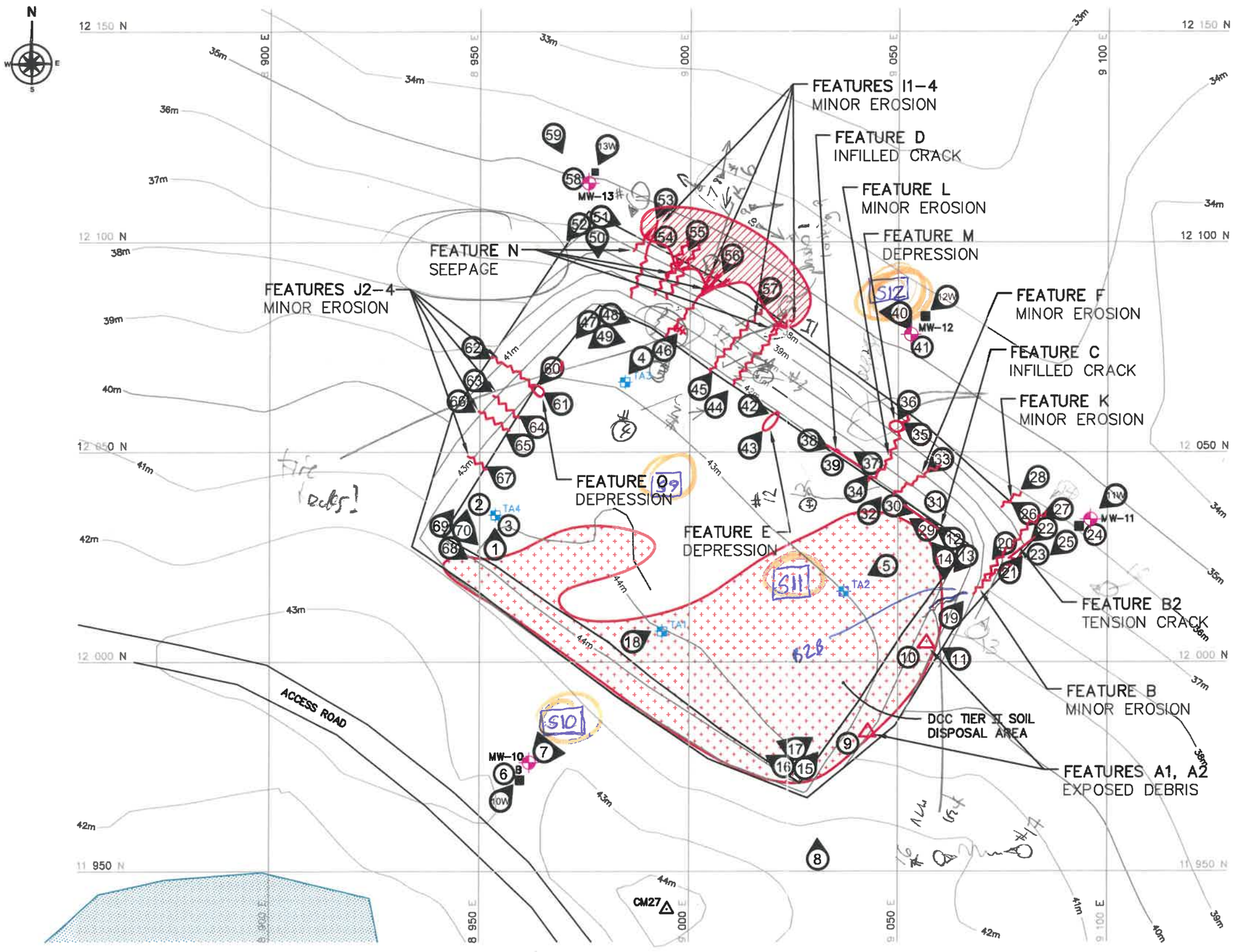
Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone 13	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale CAM-M: T2-
Settlement		not reviewed										
Erosion	I1 = NE slope			7669297.096 – 4944350.791	7	0.3	0.05	<1%	very minor erosion	decrease in length from 18m to 7m	acceptable	- 1, 2, 3, 4, 5, 6
	I2 = NE slope			7669302.233 – 4944342.434	17	0.3	0.05 – 0.1	<1%	minor erosion	NSC	acceptable	
	I3 = NE slope			7669304.194 – 4944339.511	7	0.3	0.05		could be tire tracks originally — very minor erosion	decrease in length from 18m to 7m	acceptable	
	I4 = NE slope			—	not observed			<1%		not observed in 2019	N/A	
Lateral Movement		not reviewed										
Frost Action		not reviewed										
Sloughing		not reviewed										
Cracking	B2	SE corner slope		7669256.570mN 494431.725mE	9	0.2	0.2	<1%	tension crack near toe of L fill	NSC (only 1m greater in length in 2019 vs. 2015)	acceptable	- 13, 14, 15
	B26	on side slope		7669250.054mN 494423.856mE	6	0.1	0.1 – 0.2	<1%	diagonally placed crack on side slope leading towards B2 feature	NEW	acceptable	- 16, 17, 18
Animal Burrows = NO												

NSC = no significant change

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/ Zone 13	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale CAM-M, T2-
Vegetation Establishment	Y			N/A			N/A	30%	sparse vegetation across Tier II L'fill; similar to 2015 inspection	NSC	vegetation growth will aid landfill stability	-4,12
Staining =	NO											
Vegetation Stress =	NO											
Seepage Points (or) Ponded Water	N	N. side slope		7669818.96Tm N 494755.093m E centroid	1.0 or 1.2m	0.15-0.2	—	<2%	4 seepage points - moist area	NSC moist area at toe over ≈ 322m²	acceptable	-4,5,7,8 - seepage near toe of slope - algal growth noted in isolated areas
	N2	N. side slope		7669285.96mN at E end 494+07.45m E centroid	no distinct point soil	seepage - just moist area		<1%		NEW moist area at toe over ≈ 57m²	acceptable	-12 - seepage near toe with excess water draining towards the east
Debris and/or Liner Exposed =	not reviewed											
Presence & Condition of Monitoring Instruments	Y	Monitoring wells							MW-10, -11, 12, -13 all in good condition but with bentonite in casing anticipated (not inspected inside)		acceptable	
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...) =	NO											

NSC = no significant change



LEGEND

- CM27 — TEMPORARY BENCHMARK
- MONITORING WELL LOCATION
- MONITORING SOIL SAMPLE LOCATION
- THERMISTOR LOCATION
- 3 — APPROXIMATE PHOTOGRAPH LOCATION AND PHOTO NUMBER
- SPARSE VEGETATION
- EROSION
- TENSION CRACK
- SEEPAGE POINT
- DEPRESSION HOLE
- WET AREA
- EXPOSED/SURFACE DEBRIS

S10 — Thermal conductivity soil test location, 2019

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	16-03-29	P.L.	A.P.	M.F.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

TIER II DISPOSAL FACILITY

SURVEY CONTROL MONUMENTS

NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
27	11 940.993	8 994.768	44.961	GNWT 500 9018

Englobe
4495, Wilfrid-Hamel boulevard
Suite 200
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Phone : 418.653.4422
www.englobecorp.com

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 1,000	MARCH 2016
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS P. ENG	APPROVED BY: M. FLEURY P. ENG
PROJECT NO: CD2656_500_503	DRAWING NO: CD2656_500_503-CAM-MH	PAGE PL

FIGURE CAM-M.7

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	CAM-M = Airstrip LandFill (inspection of Areas #5, #9, #10, #11 only)
LANDFILL DESIGNATION:	Airstrip LandFill
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	regraded
DATE OF INSPECTION:	29 Aug. 2019
WEATHER CONDITIONS:	4°C, overcast - cloudy, winds from N @ 26 km/hr
DATE OF PREVIOUS INSPECTION:	23 Aug. 2015
INSPECTED BY (name and signature):	T. Austrins,
REPORT PREPARED BY (name and signature):	T. Austrins,

The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; It should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

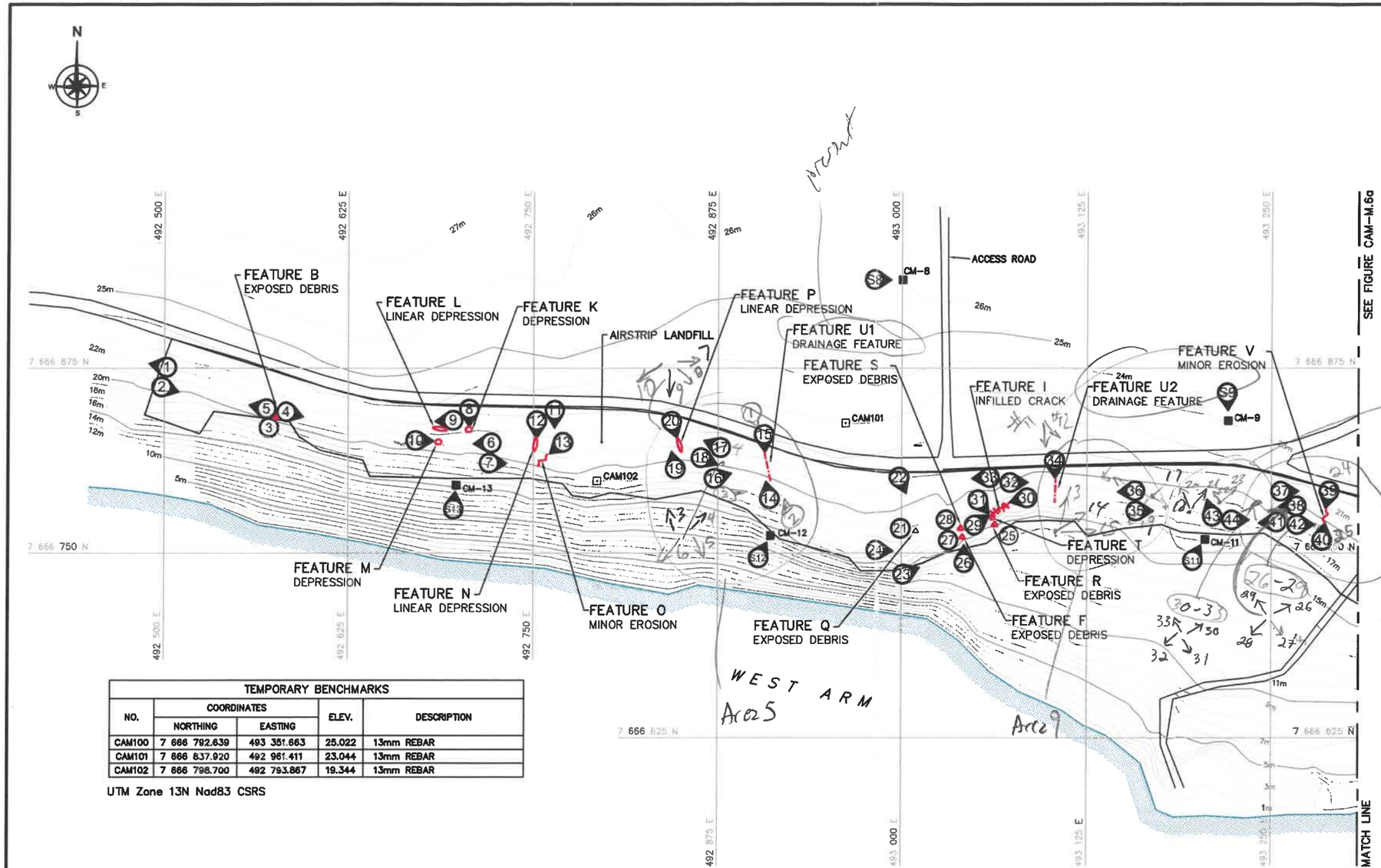
Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone 13	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	P – liner depression (@ Area 4; SE corner)		766827 mE 4492849 mN	3m	0.3	0.15m	<1%	minor depression	NSC	=Area 4 – SE corner =acceptable – cover + side slope appear to be stable	CAM-M, Airs – – no photos (=Area 4)
Erosion	feature =Y	erosion channel		7669773.493 mE 4932281.755 mN	5	0.3–0.5	0.05–0.15	<1%	minor erosion	NSC	Area 11 = acceptable	– 24, 25
Lateral Movement =NO												
Frost Action =NO												
Sloughing =NO												
Cracking =NO												
Animal Burrows =NO												

