27. The Licensee must provide a final decommissioning plan consistent with *Carcross Waste Treatment Facility, Conceptual Decommissioning Plan* for review and comment within a minimum of 2 years prior to decommissioning.

28. Subject to any required assessments, authorizations or approvals, the Licensee must implement all plans required by this section of this Licence.

PART E – EFFLUENT QUALITY STANDARDS

29. All wastewater discharged from the facility to the SRI area must meet the following effluent quality standards (EQS) at CC-4d, as described in Schedule A of this Licence:

PARAMETER		MAXIMUM CONCENTRATION IN A GRAB SAMPLE
BOD_5		100 mg/L
Total Suspended Soilds (TSS)		100 mg/L[1]
pH		6 - 11
Volatile Organic Compounds (VOCs)	Benzene	4,000 µg/L
	Ethylbenzene	2,000 µg/L
	Styrene	720 µg/L
	Toluene	390 µg/L
Polycyclic Aromatic Hydrocarbons (PAHs)	Acridine	0.5 µg/L
	Anthracene	1.0 µg/L
	Benz[a]anthracene	1.0 µg/L
	Benzo[a]pyrene	0.1 µg/L
	Fluoranthene	2 µg/L
	Fluorene	120 µg/L
	Napththalene	10 µg/L
	Phenanthrene	3 µg/L
	Pyrene	0.2 µg/L
	Quinoline	34 µg/L
Aggregate Hydrocarbons	Volatile Petroleum Hydrocarbons in water, VPHw	1.5 mg/L

Aggregate Hydrocarbons	Light Extractable Petroleum Hydrocarbons in Water, LEPHw	0.5 mg/L
Fecal Coliforms		20,000 counts/ 100 mL
Ammonia-N		30 mg/L
Un-Ionized Ammonia		1.25 mg/L[2]

1 If TSS result >100 mg/L between July 15 and September 30, the result is not considered an exceedance of the EQS.

2 The concentration of un-ionized ammonia in effluent must be determined in accordance with the following formula:

$$\textbf{Total Ammonia} \times 1 \div (1 + 10^{9.56-pH})$$

Where:

Total Ammonia is the concentration of total ammonia – namely, un-ionized ammonia (NH_3) plus ionized ammonia (NH_{4+}) – expressed in mg/L as nitrogen (N); and
pH is the pH of the effluent adjusted to 15°C ±1°C.

30. Prior to discharge from storage cell 1; the Licensee must sample SCp-1 and prior to discharge from storage cell 2; the Licensee must sample SCp-2. Sample results must indicate that EQSs in clause 29 can be achieved in treated effluent that is discharged.

31. If the analysis of a water quality sample collected at CC-4d indicates an exceedance of the EQSs in clause 29, the Licensee must notify the Inspector and the Board in writing, within 24 hours of detecting the exceedance.

32. If petroleum hydrocarbons are detected in exceedance of the EQSs in the anaerobic/primary cell, additional sampling is required as described in the Operation and Maintenance Manual.

33. Groundwater must meet the following water quality standards at monitoring stations CC-5, CC-6, CC-7, NW-2, NW-3 and NW-4:

PARAMETER		**MAXIMUM CONCENTRATION FOR ANY SAMPLE**
BOD_5		10 mg/L
pH		6 - 9
Volatile Organic Compounds (VOCs)	Benzene	4,000 µg/L
	Ethylbenzene	2,000 µg/L
	Styrene	720 µg/L
	Toluene	390 µg/L

Polycyclic Aromatic Hydrocarbons (PAHs)	Acridine	0.5 µg/L
	Anthracene	1.0 µg/L
	Benz[a]anthracene	1.0 µg/L
	Benzo[a]pyrene	0.1 µg/L
	Fluoranthene	2 µg/L
	Fluorene	120 µg/L
	Napththalene	10 µg/L
	Phenanthrene	3 µg/L
	Pyrene	0.2 µg/L
	Quinoline	34 µg/L
Aggregate Hydrocarbons	Volatile Petroleum Hydrocarbons in water, VPHw	1.5 mg/L
	Light Extractable Petroleum Hydrocarbons in Water, LEPHw	0.5 mg/L
Fecal Coliforms		0
Ammonia-N		3.7 mg/L
Un-Ionized Ammonia		0.19 mg/L[1]

1 The concentration of un-ionized ammonia in the sample must be determined in accordance with the following formula:

$$\textbf{Total Ammonia} \times 1 \div (1 + 10^{9.56-\text{pH}})$$

Where:

Total Ammonia is the concentration of total ammonia – namely, un-ionized ammonia (NH_3) plus ionized ammonia (NH_{4+}) – expressed in mg/L as nitrogen (N); and
pH is the pH of the sample adjusted to 15°C ±1°C.

PART F – MONITORING AND SURVEILLANCE

34. The Licensee must comply with the monitoring and surveillance requirements specified in Schedule A of this Licence.

35. All data collection and analyses must be conducted in accordance with the most recent edition of *Standard Methods for the Examination of Water and Wastewater*, prepared and published jointly by the American Water Works Association and the Water Pollution Control Federation.

36. The Licensee must compile data relating to the surveillance network program into the annual report.

Soil Salinity Survey

37. The Licensee must conduct a survey of soil salinity (sodium) and vegetation success within the SRI area no less frequently than once every 5 years. A report on the survey must be included in the annual report for that year.

Physical Inspections and Monitoring

38. An annual inspection of the wastewater treatment facility and the sludge drying beds must be carried out by a Professional Engineer licensed to practice in Yukon. A report on the inspection, prepared by the Professional Engineer, must be submitted as part of the annual report. The report must document the inspection locations and methodologies, the results of the inspection, all problems identified, and remedial measures recommended. The status of any remedial measures recommended in the report for the previous year must be appended to the report together with an explanation regarding any recommendation not implemented.

39. Details of any maintenance, inspection and/or surveillance activities undertaken in the previous year, in relation to dam safety, must be included in the annual report.

PART G – DESIGN AND CONSTRUCTION

Design

40. At a minimum of 10 days prior to the commencement of construction, the Licensee must submit to the Board final detailed design construction drawings for all structures to be constructed including: the additional storage lagoon, expanded SRI area and the outhouse receiving cell. Design drawings must include new pumps and process piping associated with the upgrades. The final detailed design drawings must be consistent with the drawings which were submitted as part of the Register MN10-082-5 and sealed by a Professional Engineer licensed to practice in Yukon. All construction must be carried out in accordance with the final design drawings.

41. Within 60 days of completion of construction for each structure, the Licensee must submit to the Board, as-built design drawings for the completed structure, sealed by a Professional Engineer licensed to practice in Yukon.

42. Treed buffer zones must be established and maintained as follows:

    a) Not less than 30 metres between the SRI area and the Carcross Rod and Gun Club property line; and

    b) Not less than 300 metres between the sewage treatment and disposal facility and the Watson River Subdivision.

43. The total capacity of the wastewater storage lagoon(s) must be adequate to provide no less than 9.5 months of retention of wastewater at the annual disposal rate.

44. Emergency escape facilities for personnel and wildlife must be provided in each corner of each lined lagoon and at the middle of the long sides of the storage lagoon.

45. A minimum freeboard of 0.6m metres must be maintained in all storage lagoons and sludge drying beds.

46. Public access to the wastewater treatment and disposal facility must be restricted by fencing and a lockable gate. Fencing surrounding the SRI area must be set back no less than 30 metres outside of the SRI area. All fences must be posted with signs warning of the human health hazards associated with the facility.

Minor Modifications

47. Where site conditions require modifications to the designs for water use or Waste related structures previously submitted to the Board, the Licensee must submit a notice to the Board a minimum of 10 days prior to the commencement of the construction schedule:

    a) written details of the modifications proposed to be made to the specifications and quality assurance/quality control procedures previously submitted to the Board as part of the Application,

    b) a written detailed construction schedule and the name and contact number(s) of the operator; and

    c) an explanation for the change, including an assessment of the potential impact on the performance of the works.

