CONSTRUCTION SUMMARY REPORT

ENVIRONMENTAL WASTE PROCESSING FACILITY

Qikqtaaluk Environmental Inc.
PO Box 2110
2027 Iqaluit Lane
Iqaluit, Nunavut X0A 0H0

November 2, 2020

O/Ref.: QE19-100-8

Qikiqtaaluk environmental
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Construction Summary Report

Environmental Waste Processing Facility

Qikqtaaluk Environmental Inc.
PO Box 2110
2027 Iqaluit Lane
Iqaluit, Nunavut X0A 0H0

Prepared and verified by:

Raquel Labranche, P.Eng.
Project Manager
NAPEG Licence: L4172

Approved by:

Jennifer Godin
Director

Qikiqtaaluk environmental
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November 2, 2020

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1. INTRODUCTION

1.1 General

The treatment facility was designed by QE's partner, Sanexen Environmental Services Inc. (Sanexen), based on their expertise. With more than 20 years' experience in the execution of biotreatment projects, as well as the combined experience of its shareholders and senior employees, Sanexen has performed on-site biotreatment projects for many clients over this period and manages and operates a permanent biotreatment facility in Quebec (Sol+). The treatment facility was adapted to the geographic situation and weather conditions in Iqaluit as well as regulatory bodies.

The Environmental Waste Processing Facility (EWPF) was developed due to a rising need for an environmental services provider in the City of Iqaluit and Nunavut in general. The EWPF is part of a business model to provide Qikiqtaaluk Environmental Inc. (QE)'s clients with a turnkey solution for the safe management of their environmental liabilities. For this Operations and Management Plan, the EWPF's activities are divided into 3 general categories, which are complementary in the proper management of waste and pollutants.

The first category includes the management of various hazardous waste streams generated by clients who require QE's services to comply with regulations regarding proper packaging, storage, transportation and final disposal of hazardous waste.

The second category of activities at the EWPF involves the treatment of **Hydrocarbon-Impacted Soils**, mainly originating from spill remediation activities that have either been carried out by QE or directly by its clients.

The third type of activity that takes place at the EWPF involves the treatment of **Hydrocarbon-Impacted Water,** which primarily originates from spill remediation operations undertaken by QE for its clients, or by the clients themselves. Some contaminated water may also be generated by snowmelt or rain coming in contact with hydrocarbon-impacted soils stored on the EWPF's HDPE-lined and bermed containment cells.

All three of these manipulation zones are on an impermeable surface that undergoes a yearly inspection by CIRNAC.

1.2 Location

The EWPF measures 19,160 m² and is located in Iqaluit, on a property leased from Nunavut Airport Services Ltd. The as-built Site plan is presented in Appendix A. The approximate coordinates of the centre of the property are:

Latitude: 63°44'38.22" N
Longitude: 68°32'58.59" W

The legal description of the EWPF is:

Lot 1673 Plan 666 REM Parcels Q & O

The civic address of the EWPF is:

2027 Iqaluit Lane
PO Box 2110
Iqaluit, Nunavut X0A 0H0

1.3 Licencing

The EWPF is currently operating under the NWB Licence No. 1BR-THI2027. A Project Licencing Summary is presented in Appendix B.

2. HAZARDOUS WASTE MANAGEMENT

Hazardous waste is collected at the EWPF, which is a voluntary drop-off site for QE's clients. The waste is received by QE personnel, inspected, identified (with client code and product ID), classified, segregated, and temporarily stored according to its physical state.

As stated in the *Environmental Guideline for the General Management of Hazardous Waste*, the EWPF meets the following requirements:

- The facility meets local and territorial siting and construction requirements and is readily accessible for firefighting and other emergency response requirements. The local Fire Chief is advised of the storage facility and its contents for emergency planning and response purposes;
- The facility is secure. Access is limited to employees who have been trained in safety and emergency procedures. These procedures are documented, and a copy is available to employees having access to the facility;
- Containers are placed so that each can readily and easily be inspected for signs of leaks, corrosion or deterioration. Leaking, corroded or deteriorated containers will be immediately removed, and their contents transferred to a sound container;
- Drainage into and from the EWPF is controlled to prevent spills or leaks from leaving the site and to prevent run-off from entering the site;
- Waste is stored on a dedicated, firm working surface, impervious to leaks;
- Incompatible waste is stored in a manner rendering impossible contact in the event of a spill or accidental release;
- An Emergency response plan (ERP) has been developed in cooperation with local emergency response personnel, and emergency response equipment is locally available in the event of a spill, fire or other emergencies. A hardcopy of the ERP is available at QE's office.

Hazardous waste is stored in sound containers approved for the type of material being stored. The containers are stored at a location on the EWPF where there is minimal traffic. The EWPF is fenced, and access is restricted to authorized personnel at all times. The entrance to the EWPF, as well as each container, bears placards indicating the presence of hazardous waste within the facility.

During the winter months, the EWPF is cleared of snow to maintain access to the storage containers.

Table 1, following, presents the Hazardous Waste Management System components and descriptions, along with their environmental controls.

TABLE 1
Hazardous Waste Management System Components

System Component	Description	Environmental Control
Registry	• Documents all hazardous waste that enters and leaves the site.	• Information is always available in the event of a spill or an incident to ensure the proper response is taken.
Work and storage zone	• All handling of hazardous waste is done in a dedicated zone.	• Liquid waste is stored in the Unconsolidated Liquid Waste Storage Area, which is part of the Multi-purpose HDPE-Lined and Bermed Containment Cell; • All other unconsolidated solid waste is temporarily stored in intermodal containers or on the ground in the Unconsolidated Solid Waste Storage Area in the same cell; • Any leaked material is recuperated by using absorbents (pads or granular) to remove as much liquid as possible and/or by manual or mechanical excavation and placed in the applicable storage area; • The bermed liner is regularly inspected by QE for signs of unusual staining, large boulders that may lead to punctures in the liner, pooling of rainwater, surface layer deterioration, etc.; • Material is packaged and identified for disposal in the south immediately in appropriate containers and shipped as soon as possible to limit the amount of time spent on-site.
*Spill kit[1]	• Always kept near the hazardous waste handling zone.	• Ensures quick and safe reaction times; • Inventory is done every year, and all materials used are replaced immediately; • A spare spill kit is always available on-site.

1 Content of a standard spill kit:

Item	Unit	Qty
Polyethelyne Drum (210 L)	Drum	1
Absorbent boom 5'' x 10'	Each	3
Absorbent Pads 15''x19'' (Pack of 100)	Pkg	1
Coverall + Boot covers	Set	2
Gloves	Pair	2
Safety Glasses	Pair	2
Clear Bags	Each	2
Epoxy	Stick	1
Oclansorb Peat Moss Absorbent	Bag	1

3. SOIL TREATMENT

QE's treatment process brings about a permanent solution to contamination issues. The treatment facility is divided into two distinct areas that include an active treatment area and a storage/processing area to improve the overall quality of soils for reuse. The soil treatment process is part of the License THI-2027.

3.1 Active Treatment Area

The active treatment area consists of 2 lined, bermed pads, each with a capacity of approximately 450 m^3 to 500 m^3 depending on the quality of soils being treated. Biopiles and landfarming techniques are used for the elimination of contaminants.