NSC = no significant change

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone 13	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale CAM-M, Airs –
Vegetation Establishment	Y	sparse veget=	Areas 5,8,11,9	NO					sparse to mod vegetation growth	NSC from 2015 survey	acceptable – vegetation growth will aid in landfill stability.	– 3, 4, 5, 6, 16, 17, 18, 19
Staining	N											
Vegetation Stress	N											
Seepage Points (or) Ponded Water	N											
Debris and/or Liner Exposed	N											
Presence & Condition of Monitoring Instruments	N											
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	Feat. U1	Area 5	7666822.650 mN 492904.879 mE	17	1.0–2.0	0.3	<1%	excavated channel S. of road	NSC	Area 5 – drain channel not in contact with landfill	– 1, 2
	Y	Feat U2	Area 9	7666809.975 mN 493101.815 mE	25	0.3–0.8	0.1–0.3	<1%	excavated channel S. of road	NSC	Area 9 – drain channel not in contact with landfill → both acceptable; not anticipated to cause short-term impact to landfill stability	– 11, 12

NSC = no significant change



TEMPORARY BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CAM100	7 666 792.639	493 351.663	25.022	13mm REBAR
CAM101	7 666 837.920	492 961.411	23.044	13mm REBAR
CAM102	7 666 798.700	492 793.867	19.344	13mm REBAR

UTM Zone 13N Nad83 CSRS

LEGEND

- CAM101 — TEMPORARY BENCHMARK
- MONITORING SOIL SAMPLE LOCATION
- 3 — APPROXIMATE PHOTOGRAPH LOCATION
- EXPOSED/SURFACE DEBRIS
- EROSION
- DEPRESSION / SETTLEMENT

0m 30m 60m 90m 120m 150m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	16-03-29	P.L	A.P.	M.F.

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COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

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Metre	1 : 3,000	MARCH 2016
DRAWN BY:	VERIFIED BY:	APPROVED BY:
P. LÉGARÉ	A. PASSALIS P. ENG	M. FLEURY P. ENG
PROJECT NO:	DRAWING NO:	PAGE
CD2656_500_503	CD2656_500_503-CAM-MG	PL

FIGURE CAM-M.6b

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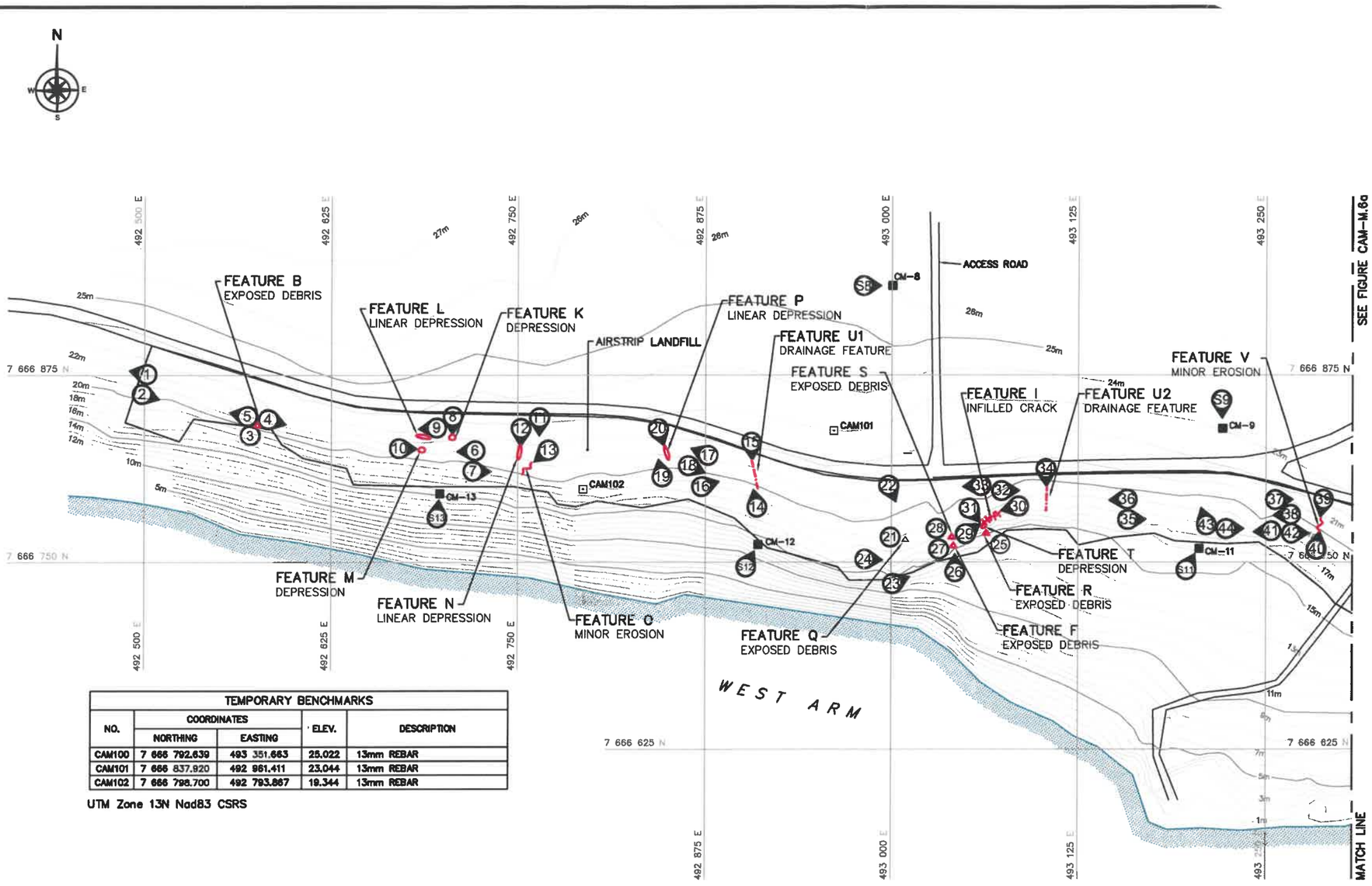

TEMPORARY BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CAM100	7 666 792.639	493 351.663	25.022	13mm REBAR
CAM101	7 666 837.920	492 961.411	23.044	13mm REBAR
CAM102	7 666 798.700	492 793.867	19.344	13mm REBAR

UTM Zone 13N Nad83 CSRS

EXPOSED

EROSION

DEPRESSION / SETTLEMENT

0m 30m 60m 90m 120m 150m

NO.	VERSION	DATE	BY	VERIF.	APPR.
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COLLECTION OF LANDFILL MONITORING DATA

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P. LÉGARÉ	A. PASSALIS P. ENG	M. FLEURY P. ENG
PROJECT NO:	DRAWING NO:	PAGE
CD2656_500_503	CD2656_500_503-CAM-MG	PL

