Environmental Protection Plan

Cambridge Bay Soil and Water Treatment Facility

Kitikmeot Environmental Ltd.



ENVIRONMENTAL PROTECTION PLAN

FINAL

Cambridge Bay Soil and Water Treatment Facility
V.2.3
4300CBSTF

May 2026

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EXECUTIVE SUMMARY

This Plan outlines what Kitikmeot Environmental Ltd. (KEL) will do to protect the environment during operation of the soil and water treatment facility (SWTF). Before starting operations, KEL assessed baseline conditions as required, and collected samples of soil and active-layer water in the footprint of the treatment facility to measure existing conditions. Drive points sample wells will be installed to monitor active permafrost layer of meltwater during operations. While the SWTF is in operation, active-layer will be sampled once annually to ensure that no impacts are present. When it is time to close the facility, KEL will sample the soil below the liner again to confirm no impacts to soil quality have ocurred, along with final active-layer water monitoring and sampling.

REVISION HISTORY

DATE	DOCUMENT VERSION	SUMMARY OF CHANGES MADE	AUTHOR	APPROVER
June 2016	Ver. 1	Initial Draft	JF	
January 2017	Ver. 1	Initial Final Issue	JF	
December 2022	Ver.2.1	Ownership Change, Contacts & Date Updates	KHF	
May 2026	Ver.2.3	Section 1.0 operator contact info updated Section 3.1 removed reference to ASTs being on site	MG	MG

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For further information, please contact:

Kitikmeot Environmental Ltd.
regulatory@kblenv.com
780-452-7779

1.0 INTRODUCTION

Kitikmeot Environmental Ltd. (KEL), operates a soil and water treatment facility in Cambridge Bay, NU. The Facility is located adjacent to the Hamlet of Cambridge Bay sewage lagoon. KEL provides the expertise to manage the facility design, comply with the Nunavut Water Board (NWB) approval requirements, keep the facility in compliance and manage treatment operations. KEL will provide the Facility land, contracting services, and necessary equipment to treat contaminated soil and water.

Coordinates for the Facility are:

69^0 07' 40.52"N 105^0 02' 35.29"W

The site is accessible by road, from an access road off Natik Street.

Facility operations and maintenance contacts:

Corporate Office:

Kitikmeot Environmental Ltd.
30 Mitik Street
Cambridge Bay, NU
X0B 0C0

Operator Contacts:

Mike Gamache
Project Manager N60 Facilities
KBL Environmental Ltd.
mgamache@kbl.ca
403.370.2800 (cell)
Primary Contact

Jeff Flett
Operations Manager
KBL Environmental Ltd.
jflett@kbl.ca
587.646.4556
Secondary Contact

The effective date for this *Environmental Protection Plan* (the Plan) is January 1, 2023. The Plan is effective for the duration of the lease and the life of the facility, a period of five (5) years, after which it is reviewed for renewal.

2.0 ENVIRONMENTAL POLICY

Our commitment to the protection of the environment needs to be demonstrated in how we conduct our day-to-day business operations. The highest standards of care are to be taken by all employees to minimize the environmental impact of all operations. The company management team has the responsibility to take a leadership role and develop policies and procedures that minimize environmental effects. Employees have the responsibility to bring to the attention of their immediate supervisor those procedures and incidents which may impair the environment. Our policy is to:

1) Comply with all applicable government regulations.
2) Consider the environmental effects of our operations.
3) Provide staff with all the necessary information, training and equipment.
4) Develop processes, policies and procedures that minimize the occurrence and consequences of environmental incidents.

Our corporate environmental goal is to minimize the environmental impact of our operations.

3.0 PROJECT OBJECTIVES AND SCOPE OF WORK

The purpose of this Plan is to describe environmental baseline conditions and outline monitoring activities that will occur to ensure that impacts to the aquatic and terrestrial environment associated with Facility operation are avoided. The scope of this Plan includes operation and maintenance of the Facility.

KEL will manage the program operations responsibly and will comply with all licences, permits and applicable territorial and federal laws and regulations related to waste management specific to Facility operation.