Both pads have a geotextile-geomembrane-geotextile protection underneath, with a layer of clean soil on top for protection and are presented in Figure 1 of Appendix A. The geomembrane was installed in such a way to direct rainwater towards a lower collection point. All water that has been in contact with the soil is collected in a basin before being pumped into the larger collection pond where it will be analyzed and treated.

This soil treatment facility was reviewed and approved by the NWB and NIRB as part of QE's Renewal Amendment Licence No. 1BR-THI1722.

3.2 Storage/Processing Area

In 2019, because of a growing demand for soil treatment, QE needed to expand its capacity to store and process contaminated soil.

A multi-purpose HDPE lined and bermed processing area, with a surface area of 4,500 m^2, was built to securely store hazardous waste, contaminated water and soil. It consists of a watertight cell, constructed with a 40-mil HDPE geomembrane, covered and underlain by a protective TX-400 geotextile liner and covered by a 0.3 m thick layer of clean gravel. The newly constructed area was combined with the already existing lined, bermed area that was built in 2016. The system components are presented in Figure 2 of Appendix A, and the product specifications are presented in Appendix C.

The soils to be treated arrive by truck. Upon arrival, the soils are directed to the processing area. Vehicles circulating on-site that may come into contact with contaminated surfaces are inspected and cleaned as needed.

The treatment facility is organized for optimal production, effectiveness, and simplicity. The selection of durable, long-life materials, involving greater capital costs, is a design choice that confers many operational advantages over the mid- and long-term. Such design choices translate to assets for effective and environmentally sound operations.

The System Components are presented in Figure 3 of Appendix A.

Table 2 below is a list of the soil treatment system's main components and their descriptions along with the environmental controls. Technical data sheets of various equipment and materials are presented in Appendix C.

TABLE 2
Soil Treatment System Components

System Component	Description	Environmental Control
Containment cells (treatment and processing area)	• Lined and bermed areas constructed with a watertight minimum 40 mil thick HDPE liner; • The areas are covered and underlain by a protective geotextile liner; • The areas are further protected by a 0.3 m thick layer of fine gravel; • The perimeters are surrounded by a berm several inches higher than the interior grade; • The bases have a slight slope towards the leachate/collection pond;	• Designed to isolate the contaminated soils and/or water and prevent contaminants from leaching into the environment.
Water collection ponds	• Installed at the low point of the containment cells; • Equipped with a submersible pump; • Constructed with a watertight minimum 40 mil thick HDPE liner; • Receive the leachate from the contaminated soil piles, water from the air/water separators and rainwater (200m³).	• Designed with the extra capacity necessary to store water during major precipitation events; • Designed to contain the water by cycling it back into the treatment pads or pumped directly to the WTU.
Aeration System	• Forces the air through the semipermeable liner, the soils and piping; • Contains perforated profile piping; • Contains a water/air separator before the blower equipped with a submersible pump, activated by a float with a check valve at the discharge.	• Designed to obtain the desired treatment performance by equalizing the air flowrates across the width of the biopile; • The air/water separator is positioned to prevent freezing during cold weather operations and periodically transfers the water to the collection pond to avoid any overflow into the environment.
Covering liners (optional)	• Used to cover soils undergoing treatment;	• The black colour helps to absorb heat from sunlight and maintain ideal soil temperatures; • Woven fabric allows air to penetrate and a limited quantity of precipitation into the biopiles to maintain the desired moisture content; • Acts as a vapour barrier to limit volatile contaminants.

3.3 Maintenance and Calibration

The system components, equipment, and instruments are inspected and maintained according to the manufacturer's recommendations to ensure efficiency and safety.

4. WATER TREATMENT

4.1 General

The water treatment facility was developed to be able to treat contaminants susceptible contaminants based off of QE's experience. This includes but is not limited to contaminated water and/or snow and ice resulting from spills from petroleum storage tanks, soil excavation, and through leachate from the soil treatment pads. The water treatment facility also operates under license number THI-2027.

This water is accumulated in the 440 m³ raw water collection pond then pumped to a pretreatment unit and through a multi-step filtration system. Treated water is then pumped into storage reservoirs in order to confirm the quality of water as needed before being discharged. All treatment equipment is installed on membranes ensuring any leaks are contained. See Figure 3 of Appendix A.

All material and sludge are characterized and managed according to the criteria. Their management is documented in a registry. The water samples collected as part of the water monitoring program will be analyzed for the parameters included in the licence, and all sampling will respect the procedures outlined in the QA and QC Guidelines.

Table 3 below is a list of the water treatment system's main components and their descriptions along with the environmental controls.

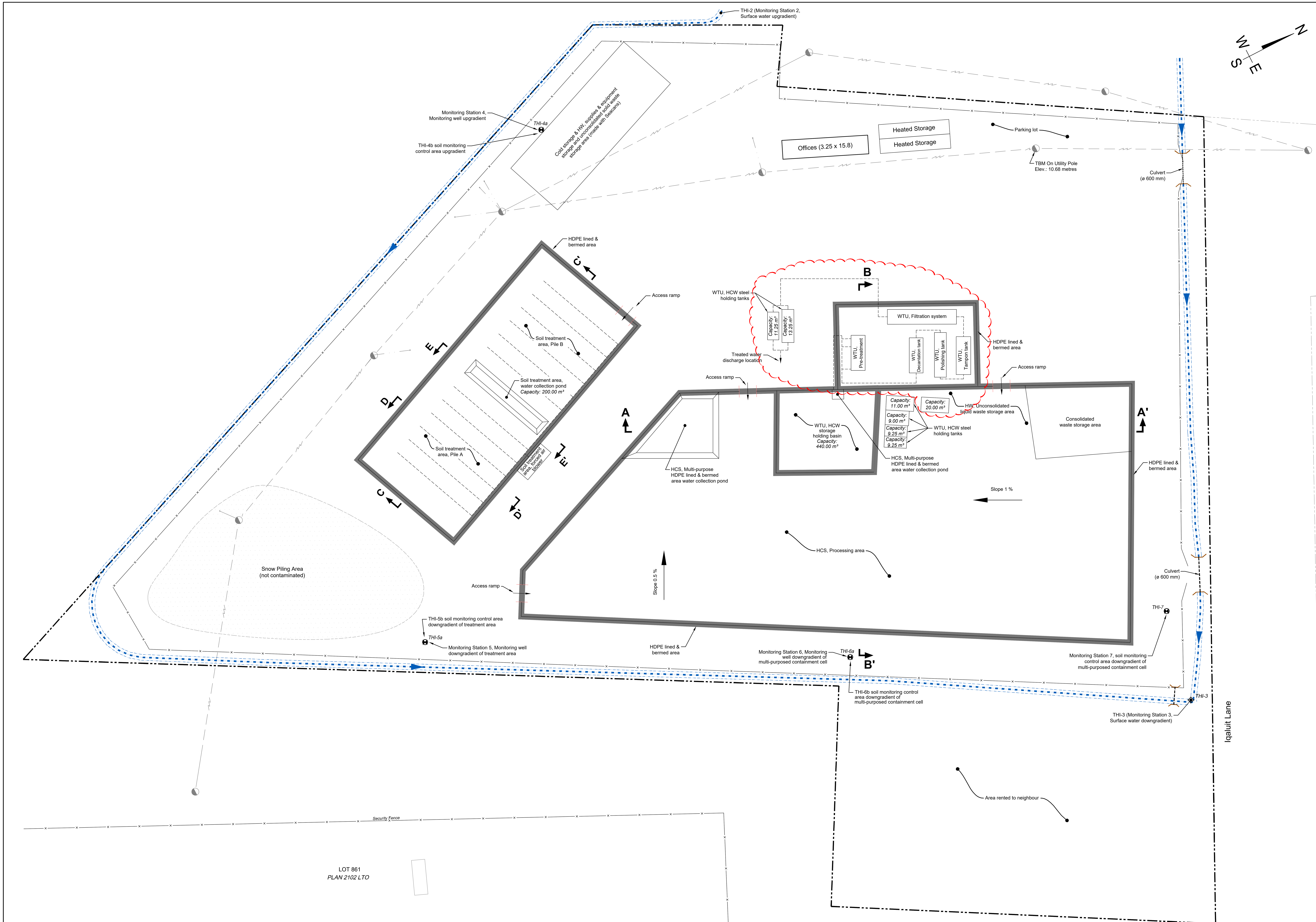
TABLE 3
Water Treatment System Components