FIGURE CAM-M.6b

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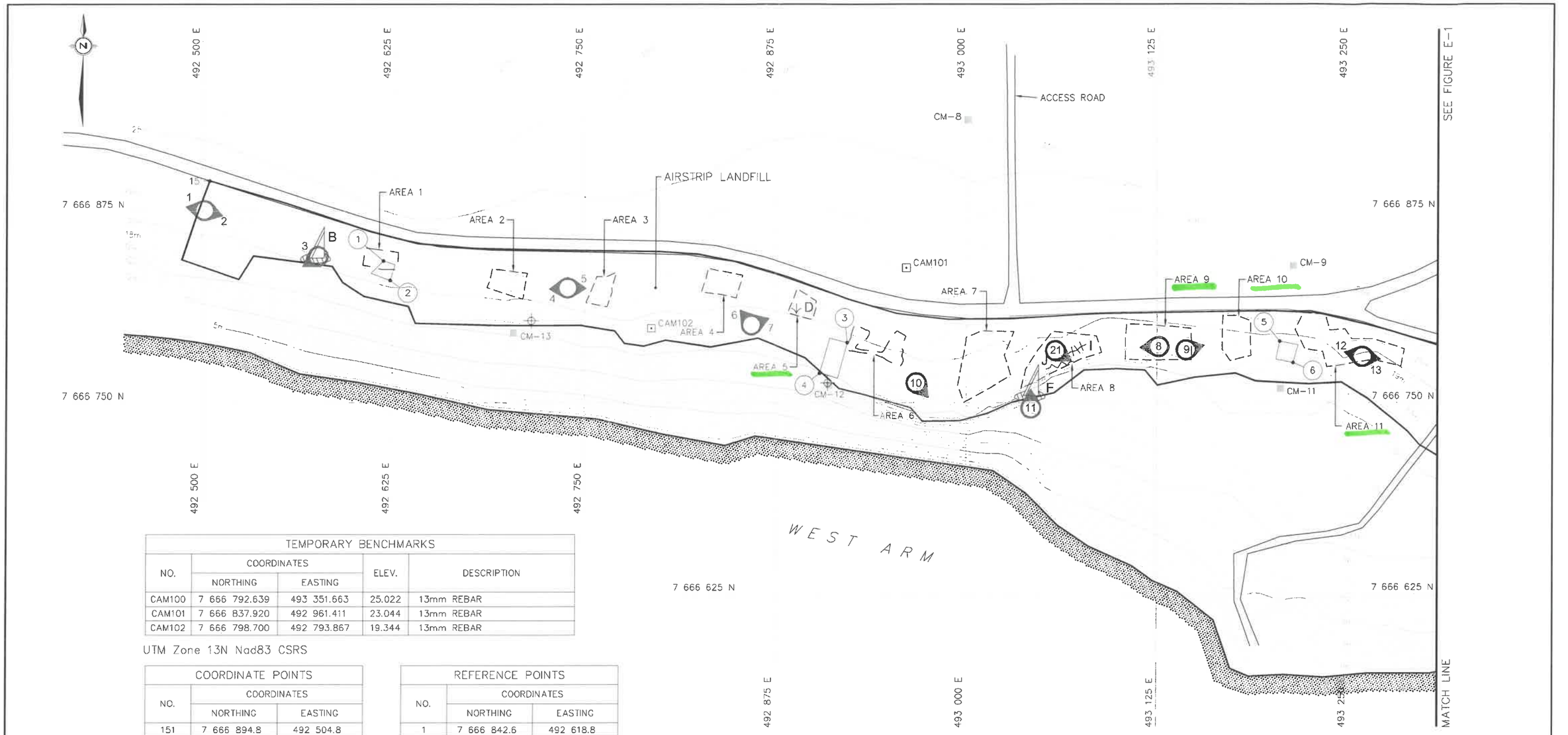


TEMPORARY BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CAM100	7 666 792.639	493 351.663	25.022	13mm REBAR
CAM101	7 666 837.920	492 961.411	23.044	13mm REBAR
CAM102	7 666 798.700	492 793.867	19.344	13mm REBAR

UTM Zone 13N Nad83 CSRS

COORDINATE POINTS		
NO.	COORDINATES	
	NORTHING	EASTING
151	7 666 894.8	492 504.8

MONITORING LOCATIONS		
NO.	COORDINATES	
	NORTHING	EASTING
CM8	7 666 934.7	493 000.4
CM9	7 666 839.4	493 213.5
CM11	7 666 759.2	493 205.6
CM12	7 666 761.9	492 910.4
CM13	7 666 795.8	492 703.7

REFERENCE POINTS		
NO.	COORDINATES	
	NORTHING	EASTING
1	7 666 842.6	492 618.8
2	7 666 829.9	492 623.3
3	7 666 789.3	492 922.2
4	7 666 769.3	492 904.0
5	7 666 790.1	493 204.8
6	7 666 776.2	493 213.4

DATA SOURCES:
DRAWING BY UMA
CM-RD07.DWG
DATED: 04/07/27
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN
CAM-M - CAMBRIDGE BAY
EXISTING AIRSTRIP LANDFILL
FIGURE CAM-M.7

LEGEND

CAM101 TEMPORARY BENCHMARK
1 REFERENCE POINT
151-• COORDINATE POINT
REGRADED AREAS
EXCAVATED AREAS
FORMER CONTAMINATED SOIL AREAS
MONITORING SOIL SAMPLE LOCATION
APPROXIMATE PHOTOGRAPH LOCATION (3=ALF3)
EXPOSED DEBRIS
LIMITED VEGETATION
EROSION
CRACKING / SETTLEMENT
STRESS VEGETATION

1:2500 0 25 50 m

TO BE READ WITH IEG REPORT DATED DECEMBER 2010

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

CLIENT: Defence Construction Canada / Construction de Défense Canada

IEG NUNASI KITNUNA

PROJECT: DEW LINE MONITORING

TITLE: EXISTING AIRPORT LANDFILL

PROJECT No. A07001A01

FIG. No. FIGURE E-2

A07001A01_70517 FIG E-2

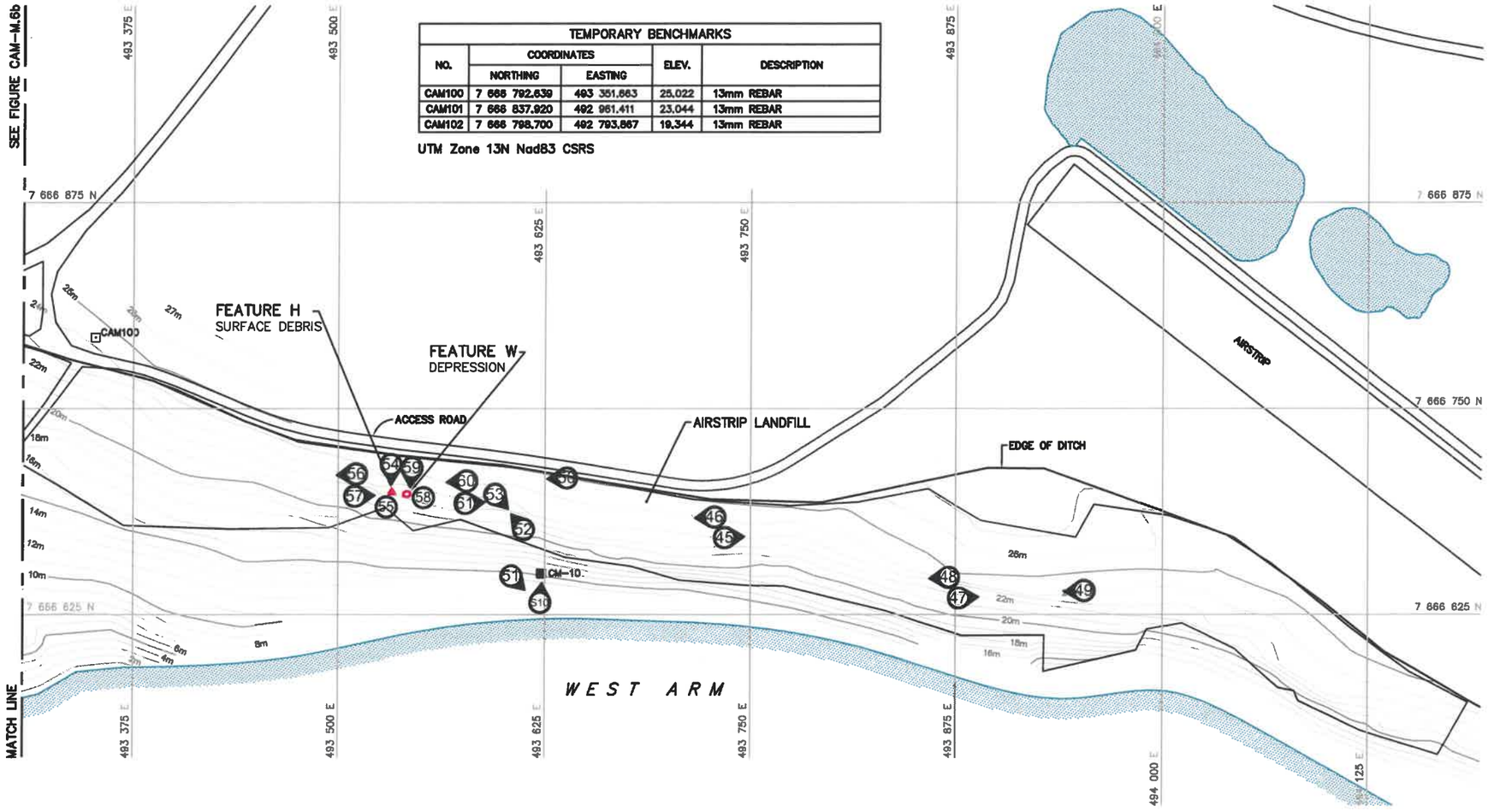
Z:\A\CGY\Alberta\A07001A01 - 2010 Kitik-07 DEW Line Monitoring\400 Drawings\420 Working\Working\ A07001A01_70517 FIG E-2.dwg Layout=FIG E-2 Wednesday, March 09, 2011 8:39:58 AM

N

SEE FIGURE CAM-M.6b

TEMPORARY BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CAM100	7 666 792.639	493 351.663	25.022	13mm REBAR
CAM101	7 666 837.920	492 951.411	23.044	13mm REBAR
CAM102	7 666 798.700	492 793.867	19.344	13mm REBAR

UTM Zone 13N Nad83 CSRS



LEGEND

- CAM100 ⊡ TEMPORARY BENCHMARK
- ■ MONITORING SOIL SAMPLE LOCATION
- (8) APPROXIMATE PHOTOGRAPH LOCATION
- △ EXPOSED/SURFACE DEBRIS
- ○ DEPRESSION / SETTLEMENT

0m 30m 60m 90m 120m 150m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	16-03-29	P.L.	A.P.	M.F.