    The notice must be sealed by a Professional Engineer licensed to practice in Yukon.

Construction

48. Notification, including the name and phone number of the construction supervisor, must be provided to the Board, in writing, 10 days prior to the start of construction.

49. All works associated with the undertaking must be maintained in good repair.

50. Construction and/or maintenance equipment must be mechanically sound and free of leaks.

51. Granular bedding and backfill material must consist of non-frozen material.

52. Waste substances must be used, transported, stored or disposed of in such a manner that they are not deposited, or allowed to be deposited, into any Watercourse or on any surrounding land, unless authorized by this Licence.

53. Except as authorized by this Licence, no Waste shall enter any Watercourse as a result of any operation carried out by the Licensee.

54. All disturbed ground surfaces must be stabilized in such a manner so as to prevent erosion and surface runoff from carrying sediment into any Watercourse.

Quality Assurance/Quality Control

55. At least 90 days prior to the commencement of construction of the additional storage lagoon, expanded SRI area and the outhouse receiving cell, the Licensee must submit to the Board a construction quality assurance/quality control program. The program must contain, but not be limited to, the following:

    a) methods for ensuring that construction conditions, materials and installation comply with those specified in the design;

    b) methods for monitoring and controlling moisture content, compaction and permeability;

    c) methods and actions to prevent disturbance and compaction of cryoturbate soils in the SRI area;

    d) methods for monitoring and ensuring successful re-vegetation of areas disturbed by construction activities; and

    e) construction records reporting.

PART H – SITE DECOMMISSIONING AND RESTORATION

56. All disturbed ground surfaces must be regraded in a manner which is consistent with the topography of the site and which prevents erosion and surface runoff from carrying sediment into any Watercourse. Where soil conditions permit, disturbed areas must be re-vegetated with appropriate reclamation seeds and/or plant species that are native in Yukon.

57. All construction materials, equipment, temporary structures and debris must be removed from the site upon completion of the work.

SCHEDULE A – MONITORING AND SURVEILLANCE REQUIREMENTS

1. LOCATIONS OF SAMPLING STATIONS

Station Identification	Station Location Description	UTM (Zone 8) NAD 84	
		Easting	Northing
SCp-1	Grab sample from near the outlet pipe of storage cell 1.	-	-
SCp-2	Grab sample from near the outlet pipe of storage cell 2.	-	-
CC-3a	Grab sample from southern anaerobic lagoon.	-	-
CC-3b	Grab sample from northern anaerobic lagoon.	-	-
CC-4d	Grab sample of effluent at any end-of-pipe discharge location in the SRI area. (EQS Compliance Point)	-	-
CC-5	Groundwater well approximately 300 m north of SRI.	515245	6674402
CC-6	Groundwater well approximately 100 m northwest of SRI area.	514910	6674217
CC-7	Groundwater well approximately 200 m southwest of SRI area.	514908	6673922
CC-8	Groundwater well approximately 50 m north of SRI area.	515220	6674186
CC-10	Lagoon drain sump (when used); Southwest end of the aerobic storage lagoon or surface pump flow meter used for discharge.	-	-
NW-1	Groundwater well along southwestern perimeter of SRI area.	515285	6673873
NW-2	Groundwater well along southwestern perimeter of SRI area.	515136	6673985
NW-3	Groundwater well approximately 25 m southwest of the aerobic storage lagoon.	515525	6673665
NW-4	Groundwater well along the southern perimeter of sludge drying beds.	515679	6673607

0074

TABLE A-1

Station Analysis	SCp-1	SCp-2	CC-3a	CC-3b	CC-4d	CC-5	CC-6	CC-7	CC-8	NW-1	NW-2	NW-3	NW-4	CC-10
Faecal Coliforms	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Total Coliforms	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Water Chemistry [b, c]	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Conductivity	1P	1P	2Di	2Di	-	2A	2A	2A	-	-	2A	2A	2A	-
Field Temperature	1P	1P	2Di	2Di	-	2A	2A	2A	-	-	2A	2A	2A	-
BOD_5	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Total Suspended Solids (TSS)	1P	1P	2Di	2Di	2Di	-	-	-	-	-	-	-	-	-
Field pH	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Petroleum Hydrocarbons [d]	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Total Ammonia	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Un-Ionized Ammonia	1P	1P	2Di	2Di	2Di	2A	2A	2A			2A	2A	2A	
NO_2/NO_3	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Lab pH	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Total Phosphorus	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Water Level	M	M	M	M	-	2A	2A	2A	2A	2A	2A	2A	2A	-
Dissolved Oxygen	-	-	-	-	-	2A	2A	2A			2A	2A	2A	-
Flow Rate	-	-	-	-	C	-	-	-	-	-	-	-	-	C

C = Continuous; 1P = Once prior to discharge; 2Di = Twice during discharge; M = Monthly; 2A = Twice annually, in June and September

Discharge period is June 15 to September 30

2. MONITORING SCHEDULE

a) The sludge levels in the anaerobic and storage lagoons must be measured annually, and the measurements must be included in the annual report.

b) Effluent Water Chemistry parameters include: colour, total dissolved solids, chloride, fluoride, sulphate, nitrogen and total metals. Total metals includes: arsenic, barium, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, sodium, uranium, and zinc.

c) Groundwater Water Chemistry parameters include: colour, total dissolved solids, chloride, fluoride, sulphate, nitrogen, and dissolved metals. Dissolved metals includes: arsenic, barium, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, sodium, uranium, and zinc.

d) Petroleum Hydrocarbons include: Benzene, Ethylbenzene, Styrene, Toluene, Acridine, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Fluoranthene, Flourene, Napthalene, Penanthrene, Pyrene, Quinoline, Volatile Petroleum Hydrocarbons in water (VPHw) and Light Extractable Petroleum Hydrocarbons in Water (LEPHw) (Reported in µg/L or mg/L, as applicable)

YUKON WATER BOARD

Pursuant to the *Waters Act* and *Waters Regulation*, the Yukon Water Board hereby grants a Type A water licence for a municipal undertaking to:

Government of Yukon
P.O. Box 2703
Whitehorse YT Y1A 2C6
Fax: (867) 393-6379

APPLICATION:	MN10-082-6	
LICENCE NUMBER:	MN10-082	**LICENCE TYPE:** A
AMENDMENT:	This Licence is amendment 5 of licence number MN10-082	
WATER MANAGEMENT AREA:	02 Yukon	**UNDERTAKING:** Municipal
LOCATION:	Carcross, YT	
MAP CO-ORDINATES:	Latitude: 60° 12' 05" N	Longitude: 134° 43' 20" W
PURPOSE:	To allow for the operation and maintenance of the Carcross Wastewater Treatment Facility, including collection, treatment, and disposal of municipal wastewater and construction of an additional storage lagoon, expanded SRI area and an outhouse receiving cell.	
ORIGINAL LICENCE EFFECTIVE DATE:	October 14, 2011	
AMENDMENT EFFECTIVE DATE:	The effective date of this amendment is the date on which the signature of the Chairperson of the Yukon Water Board is affixed.	
EXPIRY DATE:	August 3, 2036	

This licence shall be subject to the restrictions and conditions contained herein and to the restrictions and conditions contained in the *Waters Act* and the *Waters Regulation* made thereunder.

Approved this 23 day of November, 2020

A Treke (Angela Troke)
Witness

Minister, Executive Council Office
Government of Yukon
Digitally Signed

Issued this 23 day of November, 2020

J. Fisher
Witness

Chairperson, Yukon Water Board
Digitally Signed

PART A – DEFINITIONS

"Act" means *Waters Act* and any amendments thereto.

"Application" means Water Licence Application MN10-082, MN10-082-2, MN10-082-3, MN10-082-4, MN10-082-5 and MN10-082-6, including any additional submissions and/or revisions submitted to the Yukon Water Board by the Licensee, up to the date of the Board's decision.

"Board" means the Yukon Water Board.

"Inspector" means any person designated as an Inspector under the Act.