3.1. Project Description

The purpose of this project is to operate, a permanent soil and water treatment facility in Cambridge Bay, NU, (CBSWTF). The site of the facility is located at 69^0 07' 40.52"N 105^0 02' 35.29"W. The permanent facility includes an engineered cell to receive petroleum hydrocarbon-contaminated snow and water. Water is treated on site by a package treatment plant. Treated water is stored in a tank until it is confirmed that the water meets discharge criteria, after which it is reused on site or released to the surrounding environment. Following bioremediation, treated soil meeting licence criteria is beneficially reused off site at the Hamlet landfill or as otherwise permitted. Soil and water not meeting discharge/reuse criteria is transported off site for disposal at a suitable facility. The facility also includes an area of the treatment pad designated for storage of hazardous wastes awaiting transportation to authorized facilities.

The permanent facility, as illustrated in Appendix A, includes one engineered cell consisting of three sub-cells: one cell 50 m x 40 m, for receipt, storage and treatment of petroleum hydrocarbon-contaminated soil; one cell designed for storage of up to 170 m^3 of petroleum hydrocarbon-contaminated snow and water; one cell 19 m x 14 m designed for storage of hazardous waste awaiting shipment; one small package treatment plant to treat petroleum hydrocarbon-contaminated water and; one small shed for storage of

supplies, documentation and health and safety equipment.

The permanent facility is intended to continue to operate for a duration of five (5) years commencing in January 2023, after which it is anticipated that the agreement with the Hamlet is reviewed.

4.0 ENVIRONMENTAL SETTING

Cambridge Bay, including the Facility, is situated within the Northern Arctic ecozone (NAE 2008). In this ecoregion, the landscape predominantly consists of low rolling plains covered with soil and rock debris left by glaciers. Many coastlines are characterized by wide flat plains with perennially frozen ground (permafrost). Mean annual temperatures range from -30 to -35°C in winter and from 5°C to 10°C in summer. Mean annual precipitation is 100-200 mm, with snow potentially falling during any month. Much of the region is devoid of plants, with the exception of some coastal lowlands and nutrient rich sheltered valleys. Muskox, Caribou, Arctic Fox and Polar Bear are the three dominant large mammals in the area, with the Collared Lemming being the only small mammal. Birds including Snowy Owl, Snow Geese, Canada Geese, and Horned Larks are also common to the region (NAE 2008).

5.0 ENVIRONMENTAL EFFECTS

5.1. Heritage Resources

The Facility has been constructed and is operating in an existing industrial area. No land clearing will occur nor will any new disturbance to the surrounding lands. The Facility is expected to have no impacts on heritage resources in the project area, as shown by results from a site data requisite sent to Government of Nunavut Department of Culture and Heritage (Appendix C).

5.2. Terrestrial Environment

The CBSWTF is operating in an existing industrial area. No land clearing will occur nor will any disturbance to the surrounding lands. Any waste generated on site is managed in accordance with the Cambridge Bay Soil and Water Treatment Facility Waste Management Plan (KEL 2026a), including appropriate containment and disposal, thus minimizing the potential to attract wildlife. Accordingly, the Facility is expected to have no impacts on vegetation or terrestrial wildlife in the vicinity of the project area.

As described in Appendix B, a baseline soil and active-layer water sampling program did occur prior to Facility operation to document existing surficial material quality. The existing and planned facility both possess an engineered liner (refer to the Cambridge Bay Treatment Facility Operations and Management Plan (KEL 2022) for a detailed description). Routine liner and facility inspections, and in the event of a tear, immediate liner repair, will occur. At the time of closure or lease transfer, soil sampling will occur to document surficial material quality and to confirm that there are no existing or ongoing impacts from the Facility on soil quality. Accordingly, impacts to soil quality in the project area are considered to be negligible.

5.3. Wind Erosion Mitigation

Strong winds can carry soil from stockpiles to areas outside the soil storage area. A contingency plan is required to mitigate soil erosion and the potential spread of contaminants. The main factors influencing wind erosion from soil stockpiles are the threshold wind speed, stockpile contents and surrounding conditions.

Wind erosion can be effectively controlled through maintaining moisture content within soil piles. Moisture is also an important factor in the bioremediation process therefore it is necessary to maintain adequate moisture content for microbial activity. Wind erosion control through moisture control is satisfied by topical applications of water from the retention pond. As required, water from the pond is sprayed over the soil stockpiles at a rate sufficient enough to minimize erosion by wind and minimal enough so as not to create ponding within the storage area.

If wind conditions are such that substantial dust is created during soil handling and treatment, activities is shut down until conditions stabilize. Where possible, operations may shift to another area within the facility that is more sheltered.