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COLLECTION OF
LANDFILL MONITORING DATA
CAM-M, CAMBRIDGE BAY, NUNAVUT

AIRSTRIP LANDFILL

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Suite 200
Quebec (Quebec) Canada, G1P 2J7
Phone : 418.653.4422
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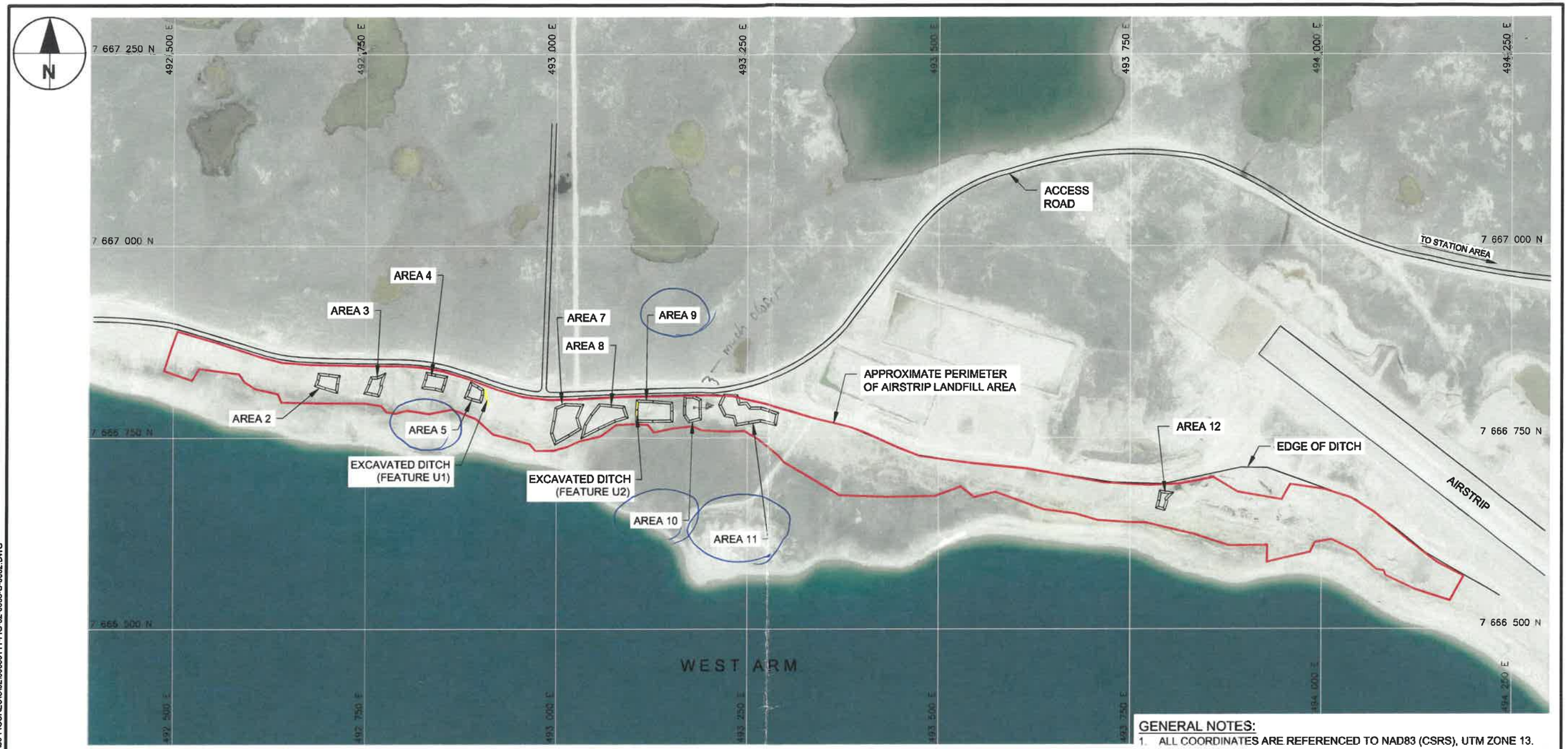
MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 3,000	MARCH 2016
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS P. ENG	APPROVED BY: M. FLEURY P. ENG
PROJECT NO: CD2656_500_503	DRAWING NO: CD2656_500_503-CAM-MF	PAGE PL

FIGURE CAM-M.6a



AERIAL IMAGE PROVIDED BY: © 2019 Microsoft Corporation © 2019 DigitalGlobe © CNES (2019) Distribution Airbus DS bing

0 125 250 m

1:5000

LEGEND:

APPROXIMATE LANDFILL AREA PERIMETER

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 13. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. EXTENTS OF THE LANDFILL AND IDENTIFIED AREAS WERE OBTAINED FROM AECOM DRAWING H-C25/1-9101-109 (DEW LINE CLEAN UP PROJECT - CAM-M CAMBRIDGE BAY AS-BUILT DRAWINGS).
4. LOCATION AND EXTENT OF EXCAVATED DITCHES (FEATURES U1 AND U2) HAVE BEEN ESTIMATED BASED ON FIGURE CAM-M.6b FROM THE DRAFT REPORT ENTITLED "THE COLLECTION OF LANDFILL MONITORING DATA AT THE FORMER CAM-M DISTANT EARLY WARNING LINE SITE".

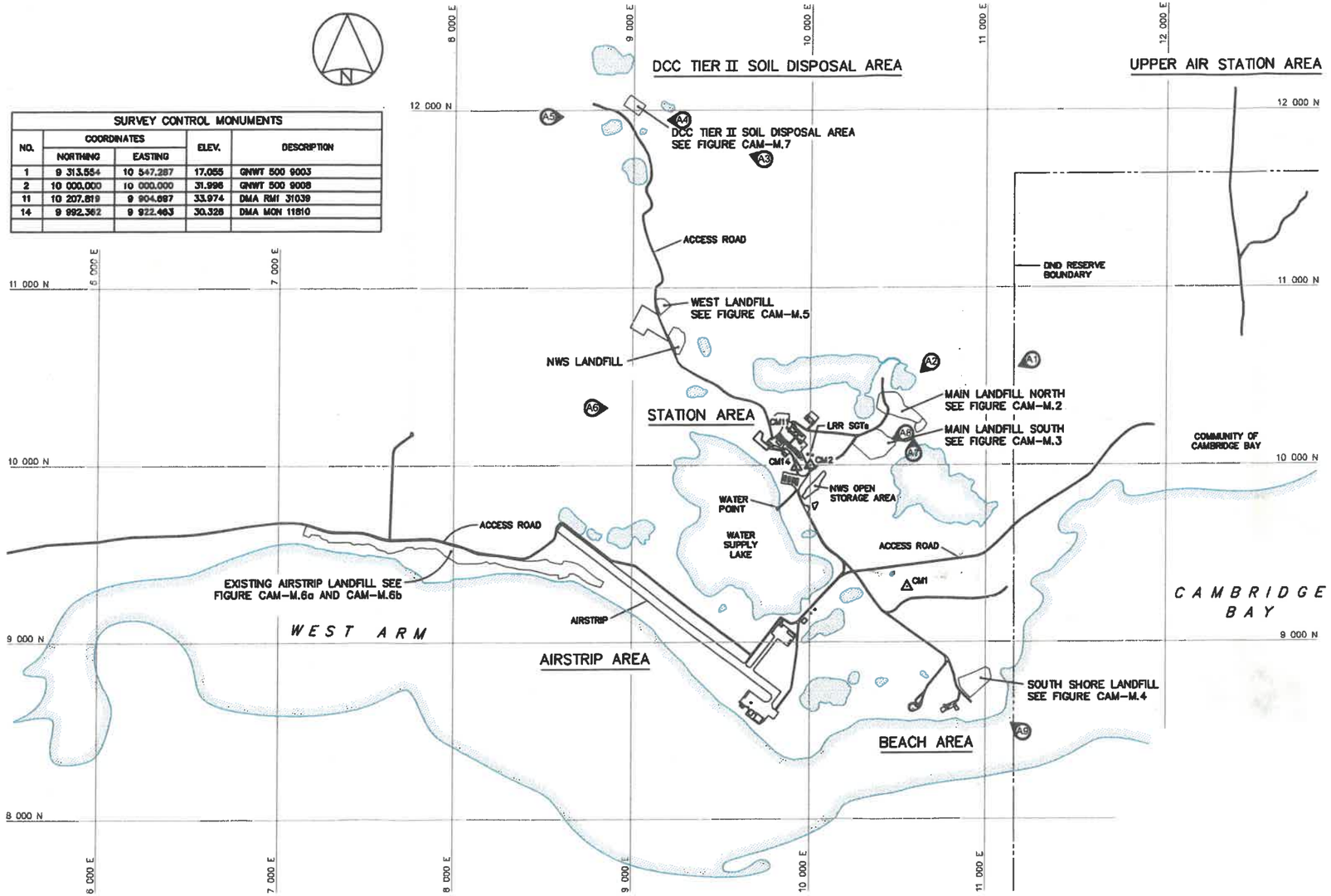
Issue Status: FINAL

CAM-M CAMBRIDGE BAY
LANDFILL MONITORING PROGRAM
DEFENCE CONSTRUCTION CANADA
Project No.: 60600111 Date: 2019-04-26

Airstrip Landfill Area

AECOM

Figure CAM-M.C



SURVEY CONTROL MONUMENTS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
1	9 313.554	10 547.287	17.055	GNWT 500 9003
2	10 000.000	10 000.000	31.996	GNWT 500 9006
11	10 207.819	9 904.697	33.974	DMA RMI 31039
14	9 992.362	9 922.463	30.328	DMA MON 11810

LEGEND

- CM2 △ SURVEY CONTROL MONUMENT
- WATERBODY
- A3 AERIAL PHOTOGRAPH

0m 250m 500m 750m 1000m 1250m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	16-03-04	P.L.	A.P.	M.F.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

OVERALL SITE PLAN

Englobe
4495, Wilfrid-Hamel boulevard
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MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 25,000	MARCH 2016
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS P. ENG	APPROVED BY: M. FLEURY P. ENG
PROJECT NO: CD2655_500_503	DRAWING NO: CD2656_500_503-CAM-MA	PAGE PL

FIGURE CAM-M.1

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DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: CAM-M
LANDFILL DESIGNATION: South Shore Landfill
LANDFILL TYPE (regraded, leachate contained, Tier II or NH): regraded
DATE OF INSPECTION: 29 Aug. 2019
WEATHER CONDITIONS: 4°C, overcast/cloudy, winds from N @ 26 km/hr
DATE OF PREVIOUS INSPECTION: 22 Aug. 2015
INSPECTED BY (name and signature): T. Austin
REPORT PREPARED BY (name and signature): T. Austin
The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; It should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