"Natural Boundary" means the visible high water mark of any lake, river, stream or other body of water where the presence and action of water is so common and usual and so long continued as to mark upon the soil of the bed of the lake, river, stream or other body of water a character distinct from that of the banks thereof, both in respect to vegetation and in respect to the nature of the soil itself. In addition, the best estimates of the edge of dormant or old side channels and marsh areas are considered to be Natural Boundaries.

"Operation and Maintenance Manual" means the *Operation and Maintenance Manual Carcross Wastewater Treatment Facility (2019)* that was submitted as part of the Application and included in Register MN10-082-5 as exhibit 1.3, and any subsequent revisions.

"Regulation" means the *Waters Regulation* made under the Act.

"Sampling Stations" means the stations described in Schedule A of this Licence.

"Spill Contingency Plan" means the *Spill Contingency Plan* that was submitted as part of the Application and included in Register MN10-082 as exhibit 1.6, and any subsequent revisions.

"Sludge Management Plan" means the *Carcross Waste Treatment Facility Sludge Management Plan (April 2016)*, that is included in Register MN10-082-3 as exhibit 1.4, and any subsequent revisions.

"SRI" means the Slow Rate Infiltration Area as described in the Register MN10-082-5, exhibit 1.2.

"Waste" means any substance as defined in the Act.

"Watercourse" means a natural watercourse, body of water or water supply, whether usually containing water or not, and includes groundwater, springs, swamps, and gulches.

"Wetted Perimeter" means the horizontal extent of the present water level while the work is taking place.

PART B – GENERAL CONDITIONS

Other Laws

1. No term of this Licence limits the application of any statutory authority.

2. All construction or installation of works authorized by this Licence must occur on property that the Licensee has the right to enter upon and use for that purpose.

Correspondence

3. Where any direction, notice, order or report under this Licence is required to be in writing, it shall be given:

   a) To the Licensee, when delivered, faxed or mailed by registered mail to the address on page 1 of this Licence and shall be deemed to have been given to the Licensee on the day it was delivered or faxed, or 7 days after the day it was mailed, as the case may be.

   b) To the Board, if delivered, faxed, e-mailed or mailed by registered mail, to the following address:

   Yukon Water Board
   Suite 106, 419 Range Road
   Whitehorse, YT Y1A 3V1

   Fax: (867) 456-3890
   E-mail: ywb@yukonwaterboard.ca

   and shall be deemed to have been given to the Board on the day it was delivered, e-mailed or faxed, or 7 days after the day it was mailed, as the case may be.

   c) The Board or the Licensee may, by notice in writing, change its address for delivery.

Non-Compliance

4. In the event that the Licensee fails to comply with any provision or condition of this Licence, the Board may, subject to the Act, cancel the licence.

Spills and Unauthorized Discharges

5. Where a spill or an unauthorized discharge occurs, that is of a reportable quantity under the Yukon *Spills Regulations,* the Licensee must immediately contact the 24-hour Yukon Spill Report number, (867) 667-7244 and implement the Spill Contingency Plan. A detailed written report on any such event including, but not limited to, dates, quantities, parameters, causes and other relevant details and explanations, must be submitted to the Board not later than 10 days after the occurrence.

6. The Licensee must apply the relevant procedures in the Spill Contingency Plan. The Licensee must review the Spill Contingency Plan annually and must provide a summary of that review, including any revisions to the plan, as a component of the annual report.

7. The Licensee must maintain a log book of all spill or unauthorized discharge occurrences, including spills that are less than the reportable quantities under the Yukon *Spills Regulations.* The log book must be made available at the request of an Inspector. The log book must include, but not necessarily be limited to the:

   a) date and time of the spill;

   b) substance spilt or discharged;

   c) approximate amount spilt or discharged;

   d) distance between the spill or discharge and the nearest Watercourse;

   e) remedial measures taken to contain and clean-up the spill area or to cease the unauthorized discharge; and

   f) geographic coordinates of the spill.

8. The Licensee must include a summary of all spills or unauthorized discharges that occurred during the year reported, as part of the annual report.

9. All personnel must be trained in procedures to be followed and the equipment to be used in the containment of a spill.

10. Prior to the commencement of construction, the Licensee must update the Spill Contingency Plan and provide the updated plan to the Board.

11. The Spill Contingency Plan must be posted on site for the duration of the works.

12. Ten days prior to construction, the Licensee must submit material safety data sheets to the Board for all petroleum products and/or hazardous materials that are to be present during this undertaking.

Fuel Storage and Transfer

13. Fuel, lubricants, hydraulic fluids, coolants and similar substances must be stored and/or transferred a minimum of 30 metres from the Natural Boundary of any Watercourse, in such a way that said substances are not deposited in or allowed to be deposited in waters.

Annual Reports

14. The Licensee must submit annual reports to the Board for the period of January 1 to December 31 of each year. Annual reports are to be submitted on or before March 31 of the year following the year reported. The report must include the information required by the Regulation including, but not necessarily limited to:

    a) A description of the water use operations carried out during the year reported.

    b) The hours of pumping for each day.

    c) Any reclamation to the site.

    d) Any inspection reports regarding the slope stability.

    e) The results of all analyses required by the monitoring program.

    f) The results of the sampling from stations: CC-3a, CC-3b, CC-4d, CC-5, CC-6, CC-7, CC-8, NW-1, CC-10, NW-2, NW-3, NW-4, SCp-1 and SCp-2.

    g) The inspection results, including photographs, repairs or plans for modification required by the physical monitoring program.

    h) A detailed record of any major maintenance work carried out or planned to be carried out that could have an impact on water.

    i) Summaries of all data generated as a result of the monitoring requirements of this Licence, including analysis and interpretation by a qualified individual or firm and a discussion of any variances from baseline conditions or from previous years' data.

    j) Details of any work carried out or planned to be carried out under the Operation and Maintenance Manual.

    k) Details of any work carried out or planned to be carried out under the Sludge Management Plan.

Monthly Reports

15. Unless otherwise specified in this Licence, the Licensee must forward to the Board a copy of all data collected as part of the monitoring programs of this Licence no more than 30 days after the conclusion of the month in which that data was collected.

16. The Licensee must submit to the Board, monthly reports that provide an update on the progress of designs and schedule for the upgrades to the wastewater treatment facility.

16.1 On or before February 15, 2021, the Licensee must provide a written report to the Board that includes all the information required in clauses 34.1 and 34.2.

Reports

17. The Licensee must provide to the Board one unbound, single-sided, paper copy of all reports required by this Licence. All reports must be reproducible by standard photocopier.

18. The Licensee must upload electronic copies of all reports required by this Licence to the Yukon Water Board's online licensing registry, Waterline. Electronic copies must be submitted in one of the following formats: MS Word, MS Excel, or Adobe .pdf format. Water quality results must be uploaded to Waterline in the format outlined in the most recent version of Yukon's "Laboratory Data Submission Standards for Water Quality". This guide is available on the Yukon Water Board website.

PART C – OPERATING CONDITIONS

Description of Water Use and Waste Deposit

19. Subject to clause 19.1, the Licensee is authorized to:

    a) construct and maintain upgrades for a wastewater treatment and disposal facility, which includes an additional storage lagoon, expanded SRI area and an outhouse receiving cell;

    b) collect, store and treat sewage in the wastewater treatment facility;

    c) discharge treated effluent from the wastewater treatment facility to the designated SRI area, from June 15 to September 30 of each year; and

    d) the total volume of water discharged between June 15 and September 30 must not exceed 30,948 cubic metres.

    as described in the Application, and subject to the conditions of this Licence.

19.1 The Licensee is authorized to discharge no greater than 6,000 cubic metres of effluent from the wastewater treatment facility to the designated SRI at a flow rate between 400 and 800 cubic metres per day for a maximum of 15 days between the date of issuance of this Amendment and December 15, 2020.