To ensure that snow in the water/snow storage pond is not susceptible to being wind swept, a snow fence is erected surrounding the pond. This will serve to decrease the effects of wind on the pond and its contents, along with serving as a barrier to people and animals.

5.4. Aquatic Environment

Effluent sampled from the CBSWTF will be submitted to an accredited lab for analysis. If the samples meet the effluent discharge criteria in the Cambridge Bay Treatment Facility Operations and Management Plan Table A4 (KEL 2026b) the effluent will be discharged to the environment, following exhaustion of effluent reuse opportunities.

If the samples do not meet the effluent discharge guidelines, the water from the storage pond will be treated with absorbent material to gather any free phase hydrocarbons that may be present. If no free phase hydrocarbons are present, chemical flocculants and/or oxidants may be added to the water to address the contaminant of concern exceeding the criteria. If treatment is successful, and once laboratory analytical results are received meeting the criteria, treated effluent is batch discharged to the ground surface through a dedicated hose wherein the water will flow overland to natural drainage. Analytical results and notification are reported to the NWB prior to the planned discharge. In the event that water does not meet discharge criteria it will undergo further treatment or be transported to a licensed off-site disposal location.

The active permafrost layer will be sampled once a year to ensure the CBSWTF is not impacting local aquatic receptors.

5.5. Air and Noise

Operation of the bioremediation pad such that remediation is efficient and effective involves maintaining

a certain degree of soil moisture during the frost-free portion of the year. Maintaining this moisture content in the soil also serves to suppress dust and avoid migration of soil off site as dust. Accordingly, impacts to air quality as well as impacts to terrestrial vegetation adjacent to the site resulting from dust deposition are considered negligible.

The Facility was constructed and operating in an existing industrial area. The main activities occurring at the site, bioremediation, are largely passive. Any activities that may generate noise such as tilling soil and pumping effluent will be periodic during summer months, of short duration, will occur during daytime hours and is lower in volume and frequency than other activities that currently occur in the industrial area. The CBSWTF is expected to have negligible impacts on ambient noise levels in the project area.

6.0 BASELINE SAMPLING PROGRAM

Baseline sampling included collection of soil samples prior to construction of the facility along with installation of shallow monitoring wells. No water was ever recovered from the well locations due to the timing and methodology of sampling. New drive-point sample devices will be installed during the height of summer of 2026 to have the highest likelihood of obtaining a water sample from the active layer of permafrost. The results of these active layer samples, both upgradient and downgradient of the treatment cell will be used to determine the current conditions at the site. Samples will also be obtained from the pond approximately 200 m south of the treatment cell and from Cambridge Bay approximately 700 m southeast of the treatment cell to determine the conditions of the potential receptor sites.

7.0 DOCUMENTATION AND REPORTING

An annual report is submitted to the Nunavut Water Board in compliance of the issued water licence. Copies of all reports is submitted GN Department of Environment (DOE), Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) and the Nunavut Water Board (NWB) in accordance with the terms and conditions of the licence approval and permits assigned to the Facility. In conjunction with annual reporting, this Plan is to be reviewed annually and updated as needed to maintain compliance. Analytical test results, as required under the anticipated water licence, is submitted to all parties. A copy of all licences and permits are maintained on site.