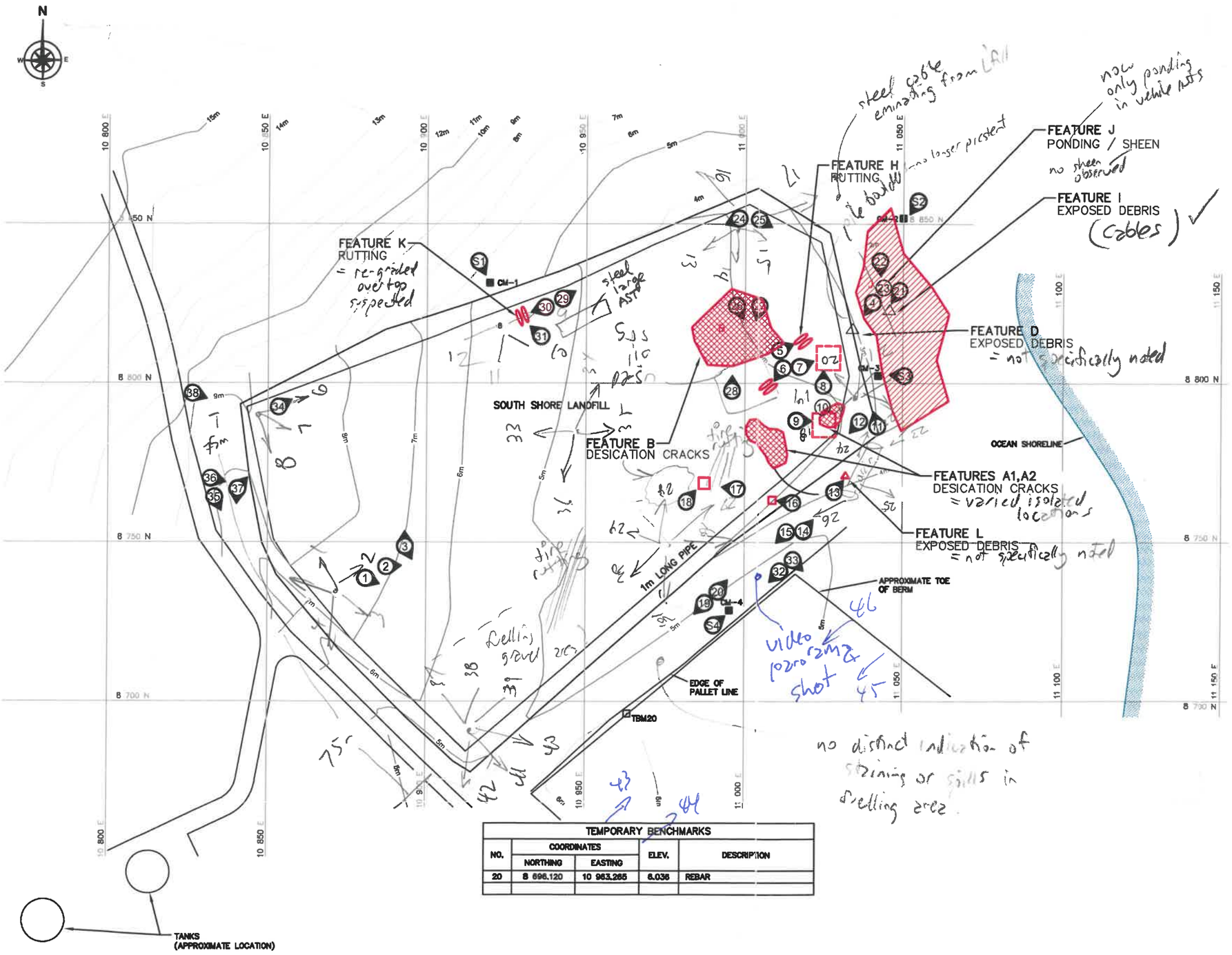
VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	N	see Other Feature re: truck rutting	new re-grading across entire Landfill site						* New re-grading has occurred at this landfill; including the possible addition of granular fill material across much of former S shore Landfill cover area. *			CAM-M, SSL = -1, 2, 3, 6, 7, 8
Erosion	N											
Lateral Movement	N											
Frost Action	N											
Sloughing	N											
Cracking	N											
Animal Burrows	N											

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone 13N	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale CAM-M, SSL –
Vegetation Establishment	= NO											
Staining	= NO											
Vegetation Stress	= NO											
Seepage Points (or) Ponded Water	= YES	J	middle of landfill	7665996.752 4962986.842	54	22	—	5%	ponded water (often in area of tire ruts)	NEW	Acceptable	– 64
Debris and/or Liner Exposed YES	I1	Feature "O"	middle E end of L'fill toe	7666053.280 mN 476385.512 mE	0.7	0.05	N/A	<1%	large embedded steel cable observed	NEW	– acceptable l'fill stability	– ~~17~~, 47 ~~48, 85~~
	I2	Feature "N"	—"—	7666066.248 496344.837	11m	4	1.2 max	ht. <1%	large pile of wood debris from others (construction waste)	NEW	– —"—	– 47, 55, 16
Presence & Condition of Monitoring Instruments	= NO			N/A								
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Yes	Feature "M1"	heavy track tire rutting	7666001.853 mN 496250.835 mE	70m	7m	0.3	1%	numerous tire ruts in landfill cover in N-E to S-W orientation; numerous rutting in other areas of cover also	NEW rutting observed	– acceptable. Inferred that new regrading has occurred, including likely addition of granular fill materials	– 28, 38, 39, 65
	Yes	"M2"	tire ruts	7665996.752 4962986.842	70m	7	0.3	1%				– 28, 38, 39, 64
	Yes	"B"	dessication cracking	7665997.722 mN 4963565.593 mE	18	10	0.1	<1%	dessication cracking at surface observed in truck rutting + other isolated areas	NSC	– acceptable	– 27, 28, 18, 19
	Yes	Feature "P"	SE corner landfill	7666004.045, 496361.667	6m	2m	—	<1%	8 drums on pallets	New	– acceptable	– 15, 21

NSC = no signif. change



TEMPORARY BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
20	8 696.120	10 963.285	6.036	REBAR

LEGEND

- TBM20 — TEMPORARY BENCHMARK
- MONITORING SOIL SAMPLE LOCATION
- 3 — APPROXIMATE PHOTOGRAPH LOCATION AND PHOTO NUMBER
- CONSTRUCTION MATERIAL
- CONSTRUCTION WASTE
- PONDING
- HEAVY EQUIPMENT RUTS
- EXPOSED DEBRIS
- DESSICATION CRACKS

0m 12.5m 25m 37.5m 50m 62.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	16-02-25	P.L.	A.P.	M.F.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

SOUTH SHORE LANDFILL

Englobe
4495, Wilfrid-Hamel boulevard
Suite 200
Quebec (Quebec) Canada, G1P 2J7
Phone : 418.653.4422
www.englobecorp.com

MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 1,250	MARCH 2016
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS P. ENG	APPROVED BY: M. FLEURY P. ENG
PROJECT NO: CD2656_500_503	DRAWING NO: CD2656_500_503-CAM-MD	PAGE PL

FIGURE CAM-M.4

29 Aug 19

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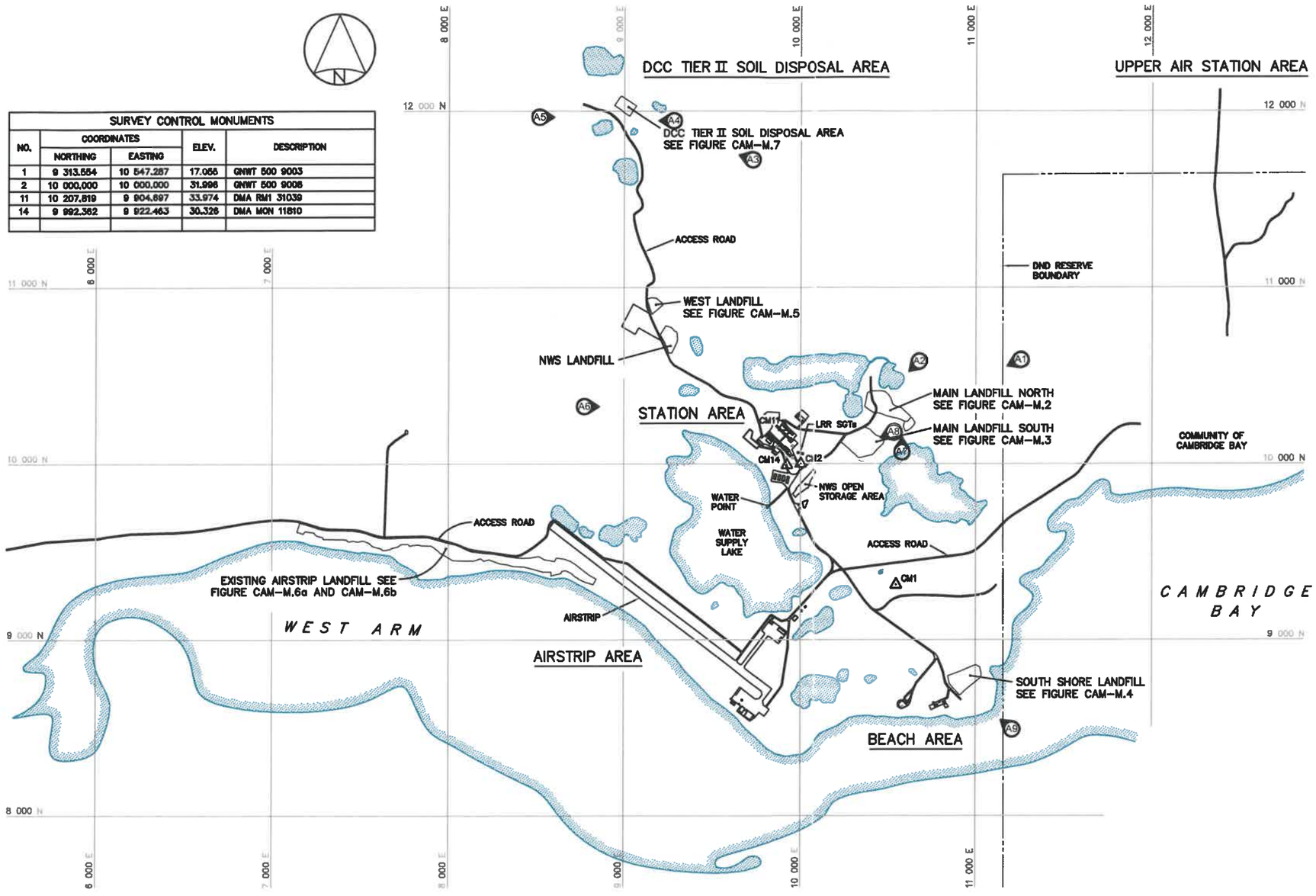
SURVEY CONTROL MONUMENTS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
1	9 313.554	10 547.287	17.055	GNWT 500 9003
2	10 000.000	10 000.000	31.996	GNWT 500 9008
11	10 207.519	9 904.697	33.974	DMA RM1 31039
14	9 992.362	9 922.463	30.326	DMA MON 11810



LEGEND

- CM2 — SURVEY CONTROL MONUMENT
- WATERBODY
- A3 — AERIAL PHOTOGRAPH

0m 250m 500m 750m 1000m 1250m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	16-03-04	P.L.	A.P.	M.F.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

CAM-M, CAMBRIDGE BAY, NUNAVUT

OVERALL SITE PLAN

Englobe
4495, Wilfrid-Hamel boulevard
Suite 200
Quebec (Quebec) Canada, G1P 2J7
Phone : 418.653.4422
www.englobecorp.com

MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 25,000	MARCH 2016
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS P. ENG	APPROVED BY: M. FLEURY P. ENG
PROJECT NO: CD2656_500_503	DRAWING NO: CD2656_500_503-CAM-MA	PAGE PL

FIGURE CAM-M.1

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APPENDIX E

Selected Site Photographs and Photographic Log

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M AIRS-002 (Airstrip Landfill)

Date:

29 August 2019

Description:

View of Feature U1-drainage channel-looking North.