System Component	Description	Environmental Control
Holding pond	• Collection of raw water(440m³); • Equipped with a pump.	• Located at a low point to ensure collection of all water; • Is watertight to prevent leakage.
Pretreatment system and settling unit(30L/min) (Presented in figure 4 of Appendix A)	• Consists of a dosing system for pH adjustment, coagulant, and flocculant; • Settling unit is composed of 3 different tanks	• Captures the majority of the sludge for treatment; • Is installed on the lined and bermed area to capture any hazardous liquids in the event of a spill.
Multi-step filtration system(30L/min)	• Consists of a series of filtration systems designed to treat the water: – Particles filtration (bag filter); – removal of contaminants in colloidal form (Ultrasorption^{MD} filter); – soluble contaminant removal (GAC filter). • Water Meter for the volume of water treated.	• Has a built-in secondary containment system for any leakage; • Is installed on the lined and bermed area for further protection.
Water storage tank	• Clean tank with a capacity of 44.5m³ for sampling and analysis to ensure the water complies with the criteria prior to discharge.	• Has a built-in secondary containment system for leakage; • Is installed on the lined and bermed area for further protection;

System Component	Description	Environmental Control
		• Discharge point (shown in figure 1 of Appendix A) is sampled in accordance with the *QA and QC Guidelines* pursuant to NWB Licence No. 1BR-THI2027.
Recovered waste	• Recovered Petroleum hydrocarbons and free product are containerized in closed 205 L drums for off-site shipment and disposal; • Waste filter media is packaged in waste wranglers for off-site shipment and disposal.	• Stored on-site in a secondary containment structure.

APPENDIX A

Figures



Legend

- Monitoring well (QE, 2018) (approximate location)
- Water quality monitoring point (approximate location)
- Fence (metal mesh, 1.8 m of height, 3 rows of barbwires)
- Ditch
- Overhead electrical line
- Utility pole and guy wire
- Boundary of lease (approximate location)
- HDPE lined and bermed area
- A A' Cross-section location
- Modification made since the last revision

Source:
- Kudlik Construction Ltd.; As built drawing n° QIKI ENVIRONNEMENT.dwg; November 2019;
- QE; land survey data; October 2017;
- Sub-Arctic Surveys Ltd.; File no. 15-206-QE-JL14-TOPO; July 16, 2015;
- Iqaluit - Survey Sketch 001-2015.dwg; 2015.

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CONFIDENTIAL

Seal:

INGÉNIEUR Jean-François Larose 111779 QUÉBEC

2020-11-04

Sequence:	Description:	Prepared by:	Date:	Approuved by:	Date:
D	AS-BUILT DRAWING CORRECTIONS	J.-S. B. Dicaire, jr Eng J.-F. Larose, P. Eng No OIQ: 111779	2020-10-26	J. Godin	2020-10-26
C	AS-BUILT DRAWING	J.-F. Larose, P. Eng No OIQ: 111779	2019-12-03	J. Godin	2019-12-03
B	FOR PERMIT	J.-S. B. Dicaire, jr Eng J.-F. Larose, P. Eng No OIQ: 111779	2019-09-24	O. Simard	2019-09-24
A	FOR PERMIT	J.-S. B. Dicaire, jr Eng J.-F. Larose, P. Eng No OIQ: 111779	2019-06-27	O. Simard	2019-06-27

Figure 1
Environmental Waste Processing Facility
As-built Drawing

CONSTRUCTION SUMMARY REPORT

Présented to:

Property located at:
Lease parcels O and Q, Airport lands in Iqaluit, NU

Drawn by:	Prepared by:	Approved by:
J. Bergeron	J.-F. Larose, *Eng.*	J. Godin

Date:	Revision:	Project no.:	Contract no:
2020-10-26	2	QE19-100-8	--

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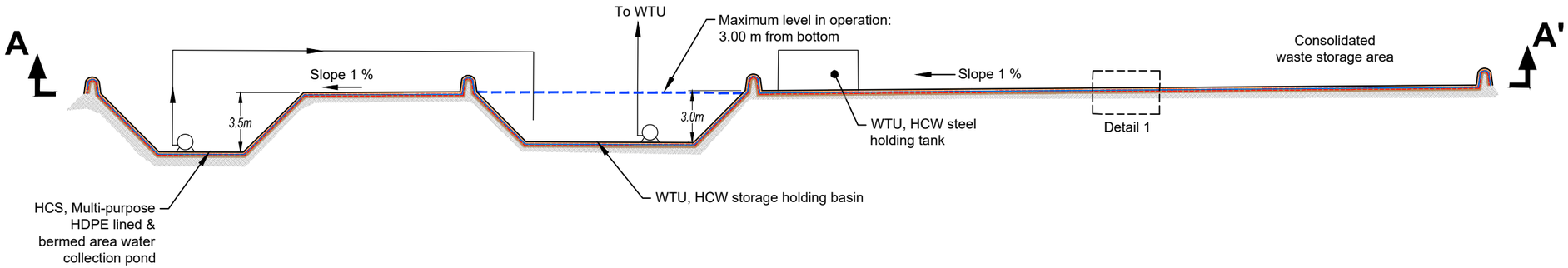
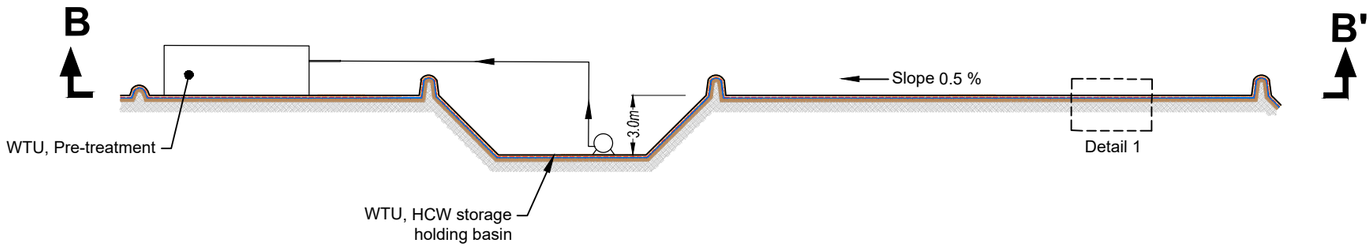
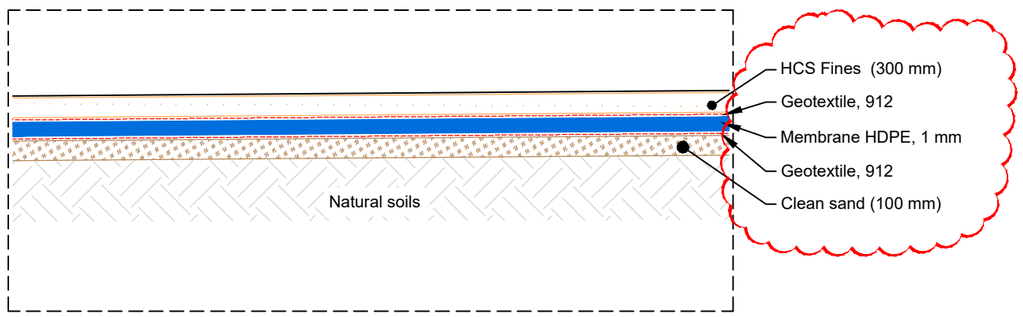
QE19-100-8-07.dwg

A-Fig 1







Detail 1
(no to scale)

This document shall not be used for construction, building or installation purposes.