8.0 REFERENCES

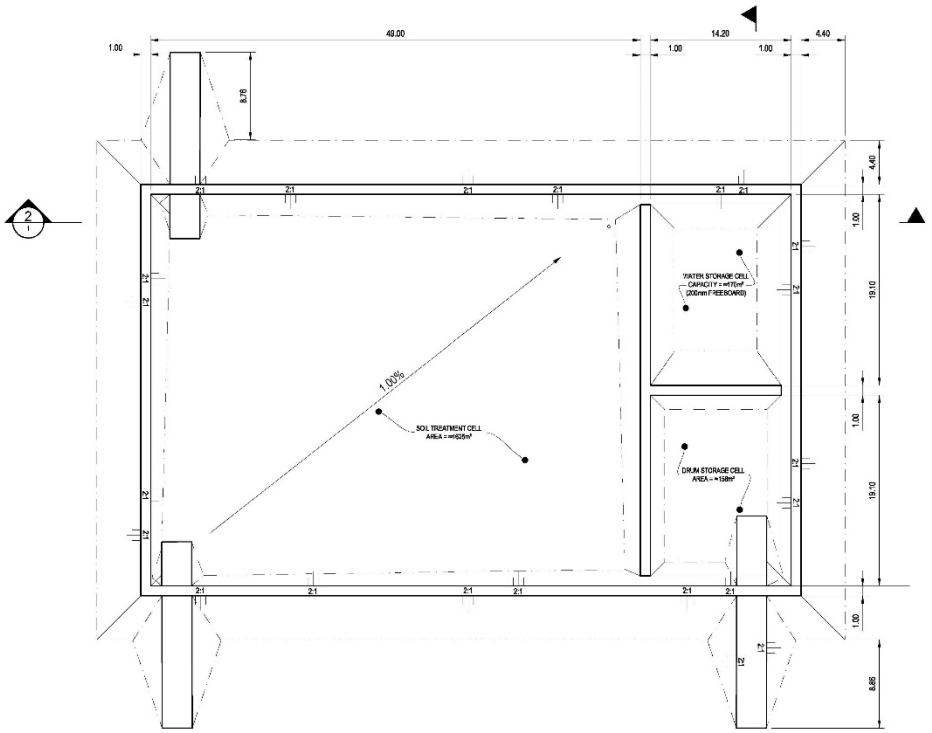
Anderson, John et al. *Northern Arctic Ecozone (NAE)* Ecological Framework of Canada (2008). April 8, 2016 <ecozones.ca>

Kitikmeot Environmental Ltd. (KEL). 2026a. Cambridge Bay Soil and Water Treatment Waste Management Plan.

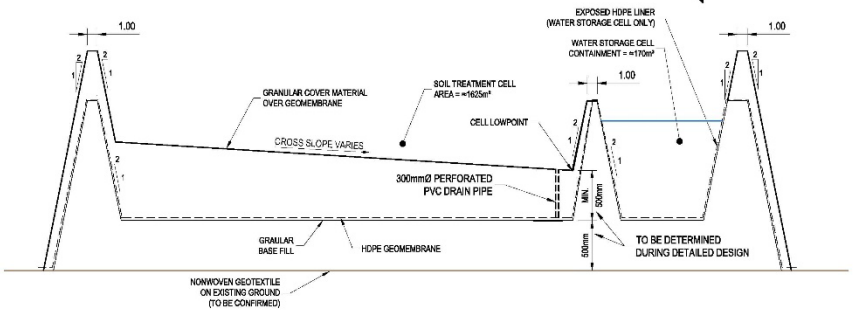
Kitikmeot Environmental Ltd. (KEL). 2026b. Cambridge Bay Soil and Water Treatment Facility Operation and Maintenance Plan.

APPENDIX A

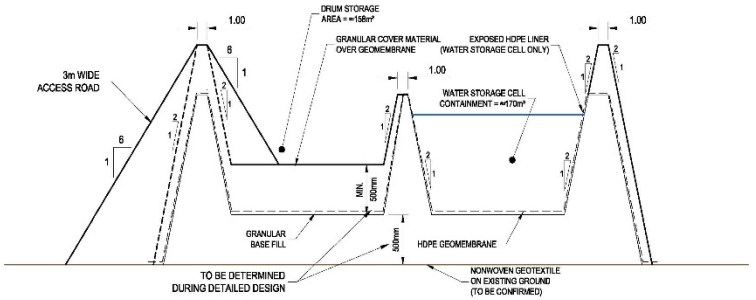
Facility Design Drawing



1 PLAN
1:250



2 SECTION
1:250H 1:25V



3 SECTION
1:250H 1:25V

NOTES:

1. FIGURE IS IN SUPPORT OF KBL'S, APPLICATION FOR A DEVELOPMENT PLAN FOR A SOIL TREATMENT FACILITY IN CAMBRIDGE BAY, NU.
2. FIGURES PRESENT GENERAL LAYOUTS AND CONCEPTUAL DESIGNS. FINAL DESIGNS AND CONSTRUCTION WILL DEPEND ON FIELD CONDITIONS AND LOCALLY AVAILABLE CONSTRUCTION MATERIALS.
3. SCALES AND DIMENSIONS ARE APPROXIMATE.
4. EXISTING GRADE IS ASSUMED TO BE FLAT AND LEVEL. ACTUAL CONFIGURATION WILL MAKE USE OF ADVANTAGEOUS NATURAL SLOPE ORIENTATIONS.
5. BERM HEIGHT MAY BE INCREASED TO ACCOMMODATE FIELD CONDITIONS.
6. GEOMEMBRANE INSTALLATION QUALITY CONTROL AND QUALITY ASSURANCE SHALL BE CONDUCTED THROUGHOUT INSTALLATION ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. BERMS AND BASE SHALL BE COMPACTED TO 98% STANDARD PROCTOR DENSITY IN LIFTS OF UP TO 300 MILLIMETRES.
8. PERMAFROST INSULATION LAYER AND GRADING FILL IS TO BE GRADED AND PROOF ROLLED WITH SMOOTH DRUM ROLLER OR SMOOTH PLATE PRIOR TO PLACEMENT OF GEOTEXTILE AND GEOMEMBRANE.
9. BERM SLOPES TO BE CONFIRMED DURING DETAILED DESIGN.
10. MINIMUM DEPTH OF BASE FILL ABOVE EXISTING GROUND TO BE CONFIRMED DURING DETAILED DESIGN.

REDUCED

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NO.	ISSUED FOR	DATE	BY
01	ISSUED FOR CLIENT REVIEW	04.13.2018	KB

DESIGN	KB
REVIEWED BY	KB
DRAWN	TPW
CHECKED BY	KB
DATE	APRIL 2018
SCALE	AS NOTED

KBL SOIL TREATMENT FACILITY - CONCEPTUAL DESIGN
CAMBRIDGE BAY, NUNAVUT

PROJECT NO. 15-2230-1000

SITE PLAN AND SECTION

SHEET NO. 1

FILENAME: C:\PROJECTFILES\WORKING_DIRECTORY\ACTIVE\L1173\R\D0182822\152230-02-SITE-CON-SITE PLAN.DWG PLOTTED BY: WOHLBERGPON, TREVOR
2017-12-14 - 8:16:24 - 8.1.1.29238 - DM NOT SCALE - 1:1 FOR 24"X36" SHEET - D:\NOW-SHEARS\CAD\CTB

APPENDIX B

Baseline Sampling Program

Baseline Soil Sample Locations	Analysis Parameters
Beneath each quadrant of Cell	BTEX F1-F4, Total Metals
Upgradient of Cell	
Downgradient of Cell	

Baseline Active Permafrost Layer Sample Locations	Analysis Parameters
CST-2, CST3, and CST-4	BTEX F1-F4, Total Metals, Total Extractable Hydrocarbons (TEH)

APPENDIX C

Department of Culture and Heritage Letter

Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

Nunavut

April 18, 2016

Joshua Foster
Kitnuna Environment Ltd.
PO Box 92, 10 Omilik Road
Cambridge Bay, Nunavut X0B 0C0

Site Data Licence: Cambridge Bay Soil and Water Treatment Facility

Dear Mr. Foster:

As requested, enclosed please find a summary of the archaeological sites within your area of investigation. Please be reminded that this data is not to be shared with anyone other than those identified in the application you submitted on April 14, 2016 and that all copies of this data must be destroyed by April 18, 2017. Written confirmation of the destruction of this data must be sent to the Government of Nunavut.

Details of Request:
Provide location of archaeological sites within the project footprint.

The Nunavut Site Data base indicates that there are no recorded sites for that location.

Sincerely,

S. deBlois
Territorial Archaeologist

P.O. Box 310
Igloolik, NU X0A 0L0

C.P. 310
Igloolik, NU X0A 0L0

Tel. (867) 934-2044
Fax: (867) 934-2047

APPENDIX D

Site Location of Soil and Water Treatment Facility



LOCATION PLAN

Source: ESRI

N

390 195 0 390

Meters

KBL

Scale:	1:24000
Date:	2020-08-07
File #:	4300
Drawn By:	DLS
Designed By:	DLS
Reviewed By:	KO

KBL Environmental LTD.

Cambridge Bay
Soil Treatment Facility



N

30 15 0 30

Meters

SITE MAP

Source: ESRI

KBL

Scale:	1:1500
Date:	2020-08-07
File #:	4300
Drawn By:	DLS
Designed By:	DLS
Reviewed By:	KO

KBL Environmental LTD.

Cambridge Bay
Soil Treatment Facility