Photo: CAM-M AIRS-008 (Airstrip Landfill)

Date:

29 August 2019

Description:

General view from NW corner of Area 5 landfill – looking East

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M AIRS-012 (Airstrip Landfill)

Date:
29 August 2019

Description:
View of Feature "U2" - drain channel- looking South.

Photo: CAM-M AIRS-023 (Airstrip Landfill)

Date:
29 August 2019

Description:
Middle of Area 10 Landfill- view to NW.

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M AIRS-025 (Airstrip Landfill)

Date:
29 August 2019

Description:
Feature "V"- minor erosion at Area 11 Landfill – view towards south.

Photo: CAM-M AIRS-032 (Airstrip Landfill)

Date:
29 August 2019

Description:
West end of Area 11 Landfill – view towards SE.

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M SSL-006 (South Shore Landfill)

Date:
29 August 2019

Description:
Looking E across Landfill from NW corner of Landfill

Photo: CAM-M SSL-010 (South Shore Landfill)

Date:
29 August 2019

Description:
Looking SE across landfill structure from Northwest quadrant of landfill, north end.

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M SSL-14 (South Shore Landfill)

Date:
29 August 2019

Description:
Looking S from middle east end of landfill (view of drum compound) from middle east end of landfill

Photo: CAM-M SSL-20 (South Shore Landfill)

Date:
29 August 2019

Description:
Looking N from SE corner of landfill; note Seacans, trailer and wood construction debris in background.

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M SSL-28 (South Shore Landfill)

Date:

29 August 2019

Description:

View of Feature "M2"- truck rutting / ponding -looking N from middle of landfill

Photo: CAM-M SSL-62 (South Shore Landfill)

Date:

29 August 2019

Description:

View to SW from NW corner of fenced tote co mpound; note new fuelling area and tank farm. Desiccation cracking in foreground.

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M T2-003 (Tier II Disposal Facility)

Date:
29 August 2019

Description:
Tier II Disposal Facility- NE slope; west end of landfill –looking NE

Photo: CAM-M T2-006 (Tier II Disposal Facility)

Date:
29 August 2019

Description:
Tier II Disposal Facility- NE slope; west end of landfill –looking towards NE.

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M T2-009 (Tier II Disposal Facility)

Date:
29 August 2019

Description:
NE slope; west end of landfill; note moist seepage area (Feature N) in foreground- looking North.

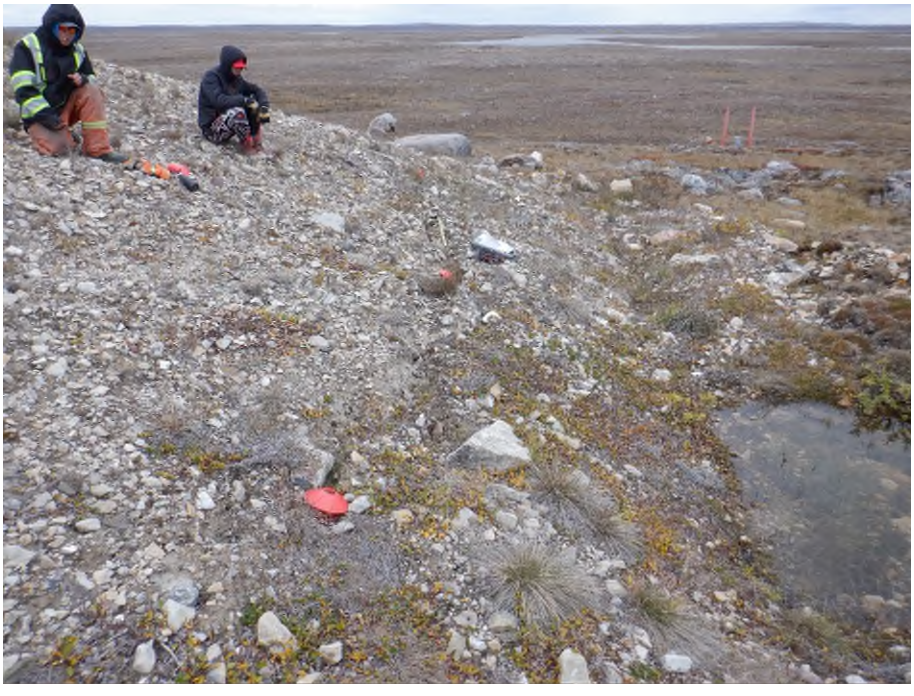

Photo: CAM-M T2-015 (Tier II Disposal Facility)

Date:
29 August 2019

Description:
View of tension crack B & B2- looking NE at SE slope of landfill.

Project Photographs

CAM-M Select Site Visual Inspection Photographs
29 August 2019

Photo: CAM-M T2-019 (Tier II Disposal Facility)

Date:
29 August 2019

Description:
View of tension crack B2b on SE slope, east end, of landfill– looking SW.

Photo: CAM-M T2-011 (Tier II Disposal Facility)

Date:
29 August 2019

Description:
View to SE of seepage (Feature N1&N2) at west end of landfill at toe of NE slope.