20. Where there is a discrepancy between the Application and this Licence, the conditions of this Licence shall prevail.

21. The Licensee must operate and maintain sewage collection, sewage treatment and solid waste disposal systems in a manner which is consistent with standard municipal practices for the types of systems being used.

22. Operators transporting septage must be properly trained in the transportation and handling of hazardous substances.

23. Effluent must only be discharged from the wastewater treatment facility through the SRI system and no effluent shall be allowed to directly enter any surface waters, including the wetlands of the Watson River.

24. The Licensee must determine a discharge flow regime based on monthly evapotranspiration rates and monitoring of the SRI area. Monitoring and monthly pumping rates must accord to those described in exhibit 1.2 of Register MN10-082-5.

Notification

25. Other than between the date of issuance of this Amendment and December 15, 2020, the Licensee must notify the Board at least 21 days prior to commencing any effluent discharge.

PART D – PLANS

Operating Plan

26. The wastewater treatment facility, as authorized by this Licence, must be operated in accordance with the Operation and Maintenance Manual and the Sludge Management Plan.

27. The Licensee must provide a final decommissioning plan consistent with *Carcross Waste Treatment Facility, Conceptual Decommissioning Plan* for review and comment within a minimum of 2 years prior to decommissioning.

28. Subject to any required assessments, authorizations or approvals, the Licensee must implement all plans required by this Part of this Licence.

PART E – EFFLUENT QUALITY STANDARDS

29. Subject to clause 29.1, all wastewater discharged from the facility to the SRI area must meet the following effluent quality standards at CC-4d, as described in Schedule A of this Licence:

PARAMETER		**MAXIMUM CONCENTRATION IN A GRAB SAMPLE**
BOD_5		100 mg/L
Total Suspended Soilds (TSS)		100 mg/L[1]
pH		6 - 11
Volatile Organic Compounds (VOCs)	Benzene	4,000 µg/L
	Ethylbenzene	2,000 µg/L
	Styrene	720 µg/L
	Toluene	390 µg/L
Polycyclic Aromatic Hydrocarbons (PAHs)	Acridine	0.5 µg/L
	Anthracene	1.0 µg/L
	Benz[a]anthracene	1.0 µg/L
	Benzo[a]pyrene	0.1 µg/L
	Fluoranthene	2 µg/L
	Fluorene	120 µg/L
	Napththalene	10 µg/L
	Phenanthrene	3 µg/L
	Pyrene	0.2 µg/L

PAH	Quinoline	34 µg/L
Aggregate Hydrocarbons	Volatile Petroleum Hydrocarbons in water, VPHw	1.5 mg/L
	Light Extractable Petroleum Hydrocarbons in Water, LEPHw	0.5 mg/L
Fecal Coliforms		20,000 counts/ 100 mL
Ammonia-N		30 mg/L
Un-Ionized Ammonia		1.25 mg/L[2]

1 If TSS result >100 mg/L between July 15 and September 30, the result is not considered an exceedance of the EQS.

2 The concentration of un-ionized ammonia in effluent must be determined in accordance with the following formula:

$$\textbf{Total Ammonia} \times 1 \div (1 + 10^{9.56-pH})$$

Where:

Total Ammonia is the concentration of total ammonia – namely, un-ionized ammonia (NH_3) plus ionized ammonia (NH_{4+}) – expressed in mg/L as nitrogen (N); and
pH is the pH of the effluent adjusted to 15°C ±1°C.

29.1 The wastewater discharged from the facility to the SRI area may exceed the EQSs set out in clause 29 at CC-4d during discharge that is to occur between the date of issuance of this Amendment and December 15, 2020.

30. The Licensee must sample SCp-1 and SCp-2 prior to discharging treated effluent. Sample results must indicate that EQSs can be achieved.

31. Other than between the date of issuance of this Amendment and December 15, 2020, if the analysis of a water quality sample collected at CC-4d indicates an exceedance of the effluent quality standards in clause 29, the Licensee must notify the Inspector and the Board in writing, within 24 hours of detecting the exceedance.

32. If petroleum hydrocarbons are detected in exceedance of the EQSs in the anaerobic/primary cell, additional sampling is required as described in the Operation and Maintenance Manual.

33. Groundwater must meet the following water quality standards at monitoring stations CC-5, CC-6, CC-7, NW-2, NW-3 and NW-4:

PARAMETER		**MAXIMUM CONCENTRATION FOR ANY SAMPLE**
BOD_5		10 mg/L
pH		6 - 9
Volatile Organic Compounds (VOCs)	Benzene	4,000 µg/L
	Ethylbenzene	2,000 µg/L

VOC	Styrene	720 µg/L
	Toluene	390 µg/L
Polycyclic Aromatic Hydrocarbons (PAHs)	Acridine	0.5 µg/L
	Anthracene	1.0 µg/L
	Benz[a]anthracene	1.0 µg/L
	Benzo[a]pyrene	0.1 µg/L
	Fluoranthene	2 µg/L
	Fluorene	120 µg/L
	Napththalene	10 µg/L
	Phenanthrene	3 µg/L
	Pyrene	0.2 µg/L
	Quinoline	34 µg/L
Aggregate Hydrocarbons	Volatile Petroleum Hydrocarbons in water, VPHw	1.5 mg/L
	Light Extractable Petroleum Hydrocarbons in Water, LEPHw	0.5 mg/L
Fecal Coliforms		0
Ammonia-N		3.7 mg/L
Un-Ionized Ammonia		0.19 mg/L[1]

1 The concentration of un-ionized ammonia in the sample must be determined in accordance with the following formula:

$$\textbf{Total Ammonia} \times 1 \div (1 + 10^{9.56-pH})$$

Where:

Total Ammonia is the concentration of total ammonia – namely, un-ionized ammonia (NH_3) plus ionized ammonia (NH_{4+}) – expressed in mg/L as nitrogen (N); and
pH is the pH of the sample adjusted to 15°C ±1°C.

PART F – MONITORING AND SURVEILLANCE

34. The Licensee must comply with the monitoring and surveillance requirements specified in Schedule A of this Licence.

34.1 The Licensee must conduct water quality sampling of the effluent on the first day of the discharge that is to occur between the date of issuance of this Amendment and December 15, 2020 and thereafter weekly sampling for the parameters in Table A-1 at monitoring station CC-4d for the duration of the discharge.

34.2 During discharge that is to occur between the date of issuance of this amendment and December 15, 2020, the Licensee must maintain a daily photographic record of the discharge as well as monitor and record on a daily basis;

a) the volume of effluent discharged, and

b) the ground surface conditions in the vicinity of the discharged effluent.

35. All data collection and analyses must be conducted in accordance with the most recent edition of *Standard Methods for the Examination of Water and Wastewater*, prepared and published jointly by the American Water Works Association and the Water Pollution Control Federation.

36. The Licensee must compile data relating to the surveillance network program into the annual report.

Soil Salinity Survey

37. The Licensee must conduct a survey of soil salinity (sodium) and vegetation success within the SRI area no less frequently than once every 5 years. A report on the survey must be included in the annual report for that year.

Physical Inspections and Monitoring

38. An annual inspection of the wastewater treatment facility and the sludge drying beds must be carried out by a Professional Engineer licensed to practice in Yukon. A report on the inspection, prepared by the Professional Engineer, must be submitted as part of the annual report. The report must document the inspection locations and methodologies, the results of the inspection, all problems identified, and remedial measures recommended. The status of any remedial measures recommended in the report for the previous year must be appended to the report together with an explanation regarding any recommendation not implemented.

39. Details of any maintenance, inspection and/or surveillance activities undertaken in the previous year, in relation to dam safety, must be included in the annual report.

PART G – DESIGN AND CONSTRUCTION

Design

40. At a minimum of 10 days prior to the commencement of construction, the Licensee must submit to the Board final detailed design construction drawings for all structures to be constructed including: the additional storage lagoon, expanded SRI area and the outhouse receiving cell. Design drawings must include new pumps and process piping associated with the upgrades. The final detailed design drawings must be consistent with the drawings which were submitted as part of the Register MN10-082-5 and sealed by a Professional Engineer licensed to practice in Yukon. All construction must be carried out in accordance with the final design drawings.