NOTE:
The integration of data from various sources may result in slight discrepancies of sampling point locations. The locations of past surveys, buildings and property limits are approximate and, at times, interpreted by Sanexen.

Modification made since the last revision

Source :
- *QE; land survey data; October 2017;*
- *Sub-Arctic Surveys Ltd.; File no. 15-206-QE-JL14-TOPO; July 16, 2015;*
- *Iqaluit - Survey Sketch 001-2015.dwg; 2015.*

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Seal:

INGÉNIEUR Jean-François Larose 111779 QUÉBEC

2020-11-04

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D	*AS-BUILT DRAWING CORRECTIONS*	
Prepared by: J.-S. B. Dicaire, *jr Eng*; J.-F. Larose, *P. Eng* No OIQ: 111779		2020-10-19
Approved by: J. Godin		2020-10-19
B	*AS BUILT DRAWING*	
Prepared by: J.-F. Larose, *P. Eng* No OIQ : 111779		2019-12-03
Approved by: J. Godin		2019-12-03
A	*FOR PERMIT*	
Prepared by: J.-S. B. Dicaire, *jr Eng*; J.-F. Larose, *P. Eng* No OIQ : 111779		2019-06-27
Approved by: O. Simard		2019-06-27

Figure 2
Environmental Waste Processing Facility Sections

CONSTRUCTION SUMMARY REPORT

Présenté to:

Property located at:
Lease parcels O and Q,
Airport lands in Iqaluit, NU

Drawn by:	Prepared by:	Approved by:
J. Bergeron	J.-S. B. Dicaire, *jr.Eng./* J.-F. Larose, *P. Eng.*	J. Godin

Date:	Revision:	Project no.:	Contract no:
2020-10-20	2	QE19-100-8	

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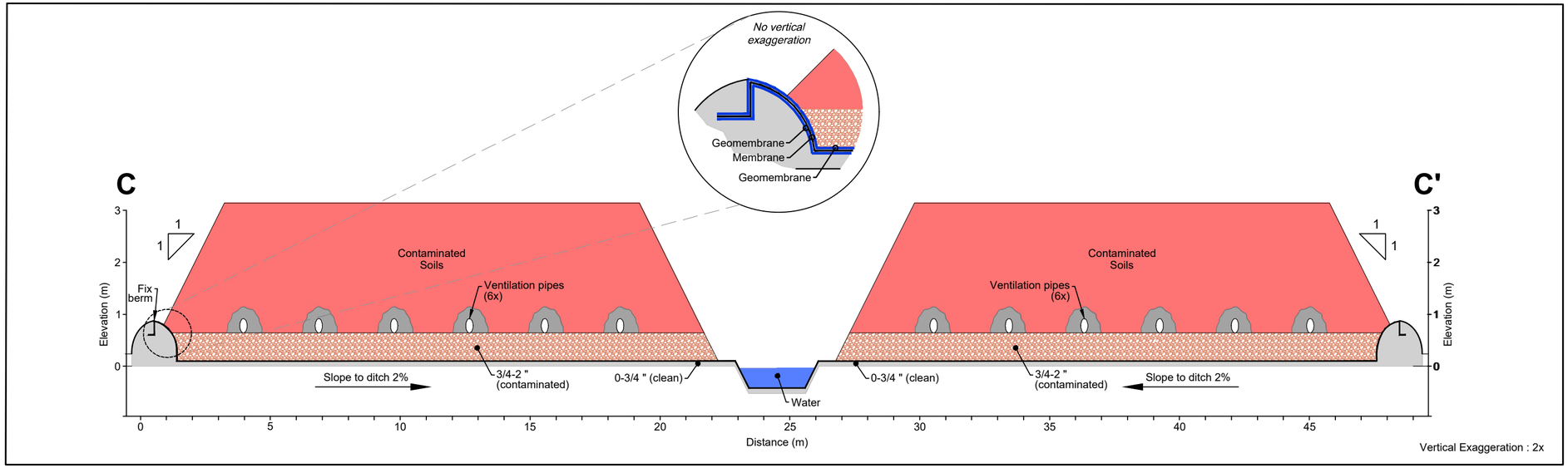
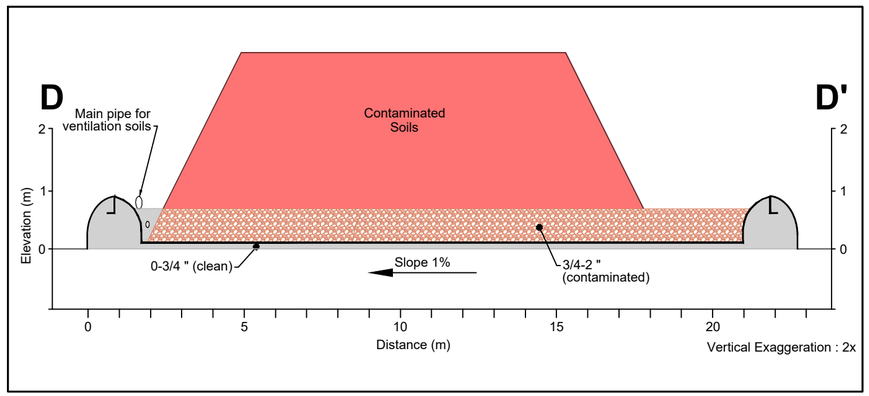
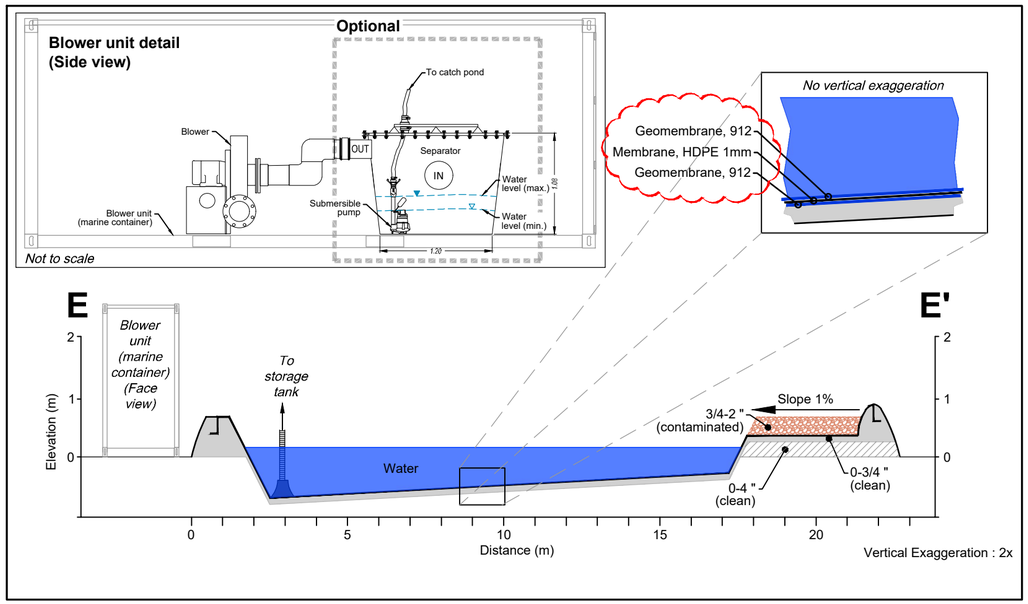
QE19-100-8-07.dwg