Appendix E: CAM-M Photo Log

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
SOUTH SHORE LANDFILL											
SSL-0	0	-	cover sheet	-	none	cover sheet; South Shore Landfill at CAM-M	-	-	2194	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-1	1	N	NW quadrant; W end	-	Landfill edge	Looking N across NW corner of Landfill	7665994.856	496189.275	4751	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-2	2	E	NW quadrant; W end	-	Landfill structure	Looking E across Landfill	7665994.856	496189.275	4504	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-3	3	S	NW quadrant; W end	-	Landfill edge	Looking S across Landfill edge	7665994.856	496189.275	4747	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-4	4	SW	NW quadrant; W end	-	Landfill edge	Looking SW onto adjacent lands and roadway	7665994.856	496189.275	4708	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-5	5	NW	NW quadrant; W end	-	Landfill edge	Looking NW towards adjacent lands and roadway	7665994.856	496189.275	4678	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-6	6	E	NW corner of landfill	-	Landfill edge	Looking E across Landfill	7666029.438	496178.249	4723	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-7	7	SE	NW corner of landfill	-	Landfill structure	Looking SE across landfill body	7666029.438	496178.249	4811	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-8	8	S	NW corner of landfill	-	Landfill edge	Looking S across landfill	7666029.438	496178.249	4859	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-9	9	E	Northwest quadrant of landfill, north end	-	Landfill edge	Looking E across landfill edge	7666035.286	496245.35	4712	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-10	10	SE	Northwest quadrant of landfill, north end	-	Landfill structure	Looking SE across landfill structure	7666035.286	496245.35	4862	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-11	11	SW	Northwest quadrant of landfill, north end	-	Landfill structure	looking SW across landfill	7666035.286	496245.35	4699	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-12	12	W	Northwest quadrant of landfill, north end	-	Landfill edge	Looking W across landfill edge	7666035.286	496245.35	4618	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-13	13	W	Middle east end of landfill	-	Landfill structure	Looking W from middle east end of landfill	7666037.981	496358.574	4902	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-14	14	S	Middle east end of landfill	-	Landfill structure	Looking S from middle east end of landfill (view of drum compound)	7666037.981	496358.574	4384	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-15	15	SE	Middle east end of landfill	-	Landfill structure	200L drums on pallets (grouping of 8 and group of 20)	7666037.981	496358.574	4328	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-16	16	NW	Middle east end of landfill	wood debris	Landfill structure	Photo of construction debris wood pile created by others recently	7666037.981	496358.574	4326	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-17	17	NE	Middle east end of landfill	-	Landfill structure	looking NE from middle east end of landfill	7666037.981	496358.574	4006	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-18	18	SW	SE corner of landfill	former A1/A2	Landfill structure	former Feature "A1/A2"- desiccation cracking; none observed in 2019	7665997.722	496356.503	4676	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-19	19	W	SE corner of landfill	former A1/A2	Landfill structure	former Feature "A1/A2"- desiccation cracking; none observed in 2019	7665997.722	496356.503	4687	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-20	20	N	SE corner of landfill	former A1/A2	Landfill structure	former Feature "A1/A2"- desiccation cracking; none observed in 2019	7665997.722	496356.503	4243	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
SSL-21	21	NE	SE corner of landfill	-	Landfill edge	200L drums on pallet	7665997.722	496356.503	4230	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-22	22	E	SE corner of landfill	-	Landfill edge	Looking E from SE corner of landfill	7665997.722	496356.503	4779	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-23	23	W	East side of culvert; looking west	-	culvert	East side of culvert; looking west	7666011.504	496394.589	4441	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-24	24	E	On culvert; looking East	-	culvet channel	On culvert; looking East	7665989.895	496373.7	4135	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-25	25	W	West side of culvert; looking west	-	culvet channel	West side of culvert; looking west	7665984.853	496361.454	4439	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-26	26	SE	On culvert;looking SE	-	Landfill structure	On culvert;looking SE	7665981.614	496351.035	4625	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-27	27	E	Middle of landfill	-	Landfill structure	Looking east from middle of landfill	7665992.635	496285.945	4746	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-28	28	N	Middle of landfill	M2 & O	Rutting & ponding	View of Feature "M2"- truck rutting/ ponding	7665992.635	496285.945	3541	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-29	29	NW	Middle of landfill	-	Landfill structure	looking NW from middle of landfill	7665992.635	496285.945	3871	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-30	30	W	Middle of landfill	-	Landfill structure	looking W from middle of landfill	7665992.635	496285.945	4175	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-31	31	SW	Middle of landfill	-	Landfill structure	Looking SW from middle of landfill	7665992.635	496285.945	4228	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-32	32	SE	Middle of landfill	-	Landfill structure	Looking SE from middle of landfill	7665992.635	496285.945	4031	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-33	33	W	NW of middle of landfill	-	Landfill structure	Looking W from NW of middle of landfill	7666016.362	496264.124	4906	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-34	34	NE	NW of middle of landfill	-	Landfill structure	Looking NE from NW of middle of landfill	7666016.362	496264.124	4626	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-35	35	E	NW of middle of landfill	-	Landfill structure	Looking E from NW of middle of landfill	7666016.362	496264.124	3890	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-36	36	S	NW of middle of landfill	-	Landfill structure	Looking S from NW of middle of landfill	7666016.362	496264.124	4431	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-37	37	N	Middle West end of Landfill	-	Landfill edge	Looking N from NW of middle of landfill	7665963.263	496204.101	4602	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-38	38	NE	Middle West end of Landfill	M1	Truck rutting	View of Feature "M1"- truck rutting	7665963.263	496204.101	4423	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-39	39	E	Middle West end of Landfill	M1	Truck rutting	View of Feature "M1"- truck rutting	7665963.263	496204.101	4498	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-40	40	SE	Middle West end of Landfill	-	Landfill structure	looking SE from middle west end of landfill	7665963.263	496204.101	3133	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-41	41	S	Middle West end of Landfill	-	Landfill edge	looking S from middle west end of landfill	7665963.263	496204.101	3657	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-42	42	SW	Middle West end of Landfill	-	Landfill edge	looking SW from middle west end of landfill	7665963.263	496204.101	4492	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
SSL-43	43	E	Fuelling area; NW corner- view towards East	-	Fuelling area	view of fuelling area	7665942.355	496226.757	3839	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-44	44	E	Fuelling area; SW corner- view towards E	-	Fuelling area	view of fuelling area	7665931.55	496233.24	3581	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-45	45	W	Fuelling area; SE corner- view towards W	-	Fuelling area	view of fuelling area	7665953.88	496280.06	4205	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-46	46	W	Fuelling area; NE corner- view towards W	-	Fuelling area	view of fuelling area	7665956.761	496274.297	3562	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-47	47	NW	Middle East end beyond landfill	N	embedded cable	Detail of Feature "N"- embedded steel cable	7666053.28	496385.512	4007	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-48	48	W	Middle East end beyond landfill	-	Landfill edge	View towards W at middle E end beyond landfill	7666053.28	496385.512	4205	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-49	49	SW	Middle East end beyond landfill	-	Landfill edge	View towards SW at middle E end beyond landfill	7666053.28	496385.512	4189	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-50	50	S	Middle East end beyond landfill	-	Landfill edge	View towards S at middle E end beyond landfill	7666053.28	496385.512	4361	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-51	51	SE	Middle East end beyond landfill	-	Landfill edge	View towards SE at middle E end beyond landfill	7666053.28	496385.512	4836	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-52	52	E	Middle East end beyond landfill	-	Landfill edge	View towards E at middle E end beyond landfill	7666053.28	496385.512	4890	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-53	53	NE	Middle East end beyond landfill	-	Landfill edge	View towards NE at middle E end beyond landfill	7666053.28	496385.512	4531	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-54	54	N	Middle East end beyond landfill	-	Landfill edge	View towards N at middle E end beyond landfill	7666053.28	496385.512	4184	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-55	55	NW	Middle East end beyond landfill	-	wood debris pile	recent construction debris wood pile	7666053.28	496385.512	4384	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-56	56	W	East of culvert; view towards W	-	culvert	view of culvert	7666010.394	496390.558	4355	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-57	57	S	NW corner of fenced totes compound	-	Landfill structure	View to S from NW corner of fenced tote compound	7666022.448	496337.28	4637	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-58	58	E	NW corner of fenced totes compound	J	Desiccation cracking	View to E from NW corner of fenced tote compound	7666022.448	496337.28	4313	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-59	59	N	NW corner of fenced totes compound	J	Desiccation cracking	View to N from NW corner of fenced tote compound	7666022.448	496337.28	3628	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-60	60	NW	NW corner of fenced totes compound	J	Desiccation cracking	View to NW from NW corner of fenced tote compound	7666022.448	496337.28	3601	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-61	61	W	NW corner of fenced totes compound	J	Desiccation cracking	View to W from NW corner of fenced tote compound	7666022.448	496337.28	3680	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-62	62	SW	NW corner of fenced totes compound	J	Desiccation cracking	View to SW from NW corner of fenced tote compound	7666022.448	496337.28	3996	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-63	63	S	NW corner of fenced totes compound	J	Desiccation cracking	View to S from NW corner of fenced tote compound	7666022.448	496337.28	4259	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
SSL-64	64	NE	Middle of landfill; looking NE along tire rutting	M2 and O	Ponding/ rutting	Middle of landfill; looking NE along tire rutting- Feature J- ponding	7665996.752	496286.842	3837	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-65	65	NE	West end of landfill; looking NE along tire rutting	M1	Truck rutting	West end of landfill; looking NE along tire rutting- Feature M1	7666001.853	496250.835	4399	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-66	66	E	West side of Fuelling area	-	Fuelling area	View to East of Fuelling area	7665930.368	496226.213	3968	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
SSL-video	Vid	Vid	Panoramic video	-	video	Panoramic Video just SW of middle of landfill	7665976.976	496265.821	268,461	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
TIER II DISPOSAL FACILITY											
T2-001	1	-	cover sheet	-	-	cover sheet; Tier II Disposal Facility: CAM-M	-	-	2435	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-002	2	SW	Slope erosion on NE slope; west end of landfill	na	erosion	Slope erosion on NE slope; west end of landfill- not part of 2019 work scope	7669312.219	494357.169	4626	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-003	3	NE	Slope erosion on NE slope; west end of landfill	na	erosion	Slope erosion on NE slope; west end of landfill- not part of 2019 work scope	7669297.096	494350.791	4681	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-004	4	NE	Slope erosion on NE slope; west end of landfill	na	erosion	Slope erosion on NE slope; west end of landfill- not part of 2019 work scope	7669304.414	494352.918	4755	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-005	5	SW	Slope erosion on NE slope; west end of landfill	na	erosion	Slope erosion on NE slope; west end of landfill- not part of 2019 work scope	7669298.91	494347.601	4703	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-006	6	NE	Slope erosion on NE slope; west end of landfill	na	erosion	Slope erosion on NE slope; west end of landfill- not part of 2019 work scope	7669304.194	494339.511	4768	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-007	7	SW	Slope erosion on NE slope; west end of landfill	na	erosion	Slope erosion on NE slope; west end of landfill- not part of 2019 work scope	7669318.613	494348.314	4768	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-008	8	NW	Features N1&N2 moist toe of slope; west end of landfill	N1/N2	Landfill edge	Features N1&N2- moist toe of slope & slope erosion on NE slope; west end of landfill	7669318.613	494348.314	4700	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-009	9	N	NE slope; west end of landfill	N1/N2	Landfill edge-seepage area	NE slope; west end of landfill; note moist seepage area in foreground.	7669318.613	494348.314	4675	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-010	10	E	NE slope; west end of landfill	-	Landfill edge	View to E of seepage at west end of landfilll at toe of NE slope	7669318.613	494348.314	4797	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-011	11	SE	NE slope; west end of landfill	N1/N2	seepage	View to SE of seepage at west end of landfilll at toe of NE slope	7669318.613	494348.314	4906	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-012	12	S	NE slope; west end of landfill	-	Landfill structure	View to S of NE landfill slope	7669334.627	494330.999	4617	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-013	13	SSE	NE slope; west end of landfill	-	erosion	View to SSE of NE slope of landfill	7669334.627	494330.999	4676	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-014	14	N	NE landfill slope, east end	N3	seepage	View of seepage at toe of NE slope; east end of landfill	7669268.643	494402.234	4768	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-015	15	NE	East end of landfill; north side	B	Landfill slope-tension crack	View of Tension Crack Feature B- looking towards tension crack Feature B2	7669246.117	494427.124	4757	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-016	16	SW	East end of landfill; north side	B2	Landfill slope-tension crack	View of tension crack B2	7669256.97	494431.705	4741	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-017	17	W	East end of landfill; north side	B2	Landfill slope-tension crack	View of tension crack B2	7669250.062	494439.031	4883	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
T2-018	18	NE	East end of landfill; north side	B2b	Landfill slope tension crack	View of tension crack B2b	7669246.189	494417.61	4764	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
T2-019	19	SW	East end of landfill; north side	B2b	Landfill slope tension crack	View of tension crack B2b	7669252.047	494426.152	4798	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
AIRSTRIP LANDFILL (Areas 5, 9, 10, 11 only)											
AIRS-000	0	-	cover sheet	-	-	cover sheet; Airstrip Landifll- CAM-M	-	-	2580	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-001	1	S	Area 5- drainage channel Feature U1	U1	drainage channel	Looking south at drainage channel	7666822.65	492904.899	4618	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-002	2	N	Area 5- drainage channel Feature U1	U1	drainage channel	Looking north at drainage channel	7666799.843	492905.301	4681	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-003	3	NE	Area 5- Landfill surface	-	landfill surface	General view of Area 5 landfill surface	7666811.957	492891.21	4755	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-004	4	SE	Area 5- Landfill surface	-	landfill surface	General view of Area 5 landfill surface	7666811.957	492891.21	4830	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-005	5	SW	Area 5- Landfill surface	-	landfill surface	General view of Area 5 landfill surface	7666811.957	492891.21	4830	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-006	6	NW	Area 5- Landfill surface	-	landfill surface	General view of Area 5 landfill surface	7666811.957	492891.21	4707	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-007	7	N	Area 5- Landfill surface	-	landfill surface	General view of Area 5 landfill surface	7666811.957	492891.21	4788	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-008	8	E	NW corner of Area 5 Landfill	-	landfill surface	General view from NW corner of Area 5 landfill	7666826.455	492880.933	4690	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-009	9	SE	NW corner of Area 5 Landfill	-	landfill surface	General view from NW corner of Area 5 landfill	7666826.455	492880.933	4731	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-010	10	S	NW corner of Area 5 Landfill	-	landfill surface	General view from NW corner of Area 5 landfill	7666826.455	492880.933	4704	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-011	11	SW	NW corner of Area 5 Landfill		landfill surface	General view from NW corner of Area 5 landfill	7666826.455	492880.933	4780	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-012	12	S	Drainage channel- Feature U2	U2	drainage channel	View of Feature "U2" -drain channel	7666809.945	493101.815	4891	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-013	13	SE	Drainage channel- Feature U2	U2	drainage channel	View of Feature "U2" -drain channel	7666809.945	493101.815	4729	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-014	14	N	West end Area 9 landfill	-	landfill surface	View of Area 9 Landfill	7666780.28	493104.46	4702	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-015	15	NE	West end Area 9 landfill	-	landfill surface	View of Area 9 Landfill	7666780.28	493104.46	4912	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-016	16	E	West end Area 9 landfill	-	landfill surface	View of Area 9 Landfill	7666780.28	493104.46	4797	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-017	17	NW	middle of Area 9 Landfill	-	landfill surface	View from middle of Area 9 landfill	7666790.189	493141.568	4750	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-018	18	NE	middle of Area 9 Landfill	-	landfill surface	View from middle of Area 9 landfill	7666790.189	493141.568	4709	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-019	19	SE	middle of Area 9 Landfill	-	landfill surface	View from middle of Area 9 landfill	7666790.189	493141.568	4879	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-020	20	SW	middle of Area 9 Landfill	-	landfill surface	View from middle of Area 9 landfill	7666790.189	493141.568	4698	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel

Appendix E: CAM-M Photo Log

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
AIRS-021	21	NW	south end of Area 10 Landfill	-	landfill surface	south end of Area 10 Landfill; view to NW	7666779.915	493180.99	4730	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-022	22	NE	south end of Area 10 Landfill	-	landfill surface	south end of Area 10 Landfill; view to NE	7666779.915	493180.99	4810	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-023	23	NW	Location between Area 10 and Area 11 Landfill	-	landfill surface	Location between Area 10 and Area 11 Landfill; view to NW	7666780.546	493206.906	4799	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-024	24	NE	Location between Area 10 and Area 11 Landfill	-	landfill surface	Location between Area 10 and Area 11 Landfill; view to NE	7666780.546	493206.906	4694	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-025	25	S	Feature V- minor erosion at Area 11 Landfill	V	minor erosion	Feature V- minor erosion at Area 11 Landfill	7666773.493	493281.755	4673	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-026	26	N	Feature V- minor erosion at Area 11 Landfill	V	minor erosion	Feature V- minor erosion at Area 11 Landfill	7666773.493	493281.755	4823	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-027	27	NE	middle of Area 11 Landfill	-	landfill surface	middle of Area 11 Landfill	7666779.259	493271.16	4821	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-028	28	SE	middle of Area 11 Landfill	-	landfill surface	middle of Area 11 Landfill	7666779.259	493271.16	4769	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-029	29	SW	middle of Area 11 Landfill	-	landfill surface	middle of Area 11 Landfill	7666779.259	493271.16	4752	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-030	30	NW	middle of Area 11 Landfill	-	landfill surface	middle of Area 11 Landfill	7666779.259	493271.16	4728	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-031	31	NE	West end of Area 11 Landfill	-	landfill surface	West end of Area 11 Landfill	7666790.243	493233.473	4649	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-032	32	SE	West end of Area 11 Landfill	-	landfill surface	West end of Area 11 Landfill	7666790.243	493233.473	4673	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-033	33	SW	West end of Area 11 Landfill	-	landfill surface	West end of Area 11 Landfill	7666790.243	493233.473	4800	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
AIRS-034	34	NW	West end of Area 11 Landfill	-	landfill surface	West end of Area 11 Landfill	7666790.243	493233.473	4659	2019.08.29	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM Northing	UTM Easting	Photo Size KB	Date of Photo	Camera Information
AIR PHOTOS- AIRSTRIP/ SOUTH SHORE/ MAIN/ TIER II LANDFILLS											
CM-A1	A1	NW	Southeast of Southshore Landfill	-	Southshore Landfill	Aerial of South Shore Landfill	7665731.838	496110.4757	3888	2018.08.28	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
CM-A2	A2	NE	Southwest of Airstrip Landfill	-	Airstrip Landfill	Aerial of Airstrip Landfill	7666484.567	492678.3044	3956	2018.08.28	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
CM-A3	A3	NE	Southeast of Main Landfill	-	Main Landfill	Aerial of Main Landfill	7667224.393	495458.9661	722	2018.08.28	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
CM-A4	A4	N	South of Southshore Landfill	-	Southshore Landfill	Aerial of South Shore Landfill	7665780.519	496331.7961	3903	2018.08.28	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
CM-A5	A5	NNE	South of Airstrip Landfill	-	Airstrip Landfill	Aerial of Airstrip Landfill	7666471.513	493040.2851	3956	2018.08.28	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
CM-A6	A6	NE	Southwest of Tier II Landfill	-	Tier II Landfill	Aerial of Tier II Landfill	7669081.121	493906.9203	605	2018.08.28	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 Mpixel
THERMISTOR PHOTOGRAPHS											
MAIN LANDFILL NORTH- Thermistor Photographs											
CM-MLN-ITN1-1	1	NNE	Thermistor ITN1	ITN1	Main Landfill North	Close-up of casing	7667590.699	495845.4913	3951	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos sensor
CM-MLN-ITN1-2						View of Thermistor			3976	2019.08.24	
CM-MLN-ITN1-3						Connection close-up			3960	2019.08.24	
CM-MLN-ITN2-1	2	N	Thermistor ITN2	ITN2	Main Landfill North	Close-up of casing	7667528.048	495893.752	3931	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-MLN-ITN2-2						View of Thermistor			4010	2019.08.24	
CM-MLN-ITN2-3						Connection close-up			3715	2019.08.24	
CM-MLN-VT1-1	3	NNE	Thermistor VT1	VT1	Main Landfill North	View of Thermistor	7667582.647	495759.8673	6201	2019.08.14	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-MLN-VT1-2						Close-up of casing			6638	2019.08.14	
CM-MLN-VT1-3						Inside casing			6495	2019.08.14	
CM-MLN-VT1-4						Inside casing			6107	2019.08.14	
CM-MLN-VT2-1	4	WNW	Thermistor VT2	VT2	Main Landfill North	Close-up of casing	7667506.81	495922.4814	4002	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-MLN-VT2-2						View of Thermistor			3941	2019.08.24	
CM-MLN-VT2-3						Connection close-up			3698	2019.08.24	
CM-MLN-VT3-1	5	NE	Thermistor VT3	VT3	Main Landfill North	View of Thermistor	7667557.114	495856.5556	4048	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-MLN-VT3-2						Close-up of casing			3981	2019.08.24	
CM-MLN-VT3-3						Connection close-up			3715	2019.08.24	
MAIN LANDFILL SOUTH -Thermistor Photographs											
CM-MLS-ITS1-1	1	SE	Thermistor ITS1	ITS1	Main Landfill South	Close-up of casing	7667341.507	495786.5841	3987	2019.08.14	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-MLS-ITS1-2						View of Thermistor			4014	2019.08.14	
CM-MLS-ITS1-3						Inside casing			3796	2019.08.14	
CM-MLS-ITS1-4						Connection close-up			3932	2019.08.14	
CM-MLS-ITS2-1	2	SSW	Thermistor ITS2	ITS2	Main Landfill South	View of Thermistor	7667296.942	495743.5868	4076	2019.08.14	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-MLS-ITS2-2						Close-up of casing			3989	2019.08.14	
CM-MLS-ITS2-3						Inside casing			3728	2019.08.14	
CM-MLS-ITS2-4						Connection close-up			3924	2019.08.14	
CM-MLS-VT4-1	3	WNW	Thermistor VT4	VT4	Main Landfill South	Inside casing	7667336.615	495738.4733	3668	2019.08.14	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-MLS-VT4-2						View of Thermistor			3946	2019.08.14	
CM-MLS-VT4-3						Close-up of casing			4006	2019.08.14	
CM-MLS-VT4-4						Connection close-up			3974	2019.08.14	
CM-MLS-VT5-1	4	SSW	Thermistor VT5	VT5	Main Landfill South	Close-up of casing	7667291.312	495748.0332	4075	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-MLS-VT5-2						View of Thermistor			4045	2019.08.24	
CM-MLS-VT5-3						Connection close-up			3811	2019.08.24	

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM Northing	UTM Easting	Photo Size KB	Date of Photo	Camera Information
TIER II DISPOSAL FACILITY - Thermistor Photographs											
CM-T2-TA1-1	20	NNE	Thermistor TA1	TA1	Tier II Landfill	Close-up of casing	7669225.251	494334.598	3983	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-T2-TA1-2						View of Thermistor			4008	2019.08.24	
CM-T2-TA1-3						Inside casing			3603	2019.08.24	
CM-T2-TA1-4						Connection close-up			3853	2019.08.24	
CM-T2-TA2-1	21	W	Thermistor TA2	TA2	Tier II Landfill	Close-up of casing	7669241.235	494390.9196	4003	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-T2-TA2-2						View of Thermistor			3994	2019.08.24	
CM-T2-TA2-3						Inside casing			3589	2019.08.24	
CM-T2-TA2-4						Connection close-up			3803	2019.08.24	
CM-T2-TA3-1	22	SE	Thermistor TA3	TA3	Tier II Landfill	Close-up of casing	7669299.175	494326.9035	3985	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-T2-TA3-2						View of Thermistor			3901	2019.08.24	
CM-T2-TA3-3						Inside casing			3894	2019.08.24	
CM-T2-TA3-4						Connection close-up			3712	2019.08.24	
CM-T2-TA4-1	23	ESE	Thermistor TA4	TA4	Tier II Landfill	Close-up of casing	7669262.037	494291.2992	4003	2019.08.24	Fuji Film Finepix XP70, F3.9, Aspect Ratio 4:3, 16 MPcmos senso
CM-T2-TA4-2						View of Thermistor			4008	2019.08.24	
CM-T2-TA4-3						Inside casing			3598	2019.08.24	
CM-T2-TA4-4						Connection close-up			3926	2019.08.24	

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