41. Within 60 days of completion of construction for each structure, the Licensee must submit to the Board, as-built design drawings for the completed structure, sealed by a Professional Engineer licensed to practice in Yukon.

42. Treed buffer zones must be established and maintained as follows:

    a) Not less than 30 metres between the SRI area and the Carcross Rod and Gun Club property line; and

    b) Not less than 300 metres between the sewage treatment and disposal facility and the Watson River Subdivision.

43. The total capacity of the wastewater storage lagoon(s) must be adequate to provide no less than 9.5 months of retention of wastewater at the annual disposal rate.

44. Emergency escape facilities for personnel and wildlife must be provided in each corner of each lined lagoon and at the middle of the long sides of the storage lagoon.

45. A minimum freeboard of 0.6m metres must be maintained in all storage lagoons and sludge drying beds.

46. Public access to the wastewater treatment and disposal facility must be restricted by fencing and a lockable gate. Fencing surrounding the SRI area must be set back no less than 30 metres outside of the SRI area. All fences must be posted with signs warning of the human health hazards associated with the facility.

Minor Modifications

47. Where site conditions require modifications to the designs for water use or Waste related structures previously submitted to the Board, the Licensee must submit a notice to the Board a minimum of 10 days prior to the commencement of the construction schedule:

    a) written details of the modifications proposed to be made to the specifications and quality assurance/quality control procedures previously submitted to the Board as part of the Application,

    b) a written detailed construction schedule and the name and contact number(s) of the operator; and

    c) an explanation for the change, including an assessment of the potential impact on the performance of the works.

    The notice must be sealed by a Professional Engineer licensed to practice in Yukon.

Construction

48. Notification, including the name and phone number of the construction supervisor, must be provided to the Board, in writing, 10 days prior to the start of construction.

49. All works associated with the undertaking must be maintained in good repair.

50. Construction and/or maintenance equipment must be mechanically sound and free of leaks.

51. Granular bedding and backfill material must consist of non-frozen material.

52. Waste substances must be used, transported, stored or disposed of in such a manner that they are not deposited, or allowed to be deposited, into any Watercourse or on any surrounding land, unless authorized by this Licence.

53. Except as authorized by this Licence, no Waste shall enter any Watercourse as a result of any operation carried out by the Licensee.
54. All disturbed ground surfaces must be stabilized in such a manner so as to prevent erosion and surface runoff from carrying sediment into any Watercourse.

Quality Assurance/Quality Control

55. At least 90 days prior to the commencement of construction of the additional storage lagoon, expanded SRI area and the outhouse receiving cell, the Licensee must submit to the Board a construction quality assurance/quality control program. The program must contain, but not be limited to, the following:

    a) methods for ensuring that construction conditions, materials and installation comply with those specified in the design;

    b) methods for monitoring and controlling moisture content, compaction and permeability;

    c) methods and actions to prevent disturbance and compaction of cryoturbate soils in the SRI area;

    d) methods for monitoring and ensuring successful re-vegetation of areas disturbed by construction activities; and

    e) construction records reporting.

PART H – SITE DECOMMISSIONING AND RESTORATION

56. All disturbed ground surfaces must be regraded in a manner which is consistent with the topography of the site and which prevents erosion and surface runoff from carrying sediment into any Watercourse. Where soil conditions permit, disturbed areas must be re-vegetated with appropriate reclamation seeds and/or plant species that are native in Yukon.

57. All construction materials, equipment, temporary structures and debris must be removed from the site upon completion of the work.

SCHEDULE A – MONITORING AND SURVEILLANCE REQUIREMENTS

1. LOCATIONS OF SAMPLING STATIONS

Station Identification	Station Location Description	UTM (Zone 8) NAD 84	
		Easting	Northing
SCp-1	Grab sample from near the outlet pipe of storage cell 1.	-	-
SCp-2	Grab sample from near the outlet pipe of storage cell 2.	-	-
CC-3a	Grab sample from southern anaerobic lagoon.	–	–
CC-3b	Grab sample from northern anaerobic lagoon.	-	-
CC-4d	Grab sample of effluent at any end-of-pipe discharge location in the SRI area. (EQS Compliance Point)	-	-
CC-5	Groundwater well approximately 300 m north of SRI.	515245	6674402
CC-6	Groundwater well approximately 100 m northwest of SRI area.	514910	6674217
CC-7	Groundwater well approximately 200 m southwest of SRI area.	514908	6673922
CC-8	Groundwater well approximately 50 m north of SRI area.	515220	6674186
CC-10	Lagoon drain sump (when used); Southwest end of the aerobic storage lagoon or surface pump flow meter used for discharge.	-	-
NW-1	Groundwater well along southwestern perimeter of SRI area.	515285	6673873
NW-2	Groundwater well along southwestern perimeter of SRI area.	515136	6673985
NW-3	Groundwater well approximately 25 m southwest of the aerobic storage lagoon.	515525	6673665
NW-4	Groundwater well along the southern perimeter of sludge drying beds.	515679	6673607

2. MONITORING SCHEDULE

a) The sludge levels in the anaerobic and storage lagoons must be measured annually, and the measurements must be included in the annual report.

b) Effluent Water Chemistry parameters include: colour, total dissolved solids, chloride, fluoride, sulphate, nitrogen and total metals. Total metals includes: arsenic, barium, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, sodium, uranium, and zinc.

c) Groundwater Water Chemistry parameters include: colour, total dissolved solids, chloride, fluoride, sulphate, nitrogen, and dissolved metals. Dissolved metals includes: arsenic, barium, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, sodium, uranium, and zinc.

d) Petroleum Hydrocarbons include: Benzene, Ethylbenzene, Styrene, Toluene, Acridine, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Fluoranthene, Flourene, Napthalene, Penanthrene, Pyrene, Quinoline, Volatile Petroleum Hydrocarbons in water (VPHw) and Light Extractable Petroleum Hydrocarbons in Water (LEPHw) (Reported in µg/L or mg/L, as applicable)

TABLE A-1

Station Analysis	SCp-1	SCp-2	CC-3a	CC-3b	CC-4d	CC-5	CC-6	CC-7	CC-8	NW-1	NW-2	NW-3	NW-4	CC-10
Faecal Coliforms	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Total Coliforms	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Water Chemistry [b, c]	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Conductivity	1P	1P	2Di	2Di	-	2A	2A	2A	-	-	2A	2A	2A	-
Field Temperature	1P	1P	2Di	2Di	-	2A	2A	2A	-	-	2A	2A	2A	-
BOD_5	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Total Suspended Solids (TSS)	1P	1P	2Di	2Di	2Di	-	-	-	-	-	-	-	-	-
Field pH	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Petroleum Hydrocarbons [d]	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Total Ammonia	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Un-Ionized Ammonia	1P	1P	2Di	2Di	2Di	2A	2A	2A			2A	2A	2A	
NO_2/NO_3	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Lab pH	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Total Phosphorus	1P	1P	2Di	2Di	2Di	2A	2A	2A	-	-	2A	2A	2A	-
Water Level	M	M	M	M	-	2A	2A	2A	2A	2A	2A	2A	2A	-
Dissolved Oxygen	-	-	-	-	-	2A	2A	2A			2A	2A	2A	-
Flow Rate	-	-	-	-	C	-	-	-	-	-	-	-	-	C

C = Continuous; 1P = Once prior to discharge; 2Di = Twice during discharge; M = Monthly; 2A = Twice annually, in June and September

Discharge period is June 15 to September 30

YUKON WATER BOARD

Pursuant to the *Waters Act* and *Waters Regulation*, the Yukon Water Board hereby grants a Type A water licence for a municipal undertaking to:

City of Dawson
P.O. Box 308
Dawson City YT Y0B 1G0

APPLICATION: MN10-086-2

LICENCE NUMBER: MN10-086

AMENDMENT: This licence shall be deemed to be amendment 1 of licence number MN10-086.