B-Sections







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NOTE:
The integration of data from various sources may result in slight discrepancies of sampling point locations. The locations of past surveys, buildings and property limits are approximate and, at times, interpreted by Sanexen.

Modification made since the last revision

Source :
- *QE; land survey data; October 2017;*
- *Sub-Arctic Surveys Ltd.; File no. 15-206-QE-JL14-TOPO; July 16, 2015;*
- *Iqaluit - Survey Sketch 001-2015.dwg; 2015.*

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2020-11-04

Sequence:	Description:	
D	*AS-BUILT DRAWING CORRECTIONS*	
Prepared by: J.-F. Larose, *P. Eng* No OIQ: 111779		Date: 2020-10-19
Approved by: J. Godin		Date: 2020-10-19
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B	*AS BUILT DRAWING*	
Prepared by: J.-F. Larose, *P. Eng* No OIQ : 111779		Date: 2019-12-03
Approved by: J. Godin		Date: 2019-12-03
Sequence:	Description:	
A	*FOR PERMIT*	
Prepared by: J.-S. B. Dicaire, *jr Eng* J.-F. Larose, *P. Eng* No OIQ : 111779		Date: 2019-06-27
Approved by: O. Simard		Date: 2019-06-27

Figure 3
Environmental Waste Processing Facility Sections

CONSTRUCTION SUMMARY REPORT

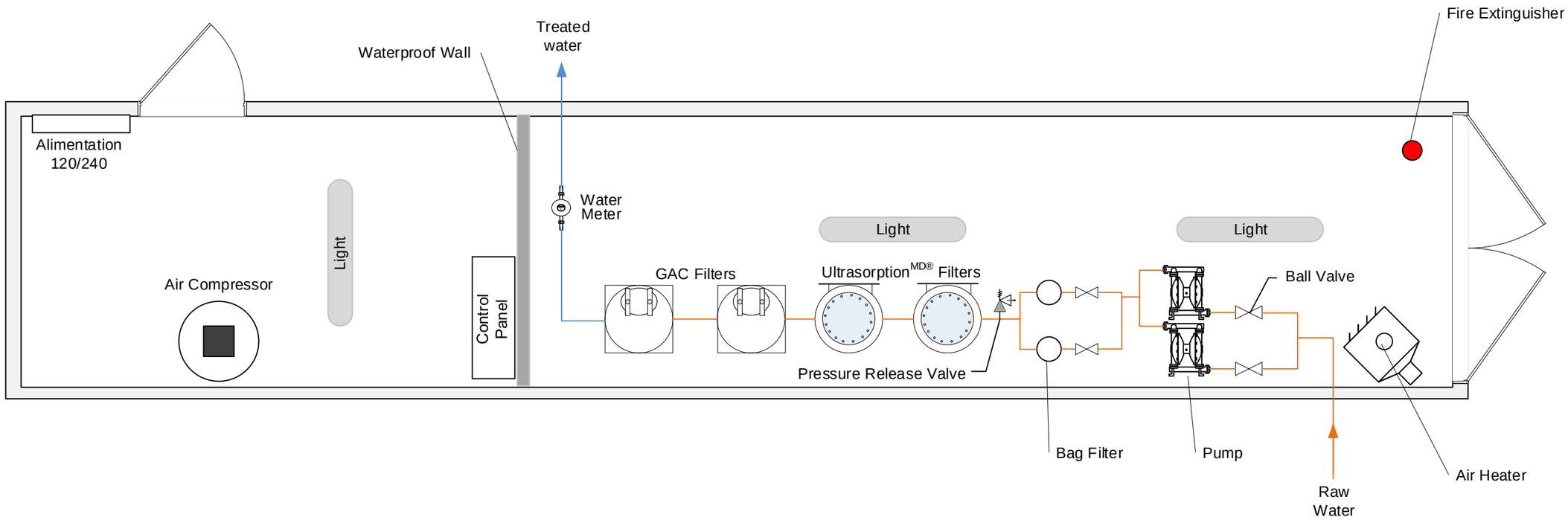
Présenté to:

Property located at:
Lease parcels O and Q,
Airport lands in Iqaluit, NU

Drawn by:	Prepared by:	Approved by:
J. Bergeron	J.-S. B. Dicaire, *jr.Eng.*/ J.-F. Larose, *P. Eng.*	J. Godin
Date: 2020-10-20 / Revision: 2	Project no.: QE19-100-8	Contract no:

Qikiqtaaluk environmental

QE19-100-8-07.dwg
C-Sections



Stamp:

INGÉNIEUR Jean-François Larose 111779 QUÉBEC

2020-11-04

Sequence:	Description:	
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Prepared by: J.-S. B. Dicaire, *Jr.Eng.*/ J.-F. Larose, *P.Eng.* No OIQ: 111779		Date: 2020-10-28
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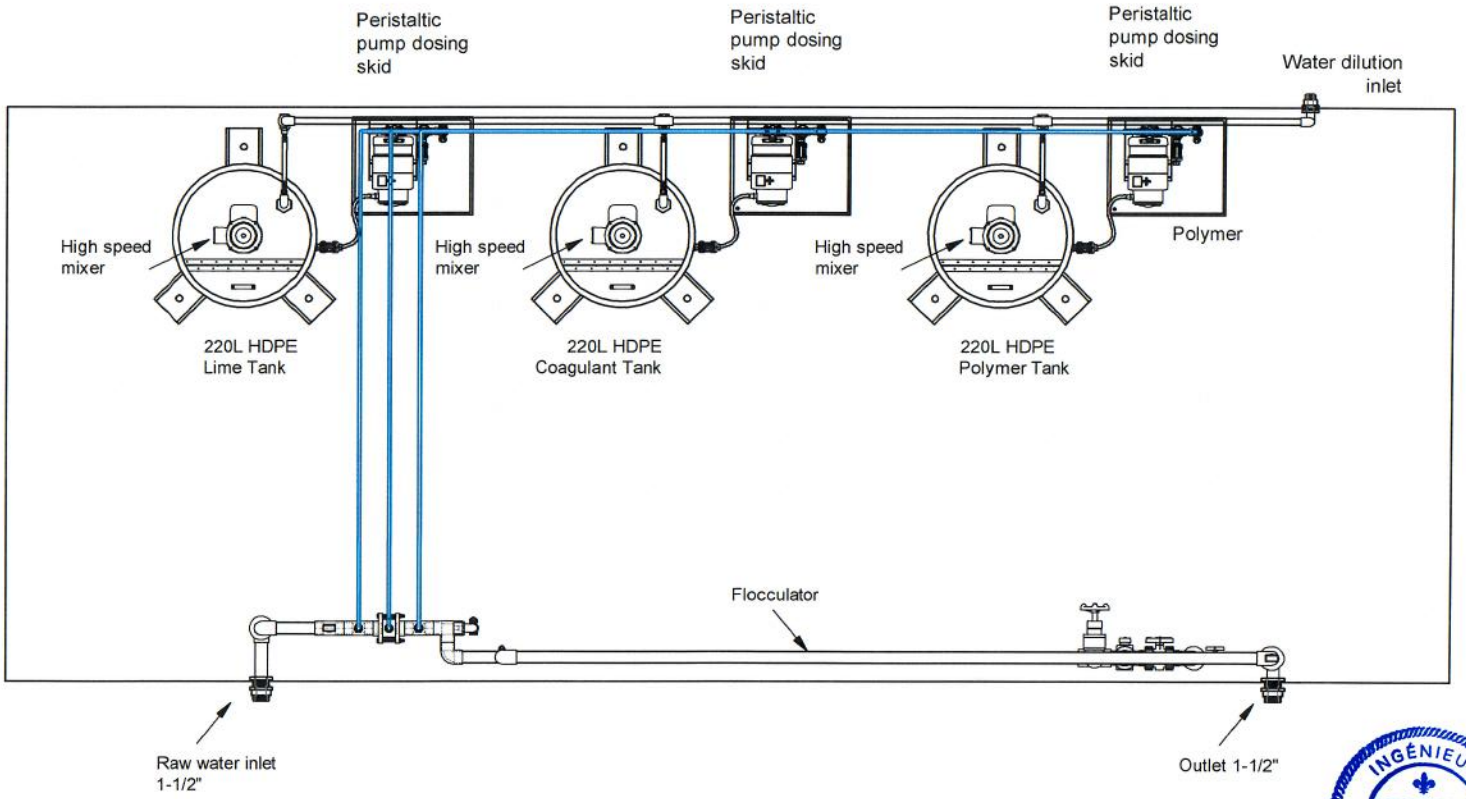
A	FOR PERMIT	
Prepared by: J.-S. B. Dicaire, *Jr.Eng.*/ J.-F. Larose, *P.Eng.* No OIQ: 111779		Date: 2019-06-27
Approved by: O. Simard		Date: 2019-06-27

CONFIDENTIAL

Title: Figure 4 **FILTRATION UNIT LAYOUT**	Drawn by: J.-S. B. Dicaire, *Jr.Eng.*	Veryfied by: J.-F. Larose, *P.Eng.*	Approved by: J. Godin	Presented to: NIRB
Project: **CONSTRUCTION SUMMARY REPORT** *Lease parcels O and Q, Airport lands in Iqaluit, NU*	Date: 2020-10-28	Project nº. QE19-100-8-02.vsdx	Revision: 1	Presented by: SANEXEN ENVIRONMENTAL SERVICES INC.



INGÉNIEUR
Eric Pelletier
121283
QUÉBEC

POLYCHEM	DESSINE PAR: ERIC_PELLETIER,ING.	TITRE: TRAITEMENT_DES_EAUX_USÉES	REV:	DATE:	MODIF.:	APP.:	DATE: 2020/10/21
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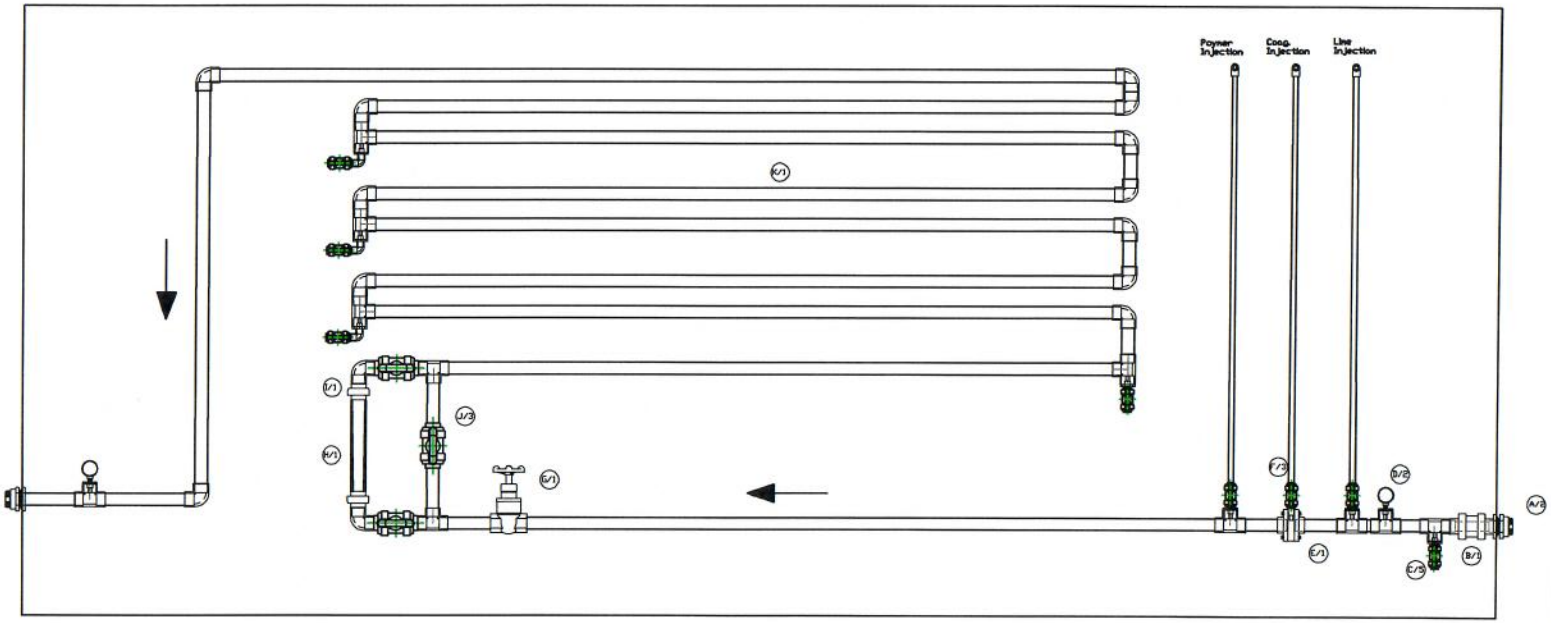
			REV3	DATE3	MODIF.3	APP.3	

FLOCCULATOR DETAILS



DETAILS:
A/2: 1-1/2" PVC/EPDM Bulkhead fitting
B/1: 1-1/2" PVC/EPDM Check valve
C/5: ½" PVC/EPDM Drain valve
D/2: 2.5" SS316 Glycerin filled pressure gauge (0-60 PSI)
E/1: Static Mixer Westfall 1-1/2" PVC
F/3: Isolation ball valves ½" PVC/EPDM
G/1: 1-1/2" PVC Globe valve
H/1: PVC / Acrylic Rotameter 1" FNPT, 1-10 GPM
I/2: Union
J/3: 1-1/2" PVC/EPDM Ball valve
K/1: 1-1/2" Sch 80 grey pipe

INGÉNIEUR
Eric Pelletier
121203
QUÉBEC

POLYCHEM	DESSINE PAR: ERIC_PELLETIER,ING.	TITRE:	CONTENEUR	REV:	DATE:	MODIF.:	APP.:	DATE: 2019/04/06
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				REV3	DATE3	MODIF.3	APP.3	

APPENDIX B

Project Licencing History

NUNAVUT WATER BOARD
AMENDED RENEWAL WATER LICENCE

Licence No. 1BR-THI2027

Pursuant to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

QIKIQTAALUK ENVIRONMENTAL INC.