LICENCE TYPE: A **UNDERTAKING:** MUNICIPAL

LOCATION: Dawson City, YT

WATER MANAGEMENT AREA: 02 Yukon

MAP CO-ORDINATES: Latitude: 64° 03' Longitude: 139° 26'

PURPOSE: To operate and maintain a wastewater treatment facility and deposit treated municipal wastewater into the Yukon River.

EFFECTIVE DATE: The effective date of this licence shall be the date on which the signature of the Chairperson of the Yukon Water Board is affixed.

EXPIRY DATE: December 31, 2030.

This licence shall be subject to the restrictions and conditions contained herein and to the restrictions and conditions contained in the *Waters Act* and the *Waters Regulation* made there under.

Approved this 21 day of August, 2014

Witness

Minister, Executive Council Office
GOVERNMENT OF YUKON

Issued this 22nd day of August, 2014

Witness Jacklyn Johnson

Chairperson
YUKON WATER BOARD

PART A – DEFINITIONS

"Act" means *Waters Act* and any amendments thereto.

"Application" means Water Use Application MN10-086 and MN10-086-2, including any additional submission and/or revisions submitted to the Yukon Water Board by the Licensee, up to the date of the Board's decisions.

"Board" means the Yukon Water Board.

"Initial Characterization" means a one year period during which the wastewater facility will characterize its effluent discharge. The initial characterization period shall begin upon commencement of wastewater discharge from the facility.

"Inspector" means any person designated as an Inspector under the Act.

"Natural Boundary" means the visible high water mark of any lake, river, stream or other body of water where the presence and action of the water is so common and usual, and so long continued, as to mark upon the soil of the bed of the lake, stream or other body of water, a character distinct from that of the banks thereof, both in respect to vegetation and in respect to the nature of the soil itself. In addition, the best estimates of the edge of dormant or old side channels and marsh areas are considered to be natural boundaries.

"Regulation" means the *Waters Regulation.*

"Spill Contingency Plan" means the City of Dawson *Spill Response Plan for Petroleum Products (Fuels) and Sewage*.

"Waste" has the meaning as set out in the Act.

"Watercourse" means any stream, lake, pond, river, creek, spring, ravine or swamp, whether ordinarily containing water or not.

PART B – GENERAL CONDITIONS

1. Where there is a discrepancy between the Application and this licence, the conditions of this licence shall prevail.

   Other Laws

2. No condition of the water use licence limits applicability of any statutory authority.

3. All construction or installation of works authorized by this licence shall occur on property that the Licensee has the right to enter upon and use for that purpose.

   Correspondence

4. Where any direction, notice, order or report under this licence is required to be in writing, it shall be given:

a) To the licensee, if delivered, faxed or mailed by registered mail to the following address:

City of Dawson
P.O. Box 308
Dawson City YT Y0B 1G0
Fax: (867) 993-7434

and shall be deemed to have been given to the Licensee on the day it was delivered or faxed, or 7 days after the day it was mailed, as the case may be.

b) To the Board, if delivered, faxed or mailed by registered mail to the following address:

Yukon Water Board
Suite 106, 419 Range Road
Whitehorse YT Y1A 3V1
Fax: (867) 456-3890

and shall be deemed to have been given to the Board on the day it was delivered or faxed, or 7 days after the day it was mailed, as the case may be.

c) The Board or the Licensee may, by notice in writing, change its address for delivery.

Non-Compliance

5. In the event that the Licensee fails to comply with any provision or condition of this licence, the Board may, subject to the Act, cancel the licence.

Spills and Unauthorized Discharges

6. Where a spill or an unauthorized discharge occurs, that is of a reportable quantity under the Yukon *Spills Regulations,* the Licensee shall immediately contact the 24-hour Yukon Spill Report number, (867) 667-7244 and implement the Spill Contingency Plan. A detailed written report on any such event including, but not limited to, dates, quantities, parameters, causes and other relevant details and explanations, shall be submitted to the Board not later than 10 days after the occurrence.

7. The Licensee shall apply the relevant procedures in the Spill Contingency Plan. The Licensee shall review the Spill Contingency Plan annually and shall provide a summary of that review, including any revisions to the plan, as a component of the annual report.

8. The Licensee shall maintain a log book of all spill or unauthorized discharge occurrences, including spills that are less than the reportable quantities under the Yukon *Spills Regulations.* The log book shall be made available at the request of an Inspector. The log book shall include, but not necessarily be limited to:

a) date and time of the spill;
b) substance spilt or discharged;
c) approximate amount spilt or discharged;
d) distance between the spill or discharge and the nearest Watercourse; and
e) remedial measures taken to contain and clean-up the spill area or to cease the unauthorized discharge.

9. The Licensee shall include a summary of all spills or unauthorized discharges that occurred during the year reported, as part of the annual report.

10. All personnel shall be trained in procedures to be followed and the equipment to be used in the containment of a spill.

11. The Spill Contingency Plan shall be posted on site for the duration of the operation.

Fuel Storage and Transfer

12. Fuel, lubricants, hydraulic fluids, coolants and similar substances shall be stored and/or transferred a minimum of 30 metres from the Natural Boundary of any Watercourse, in such a way that said substances are not deposited in or allowed to be deposited in waters.

PART C – OPERATING CONDITIONS

13. The term of this licence is for the period from the effective date to December 31, 2030.

14. Within 30 days of the completion of construction, the Licensee shall submit to the Board, as-built design drawings of the wastewater treatment facility, sealed by a Professional Engineer licensed to practice in the Yukon.

15. The Licensee is hereby authorized to:

a) operate and maintain all associated wastewater collection, storage and treatment systems;

b) collect, store, and treat municipal wastewater at a wastewater treatment facility;

c) discharge treated wastewater from the wastewater treatment facility to the Yukon River up to a maximum of 4,000 m^3/day;

d) dispose of any wastewater treatment plant residual solids at an authorized disposal facility; and

e) collect, convey and discharge stormwater to the Yukon River,

as described in the Application and subject to the conditions of this licence. Where there is a discrepancy between the Application and this licence, then the conditions of this licence shall prevail.

16. All wastewater collection, wastewater treatment and wastewater, residual solids disposal systems, storm water collection, conveyance and disposal systems shall be maintained in good repair in a manner which is consistent with generally accepted municipal practices for the types of systems being used.

17. Within one year of commissioning, the wastewater treatment plant shall be classified through the B.C. Environmental Operators Certification Program. The wastewater treatment facility shall be maintained and operated by personnel with the appropriate qualifications for the type of wastewater system being operated. Copies of the plant classification and operation certification shall be submitted to the Board.

18. Operators transporting solids from the wastewater treatment facility shall be properly trained in the applicable transportation and handling of hazardous substances.

19. The Licensee shall provide notice, in writing to the Board, a minimum of 10 days prior to the commencement of wastewater discharge from the wastewater treatment plant.

20. Where site conditions require minor modifications to the designs submitted to the Board, the Licensee shall notify the Board, a minimum of 10 days in advance, of the details of the modifications or variations from final detailed design, specifications and quality assurance/quality control procedures previously submitted to the Board, provide a detailed construction schedule and the name and contact number(s) of the construction superintendent. The notice shall be in writing and must include an explanation of the reasons for the change and an assessment of the potential impact on the performance of the works. The notice shall be sealed by a Professional Engineer licensed to practice in Yukon.

PART D – EFFLUENT QUALITY STANDARDS

21. Effluent discharged from the wastewater treatment facility shall meet the following quality standards at monitoring station DC-3, as described in Schedule A of this licence:

Parameter	Maximum Authorized Concentration in a Grab Sample
$CBOD_5$[1]	25 mg/L
Total Suspended Solids	25 mg/L
Un-ionized NH_3, expressed as nitrogen (N)	1.25 mg/L at 15˚C ± 1˚C
pH	6-9
Fecal Coliforms	1,000 cfu/100mL
Acute Toxicity – 96-hr LC_{50}	Non-toxic at 100% Concentration

Notes:
1. $CBOD_5$ Test Method – 5 -day BOD test with nitrification inhibition.
2. Reference Method EPS 1/RM13 or EPS 1/RM/50 of Biological Test method: Reference for Determining Acute Lethality of Effluents to Rainbow Trout – Second Edition as amended from time to time.
3. Acute Lethality test may be pH stabilized.

22. Any discharge to a Watercourse must meet an acute bioassay standard of a 96-hour at 100% LC50 bioassay using rainbow trout.

PART E – INITIAL CHARACTERIZATION OF EFFLUENT

23. The Licensee shall conduct an initial characterization of effluent discharge. This initial characterization shall be for a period of one year and shall begin upon commencement of wastewater discharge from the facility.

24. The initial characterization shall be done in compliance with the most current publication of the *Canada-wide Strategy for the Management of Municipal Wastewater Effluent*, published by the Canadian Council of Ministers of the Environment and Schedule A, Table A2 of this Licence.

PART F – MONITORING AND SURVEILLANCE

25. The Licensee shall comply with the monitoring program provided in Schedule A of this Licence.

26. Following the completion of the one year characterization period required by Clause 23 of this Licence, the Licensee shall collect water quality monitoring parameters in accordance with the sampling frequency outlined in Schedule A, Table A3.

27. Samples collected as part of Schedule A shall be grab samples and shall be collected between the hours of 8:00 am and 8:00 pm local time.

28. All data collected shall be in accordance to a nationally recognized sampling protocol (eg. The Inspector's Field Sampling Manual, Second Edition).

29. Laboratory analyses shall be performed by a laboratory accredited under the International Organization for Standardization ISO/IEC 17025: 2005 standard, and the accreditation must include the actual tests being performed by the laboratory.

30. All data collection and analysis shall be conducted in accordance with the most recent edition of Standard Methods for the Examination of Water and Wastewater.

31. Any hydrocarbon sheens or slicks, colour changes, and/or turbidity changes identified during the visual inspections monitoring required by this licence shall be investigated as to the source and a report on the monitoring and investigation shall be submitted to the Board within 15 days of the identification.

32. The Licensee shall comply with the following physical monitoring program:

    a) inspection of the wastewater treatment facility, wastewater collection system, stormwater collection, conveyance and discharge systems shall be in accordance with the Operating and Maintenance Plan; and

    b) inspection of all associated facility structures.

33. A static water level test shall be performed on each of the aeration shafts on an annual basis by a qualified professional. The duration of the test shall be for a minimum of 24 hours and the results of the test shall be submitted to the Board as part of the annual report.

34. All treatment facilities, discharge structures, and hydraulic control structures shall be inspected annually, during the summer months, by a Professional Engineer licensed to practice in Yukon. The results of this inspection, including all problems identified, photographs taken, remedial measures proposed, and remedial measures implemented, shall be compiled in a report and submitted to the Board as part of the annual report.

PART G – REPORTS

35. All reports required to be submitted to the Board will be unbound and reproducible by standard photocopier, accompanied by one electronic copy on a CD/DVD.

36. The Licensee shall provide to the Board 5 additional copies of all reports. The additional copies may be either 5 bound paper copies of 5 electronic copies on individual CDs/DVDs.

37. Electronic copies shall be IBM compatible in one of the following formats: Word 97 – 2003, Excel 97 – 2003 workbooks, or Adobe pdf format. Water quality results must be presented in Excel 97 – 2009.xls format.

38. The Licensee shall compile data relating to the monitoring and surveillance program outlined in Part E and F and Schedule A of this Licence. This information shall be compiled into monthly reports and summarized into annual reports.

Annual Reports

39. The Licensee shall submit annual reports to the Board. The first annual report shall be from the effective date of this License to December 31, 2012. Subsequent reports shall cover the period of January 1 to December 31 of each year and shall be submitted to the Board on or before February 28 of the subsequent year.

40. As part of the first annual report, the Licensee shall provide longitude and latitude or UTM coordinates for each of the monitoring stations identified in Table A1.

41. Annual reports shall include the information required by this Licence, and by the Regulations, including but not necessarily limited to:

    a) summaries of all data generated as a result of the monitoring requirements in Parts E and F of this Licence, prepared by an individual qualified to do so, including at a minimum:

        i. analysis and interpretation of the water data, and
        ii. variances from baseline conditions or from previously collected data;

    b) a record of construction activities for the year reported;

    c) a detailed record of the operation of the wastewater treatment and disposal facilities, including operational difficulties;

    d) a copy of the engineer's report on the treatment facilities, discharge structures, and hydraulic control structures, as detailed in Clause 34 of this Licence;

    e) details of any maintenance, repairs, or improvements to all physical works, including details of how recommendations from inspection reports have been addressed;

    f) results of the annual static water level testing required by Clause 33 of this Licence;

    g) details and results of system integrity and leak detection monitoring and inspections of the treatment shafts, reporting, communications, and any response(s) implemented as part of the leak detection and prevention systems for the treatment shafts;

    h) results of the physical monitoring program as described in Clause 32 of this Licence;

    i) continuous measure of effluent volume. The volume reported will form the basis of sampling frequency requirements for the following year, as described in Schedule A. The annual average daily volume of effluent deposited is the total volume, in cubic metres per day (m^3/day), of effluent deposited via the final discharge point of wastewater system at Station DC-3, divided by the number of days in the calendar year.

Monthly Reports

42. Unless otherwise specified in this Licence, the Licensee shall forward to the Board a copy of all data collected as part of the monitoring programs of this Licence on a monthly basis and no more than 30 days after the conclusion of the month in which that data was collected.

Initial Characterization of Effluent Report

43. The Licensee shall compile and submit to the Board a report titled, The Initial Characterization of Effluent Report. The report shall be submitted within 6 months of the end of the initial characterization of effluent period.

44. The Initial Characterization of Effluent Report shall include at a minimum, but not necessarily be limited to:

    a) a summary of all data collected and generated as a result of the monitoring requirements of the initial characterization of effluent as required by Table A2;

    b) an analysis and interpretation of the water quality data by a qualified individual;

    c) a summary of the substances of concern and an analysis of the adequacy of the Effluent Quality Standards;

    d) recommendations for a revised regular monitoring program and/or updates to the substances in the Effluent Quality Standards, if appropriate;

    e) an explanation of any necessary upgrades required to the treatment facility to improve effluent quality, if appropriate.

45. Ten days prior to initiating the use of the wastewater treatment facility, the Licensee shall submit to the Board an Operating and Maintenance Plan. The facility shall be operated in accordance with that plan.

Treatment Shaft Leak Detection/integrity Monitoring and Assessment Plan

46. The Licensee shall submit to the Board within 60 days of the effective date of this licence a detailed Treatment Shaft Leak Detection/Integrity Monitoring and Assessment Plan for review and approval. The plan should expand on the approach outlined in the Application and include the requirements of this licence. The plan should detail the approach that will be used to incorporate the monitoring data from PW3 into the leak detection monitoring system including establishment of triggers and approach to the development of any required responses/mitigation.

PART H – SITE DECOMMISSIONING AND RESTORATION

47. The Licensee shall submit a decommissioning plan to the Board, 90 days prior to commencing decommissioning activities.

48. As part of final decommissioning, all disturbed ground surfaces shall be re-graded and re-contoured in a manner which is consistent with the topography of the site and which promotes natural re-vegetation and prevents erosion and surface runoff from carrying sediment into any watercourse.

49. All wastewater treatment facility materials, equipment, temporary structures and debris shall be removed from the site as part of final decommissioning of the facility.