(Licensee)

PO BOX 2110 / 2027 IQALUIT LANE, IQALUIT, NU X0A 0H0,

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use Water or dispose of Waste for a period subject to restrictions and conditions contained within this Licence Renewal:

Licence Number/Type:	**1BR-THI2027 / TYPE "B"**
Water Management Area:	**FROBISHER BAY WATERSHED (53)**
Location:	**CITY OF IQALUIT / QIKIQTANI REGION, NUNAVUT**
Classification:	**INDUSTRIAL UNDERTAKING**
Purpose:	**DEPOSIT OF WASTE**
Quantity of Water use not to Exceed:	**USE OF WATER IS NOT AUTHORIZED**
Effective Date :	**JANUARY 1, 2020**
Expiry of Licence:	**DECEMBER 31, 2027**

This Licence amendment and renewal, issued and recorded at Gjoa Haven, Nunavut, includes and is subject to the annexed conditions.

Lootie Toomasie,
Nunavut Water Board, Chair

APPENDIX C

Technical Data Sheets

DATA SHEET

TX-400

PRODUCT DESCRIPTION: Nonwoven needled geotextile

FUNCTIONS: Separation, reinforcement and protection

RAW MATERIAL: Polypropylene / polyester

TECHNICAL DATA TABLE

	PROPERTIES	TEST METHOD	VALUES	
			Metric	Imperial
PHYSICAL	Thickness	ASTM D5199	2.8 mm	112 mils
	Mass per unit area	ASTM D5261	-	-
MECHANICAL	Tensile strength	CAN/CGSB-148.1 - No 7.3	1200 N	270 lb
	Elongation at break	CAN/CGSB-148.1 - No 7.3	50 – 110 %	
	Tear strength	CAN/CGSB-4.2 - No 12.2	530 N	119 lb
	Puncture strength (CBR)	ASTM D6241	3350 N	753 lb
HYDRAULIC	Permeability	CAN/CGSB-148.1 - No 4	0.19 cm/s	
	Permittivity	CAN/CGSB-148.1 - No 4	0.80 s^{-1}	
	Filtration opening size (FOS)	CAN/CGSB-148.1 - No 10	50 - 90 µm	
PERFORMANCE AND DURABILITY	UV resistance (500 hours)	ASTM D4355	50 %	
DIMENSIONS	Standard width	-	3.5 m	11.5 ft
	Standard length	-	100.0 m	328.0 ft

The enclosed information is provided at no cost or obligation on the part of Soleno Textiles Inc. The individual using this information in their possession assumes full responsibility for its use, including that of ensuring that this technical data sheet is the latest update by contacting Soleno Textiles Inc. Values are calculated using the minimum average roll value (MARV), as defined by ASTM D-4439. Roll sizes can vary 0.5 % from standard sizes.

Soleno Textiles Inc. offers no guarantee regarding the use, installation or suitability of the geotextiles described in this document. Since conditions surrounding the use and handling of our products can vary and are beyond the control of Soleno Textiles Inc., it can in no way be held responsible for the product's performance and the consequences of improper installation or use. Soleno Textiles Inc. must be advised of any defect or non-compliance of its product before installation. Soleno Textiles Inc.'s liability will be limited to the replacement of the deficient or defective product to the exclusion of any legal or contractual warranty.

APPLICATIONS: Railway tracks
Basins
Retaining walls and embankments
Bank protection
Dams and dikes

FICHE TECHNIQUE

TX-400

DESCRIPTION DU PRODUIT : Géotextile non tissé aiguilleté

FONCTIONS : Séparation, renforcement et protection

MATIÈRE PREMIÈRE : Polypropylène / polyester

TABLEAU DES DONNÉES TECHNIQUES

	PROPRIÉTÉS	MÉTHODE D'ESSAI	VALEURS	
			Métrique	Impérial
PHYSIQUES	Épaisseur	ASTM D5199	2,8 mm	112 mils
	Masse surfacique	ASTM D5261	-	-
MÉCANIQUES	Résistance à la traction	CAN/CGSB-148.1 - No 7.3	1200 N	270 lb
	Allongement à la rupture	CAN/CGSB-148.1 - No 7.3	50 - 110 %	
	Résistance à la déchirure	CAN/CGSB-4.2 - No 12.2	530 N	119 lb
	Poinçonnement (CBR)	ASTM D6241	3350 N	753 lb
HYDRAULIQUES	Perméabilité	CAN/CGSB-148.1 - No 4	0,19 cm/s	
	Permittivité	CAN/CGSB-148.1 - No 4	0,80 s^{-1}	
	Ouvertures de filtration (FOS)	CAN/CGSB-148.1 - No 10	50 - 90 µm	
PERFORMANCE ET DURABILITÉ	Résistance aux UV (500 h)	ASTM D4355	50 %	
DIMENSIONS	Largeur standard	-	3,5 m	11,5 pi
	Longueur standard	-	100,0 m	328,0 pi

L'information ci-incluse est fournie sans frais ni obligation de la part de Soleno Textiles inc. La personne ayant cette information en sa possession assume toute la responsabilité pour son utilisation, incluant celle de s'assurer que cette fiche technique représente la dernière mise à jour en communiquant avec Soleno Textiles inc. Les valeurs sont calculées à l'aide du MARV tel que défini par ASTM D-4439. Les dimensions des rouleaux peuvent varier de 0,5 % des grandeurs standards.

Soleno Textiles inc. n'offre aucune garantie relativement à l'usage, à l'installation ou à la convenance d'utilisation des géotextiles décrits dans ce document. Comme les conditions d'usage et de manutention de nos produits peuvent varier et sont hors du contrôle de Soleno Textiles inc., cette dernière ne peut en aucune façon être tenue responsable de la performance des produits et des conséquences d'installations ou d'usages inadéquats. Soleno Textiles inc. doit être informée de tout défaut ou non-conformité de produit avant son installation. La responsabilité de Soleno Textiles inc. se limitera au remplacement du produit non conforme ou défectueux, à l'exception de toute garantie légale ou contractuelle.