SCHEDULE A: MONITORING AND SURVEILLANCE TABLES

Table A1: Location of Sampling Stations

Sampling Station	Water Monitoring Location Description
DC-2	Influent to wastewater treatment facility
DC-3	Effluent from wastewater treatment facility at plant outlet
DC-4	Yukon River, 100 m downstream of effluent outfall
PW3	Dawson City Community Drinking Water Well
DSW-1	Turner Street stormwater outfall
DSW-2	Church Street stormwater outfall
DSW-3	Harper Street stormwater outfall
DSW-4	Princess Street stormwater outfall
DSW-5	Queen Street stormwater outfall
DSW-6	King Street stormwater outfall
DSW-7	York Street stormwater outfall
DSW-8	Duke Street stormwater outfall
DSW-9	Albert Street stormwater outfall

Table A2: Water quality monitoring parameters and frequencies for the one-year initial characterization period

Parameter	Station DC-2	Station DC-3	Station DC-4
Fecal Coliform	-	W	M
Dissolved Oxygen (in-situ)	M	M	M
Temperature (in-situ)	M	M	M
Specific Conductance (in-situ and lab)	M	M	M
$CBOD_5$	M	M	M
Total Suspended Solids	M	W	M
pH (in-situ and lab)	D/M	D/M	M
Surfactants (Linear Alkylbenzene Sulphonate)	M*	M*	-
Total Ammonia Nitrogen	M	M	M
Un-ionized NH_3 as N	M	M	M
Acute Toxicity 96-hr LC_{50} (rainbow trout)	-	M	-
TKN (ammonia & organic N)	M	M	M
Total Phosphorus	M	M	M
Formaldehyde	M*	M*	-
Flow Rate	D	D	-
Nitrate as N	-	M	M

Table A3: Water quality monitoring parameters and sampling frequency following the initial one year characterization period

Parameter	Station DC-2	Station DC-3	Station DC-4
Fecal Coliform	-	M	M
Dissolved Oxygen (in-situ)	M	M	M
Temperature (in-situ)	M	M	M
Specific Conductance	M	M	M
$CBOD_5$	M	M or BW	M
Total Suspended Solids	M	M or BW	M
pH (in-situ and lab)	M	M	M
Total Ammonia Nitrogen	M	M	M
Un-ionized NH_3 as N	M	M or BW	M
Acute Lethality	-	M* or M*Q	-
TKN (ammonia & organic N)	M	M	M
Flow Rate	D	D	-

Table A4: Water quality monitoring parameters and sampling frequency for Integrity Monitoring (at Station PW3)

Parameter	Station PW3
Fecal Coliform	M
Total Coliform	M
Dissolved Oxygen (in-situ)	M
Temperature (in-situ)	M
Specific Conductance	M
pH (in-situ and lab)	M
Total Ammonia Nitrogen	M
TDS	M
TSS	M
Nitrate-N	M
Nitrite-N	M

Table A5: Water quality monitoring parameters and sampling frequency for Stormwater Outfalls

Parameter	DSW-1, 2, 3, 4, 5, 6, 7, 8 and 9
Visual assessment of flow	M**
Visual assessment of hydrocarbon sheens or slicks	M**
Visual assessment of colour and colour changes	M**
Visual assessment of turbidity and turbidity changes	M**

Table A6: Monitoring Schedule Frequency Legend

Symbol	Frequency
D	Daily
M	Monthly
M or BW[2,3]	Monthly or Bi-weekly (twice monthly)
M*	Monthly from May 1 to September 30 only (during open water), sampling events at least two weeks apart
M*Q[4,5]	Individual sampling event in March, at least 60 days apart from other Acute Lethality sampling Events (First Quarter); and Monthly from May 1 to September 30 only (during open water), sampling events at least two weeks apart; and Individual sampling event in December, at least 60 days apart from other Acute Lethality sampling Events (Fourth Quarter)
M**	Monthly during open water

Notes:

1. Calendar year is defined as January to December for a given year.

2. If the annual average daily volume of effluent deposited for the previous calendar year is $\leq$ 2,500 m^3/day, sampling in the following calendar year for $CBOD_5$, Total Suspended Solids and Un-ionized NH_3 shall be conducted monthly.

3. If the annual average daily volume of effluent deposited for the previous calendar year is >2,500 m^3/day, sampling in the following calendar year for $CBOD_5$, Total Suspended Solids and Un-ionized NH_3 shall be conducted bi-weekly.

4. If the annual average daily volume of effluent deposited for the previous calendar year is $\leq$ 2,500 m^3/day, sampling in the following calendar year for Acute Lethality shall be conducted monthly from May 1 to September 30 only.

5. If the annual average daily volume of effluent deposited for the previous calendar year is >2,500 m^3/day, sampling in the following calendar year for Acute Lethality shall be conducted monthly from May 1 to September 30, with one additional sampling event in March and one additional sampling even in December of the same calendar year.

YUKON WATER BOARD

Pursuant to the *Waters Act* and *Waters Regulation*, the Yukon Water Board hereby grants a Type A water licence for a municipal undertaking to:

City of Dawson
P.O. Box 308
Dawson City, YT
Y0B 1G0

APPLICATION:	MN10-086-3
LICENCE NUMBER:	MN10-086
AMENDMENT:	This licence shall be deemed to be amendment 2.
LICENCE TYPE:	A **UNDERTAKING**: MUNICIPAL
LOCATION:	Dawson City, YT
WATER MANAGEMENT AREA:	02 Yukon
MAP CO-ORDINATES:	Latitude: 64° 03' Longitude: 139° 26'
PURPOSE:	To operate and maintain a wastewater treatment facility and deposit treated municipal wastewater into the Yukon River.
ORIGINAL LICENCE EFFECTIVE DATE:	May 2, 2011
AMENDMENT EFFECTIVE DATE:	The effective date of this amendment shall be the date on which the signature of the Chairperson of the Yukon Water Board is affixed.
EXPIRY DATE:	December 31, 2030

This licence shall be subject to the restrictions and conditions contained herein and to the restrictions and conditions contained in the *Waters Act* and the *Waters Regulation* made there under.

Approved this 19 day of October, 2017

Witness

Minister, Executive Council Office
Government of Yukon

Issued this 20 day of October, 2017

Witness

Vice-Chairperson
Yukon Water Board

PART A – DEFINITIONS

"Act" means *Waters Act* and any amendments thereto.

"Application" means Water Licence Application MN10-086, applications for amendments MN10-086-2, and MN10-086-3, including any additional submission and/or revisions submitted to the Yukon Water Board by the Licensee, up to the date of the Board's decisions.

"Board" means the Yukon Water Board.

"Engineered work" means work of a scope that is undertaken with the preparation of drawings, and specifications prepared by a Professional Engineer licenced to practice in Yukon for the purposes of improvements to the wastewater facility.

"Inspector" means any person designated as an Inspector under the Act.

"Natural Boundary" means the visible high water mark of any lake, river, stream or other body of water where the presence and action of the water is so common and usual, and so long continued, as to mark upon the soil of the bed of the lake, stream or other body of water, a character distinct from that of the banks thereof, both in respect to vegetation and in respect to the nature of the soil itself. In addition, the best estimates of the edge of dormant or old side channels and marsh areas are considered to be natural boundaries.

"Regulation" means the *Waters Regulation.*

"Spill Contingency Plan" means the City of Dawson's *Spill Response Plan for Petroleum Products (Fuels) and Sewage.*

"Substantial Completion Certificate" means documentation issued by a Professional Engineer licenced to practice in Yukon when an engineered project has reached a stage of substantial completion as defined by the contract documents for that project.

"Waste" means any substance as defined in the Act.

"Watercourse" means a natural watercourse, body of water or water supply, whether usually containing water or not, and includes groundwater, springs, swamps, and gulches.

PART B – WATER USE AND DEPOSIT OF WASTE

1. The Licensee is hereby authorized to:

   a) operate and maintain a municipal wastewater treatment facility and associated discharge systems;
   b) store and treat municipal wastewater at a wastewater treatment facility;
   c) discharge treated wastewater from the wastewater treatment facility to the Yukon River up to a maximum of 4,000 m^3/day; and
   d) treat and dispose of any wastewater treatment plant residual/ bio-solids at an authorized disposal facility,

   as described in the Application and subject to the conditions of this licence.