APPLICATIONS : Voie ferrée
Bassin
Mur de soutènement, remblais et talus
Protection de berge
Barrage et digue

912

FICHE TECHNIQUE

Type de produit	Géotextile non-tissé aiguilleté
Composition	Polypropylène / Polyester
Fonction principale	Protection

Propriété	Méthode de test	912
Physique		
Épaisseur	ASTM D5199	2.5 mm
Masse surfacique	ASTM D5261	250 g/m²
Mécanique		
Résistance en tension	ASTM D4632	1000 N
Allongement à la rupture	ASTM D4632	50%
Résistance en déchirure	ASTM D4533	385 N
Poinçonnement CBR	ASTM D6241	3300 N
Résistance UV (500 heures)	ASTM D4355	50%
Hydraulique		
Permittivité	ASTM D4491	0.90 s^{-1}
FOS	CAN 148.1 No.10	45-150 µm
Dimensions		
Largeur	-	3.81 / 4.57 / 5.25 m (1)
Longueur	-	100 m

Données supplémentaires pour la certification BNQ7009-210 selon le grade normalisé P2 :

Propriété et méthode de test	CVMS(2)	912
Résistance en tension ASTM D4632	< 5%	1000 N
	5-10%	1050 N
	10-15%	1100 N

Les propriétés sont basées sur la valeur minimum moyenne de rouleau (MARV) sauf lorsque spécifié autrement.
Notre système de gestion de la qualité est certifié par la norme ISO-9001.
Notre laboratoire interne est certifié par la Geosynthetic Accreditation Institute - Laboratory Accreditation Programm (GAI-LAP).
Les valeurs inscrites sont des valeurs obtenues au moment de la fabrication. La manutention et les conditions d'entreposage peuvent changer certaines propriétés.

À noter, cette fiche technique est mise à jour en tenant compte du transfert des méthodes de test en norme ASTM (American Society for Testing and Materials) au lieu des normes ONGC (Office des Normes Générales du Canada). Sauf pour la méthode de test du FOS (CAN 148.1 No.10), les méthodes de tests ASTM sont maintenant utilisées, car l'ONGC n'offre plus de mise à jour pour ces normes.

1- La largeur de 3.5m ne sera plus disponible pour toute nouvelle production en 2020. Vérifier les largeurs standard disponibles. Service de coupe et de couture disponibles.
2- Coefficient de variation de masse surfacique

Révision : 2020-03-23

SPÉCIFICATIONS TECHNIQUES

HDPE Series, 1.00 mm

Noir, Lisse

2801 Boul. Marie-Victorin Varennes, Quebec Canada J3X 1P7
Tel: (450) 929-1234 Sales: (450) 929-2544 Toll free in North America:1-800-571-3904 www.Solmax.com www.solmax.com

PROPRIÉTÉ	MÉTHODE	FRÉQUENCE(1)	UNITÉ Métrique	
SPÉCIFICATION				
Épaisseur (moy. min.)	ASTM D5199	Chaque rouleau	mm	1.00
Épaisseur (min.)	ASTM D5199	Chaque rouleau	mm	0.90
Indice de fluidité - 190/2.16 (max.)	ASTM D1238	1/Lot	g/10 min	1.0
Densité - Géomembrane (8)	ASTM D792	1/10 rouleaux	g/cc	≥ 0.940
Teneur en noir de carbone	ASTM D4218	1/2 rouleaux	%	2.0 - 3.0
Dispersion en noir de carbone	ASTM D5596	1/10 rouleaux	Catégories	Cat. 1 / Cat. 2
Rés. à l'oxydation - STD OIT (moy. min.)	ASTM D3895	1/Lot	min	100
Propriétés de traction (moy. min.) (2)	ASTM D6693	1/2 rouleaux		
Limite élastique			kN/m	15
Allongement à la limite élastique			%	13
Rés. à la rupture			kN/m	28
Allongement à la rupture			%	700
Rés. à la déchirure (moy. min.)	ASTM D1004	1/5 rouleaux	N	125
Rés. au poinçonnement (moy. min.)	ASTM D4833	1/5 rouleaux	N	356
Stabilité dimensionnelle	ASTM D1204	Certifié	%	± 2
Rés. aux contraintes environnementales	ASTM D5397	1/Lot	hr	500
Vieillissement au four - % retenu après 90 jrs	ASTM D5721	1/Formulation		
HP OIT (moy. min.)	ASTM D5885		%	80
Rés. Aux UV - % retenu après 1600 hr	ASTM D7238	1/Formulation		
HP-OIT (moy. Min.)	ASTM D5885		%	50
Resistance au pliage à froid	ASTM D746	Certifié	°C	- 77
SPÉCIFICATION DES ROULEAUX (Les dimensions des rouleaux peuvent varier de ±1%)				

NOTES

1. La fréquence des tests est basée sur la dimension standard des rouleaux ou sur un lot de résine qui est approximativement 180,000 lbs (1 wagon).
2. La valeur moyenne est basée sur 5 échantillons dans les deux directions (Sens Machine (MD) et Sens Travers (XMD ou TD).
8. Table de corrélation disponible pour ASTM D792 vs ASTM D1505. Les deux méthodes donnent le même résultat
11. Condition d'essai:20 hr. Cycle UV à 75°C suivi de 4 hr. condensation à 60°C.

* Toutes les valeurs sont des moyennes minimales, hors les valeurs spécifiées minimum ou maximum.
* L'information ci-dessus est fournie à titre d'information seulement et ne doit pas être interprétée comme une garantie. L'utilisateur est responsable quant à la détermination finale reliée à l'usage/application de la géomembrane. SOLMAX n'assume aucune responsabilité quant à l'utilisation de cette information.

Solmax n’est pas un professionnel de conception et n’a rendu aucun service de conception pour déterminer si les biens fournis par Solmax sont conformes à tous plans ou spécifications du projet ou encore, avec l’application ou l’utilisation des biens de Solmax pour toute forme de système, de projet, d’intention, d’installation ou de spécifications donnés.

TECHNICAL DATA SHEET

HDPE Series, 1.00 mm

Black, Smooth

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Tel: (450) 929-1234 Sales: (450) 929-2544 Toll free in North America:1-800-571-3904 www.Solmax.com www.solmax.com

PROPERTY	TEST METHOD	FREQUENCY[1]	UNIT Metric	
SPECIFICATIONS				
Thickness (min. avg.)	ASTM D5199	Every roll	mm	1.00
Thickness (min.)	ASTM D5199	Every roll	mm	0.90
Melt Index - 190/2.16 (max.)	ASTM D1238	1/Batch	g/10 min	1.0
Sheet Density (8)	ASTM D792	Every 10 rolls	g/cc	≥ 0.940
Carbon Black Content	ASTM D4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D5596	Every 10 rolls	Category	Cat. 1 / Cat. 2
OIT - standard (avg.)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg) (2)	ASTM D6693	Every 2 rolls		
Strength at Yield			kN/m	15
Elongation at Yield			%	13
Strength at Break			kN/m	28
Elongation at Break			%	700
Tear Resistance (min. avg.)	ASTM D1004	Every 5 rolls	N	125
Puncture Resistance (min. avg.)	ASTM D4833	Every 5 rolls	N	356
Dimensional Stability	ASTM D1204	Certified	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D5397	1/Batch	hr	500
Oven Aging - % retained after 90 days	ASTM D5721	Per formulation		
HP OIT (min. avg.)	ASTM D5885		%	80
UV Res. - % retained after 1600 hr	ASTM D7238	Per formulation		
HP-OIT (min. avg.)	ASTM D5885		%	50
Low Temperature Brittleness	ASTM D746	Certified	°C	- 77
SUPPLY SPECIFICATIONS (Roll dimensions may vary ±1%)				

NOTES

1. Testing frequency based on standard roll dimension and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.
8. Correlation table is available for ASTM D792 vs ASTM D1505. Both methods give the same results.

* All values are nominal test results, except when specified as minimum or maximum.
* The information contained herein is provided for reference purposes only and is not intended as a warranty of guarantee. Final determination of suitability for use contemplated is the sole responsability of the user. SOLMAX assumes no liability in connection with the use of this information.

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