

AMENDING APPROVAL

PROVINCE OF ALBERTA

**ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT
R.S.A. 2000, c.E-12, as amended.**

APPROVAL NO.: 454-02-02

APPLICATION NO.: 005-454

EFFECTIVE DATE: **APR 26 2010**

EXPIRY DATE: September 1, 2017

APPROVAL HOLDER: **NEWELL REGIONAL SERVICES CORPORATION**

ACTIVITY: Construction, operation and reclamation of the

..... Newell Regional Waterworks System

is subject to the attached terms and conditions.

Designated Director under the Act 

Date Signed **APR 26 2010**

TERMS AND CONDITIONS ATTACHED TO APPROVAL

Environmental Protection and Enhancement Act Approval No 454-02-00 is hereby amended as follows:

1. The Terms and Conditions attached to the approval are repealed and replaced with:

PART 1: DEFINITIONS

SECTION 1.1: DEFINITIONS

1.1.1 All definitions from the Act and the regulations apply except where expressly defined in this approval.

1.1.2 In all PARTS of this approval:

- (a) "Act" means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended;
- (b) "alternate program" means the Alternate Laboratory Data Quality Assurance Program, as detailed in the Department's *Laboratory Data Quality Assurance Policy Procedures and Guidelines*;
- (c) "approved laboratory" means laboratory accredited to the requirements of ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, for the drinking water tests methods specified by the Director;
- (d) "bacteriological analysis" means the analysis of water for the presence of *E. coli* or total coliforms;
- (e) "chemical" means any substance that is added or used as part of the treatment process;
- (f) "chlorine residual" means free chlorine, or combined chlorine or total chlorine;
- (g) "clearwell" means a reservoir for the storage of treated water at the water treatment plant which is of sufficient volume to prevent the need to vary the filtration rate with variations in demand and that may also be used to provide chlorine contact time for disinfection;
- (h) "contact time" ("T₁₀") means the time taken in minutes for 10% of the water to pass through the particular process unit;
- (i) "continuous monitoring" means flow measurement or sample analysis through in-line equipment that creates flow measurements or frequent, discrete sample analysis output and includes a data recorder;



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- (j) "CT" means disinfectant residual in mg/L multiplied by the contact time;
- (k) "CT_{lowest actual}" means the lowest CT calculated in a particular day:

$$CT_{\text{lowest actual}} = C \times \frac{T_{10}}{T} \times \frac{V_{\text{min}}}{Q_{\text{peak}}}$$

Where: C = lowest recorded daily free chlorine residual concentration (in milligrams per litre) at the point T₁₀ is measured;

$$\frac{T_{10}}{T} = 0.3; \quad \text{OR}$$

Varies based on the empirical method using typical baffling conditions as per Appendix D in the Standards and Guidelines Document; OR

Varies based on a tracer study, where

T₁₀ = the contact time established from the most recent tracer study; and

T = the calculated contact time, assuming no short-circuiting and obtained by dividing the treated water chlorine contact storage volume that was used to determine T₁₀, by the flow that was used to determine T₁₀;

V_{min} = the daily minimum volume (in Litres) of treated water in the treated water chlorine contact storage reservoir;

Q_{peak} = maximum recorded hourly flow (Litres per minute) or twice the daily average flow (Litres per minute)

- (l) "CT_{required}" means the CT required to demonstrate the specified Log reduction of *Giardia* cysts and / or viruses as specified in Appendix A or Appendix B of the "Standards and Guidelines Document";
- (m) "CT_{performance ratio}" means CT_{lowest actual} / CT_{required};
- (n) "day" means calendar day;
- (o) "direct integrity testing" means a physical test applied to a membrane unit in order to identify and isolate integrity breaches;

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- (p) "Director" means an employee of the Government of Alberta designated as a Director under the Act;
- (q) "disinfectant residual" means total concentration of disinfectant in water;
- (r) "disinfection" means a chemical or physical process of treating water to inactivate microorganisms;
- (s) "*E. coli*" means *Escherichia coli* bacteria;
- (t) "electronic reporting" means submitting monitoring results to the Director as required in this approval, electronically through the secure internet website provided by Alberta Environment at <http://www.environment.alberta.ca/1506.html>;
- (u) "GCDWQ" means the *Guidelines for Canadian Drinking Water Quality*, published by Health Canada, as amended;
- (v) "grab", when referring to a sample, means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;
- (w) "ISO/IEC" means the International Organization for Standardization / the International Electrotechnical Commission;
- (x) "Log reduction" means the base 10 logarithm of the ratio of raw water concentrations divided by the treated water concentration of total *Giardia* cysts, *Cryptosporidium* oocysts or viruses;
- (y) "MAC" means the Maximum Acceptable Concentration, specified in the GCDWQ for a particular parameter;
- (z) "PWR" means the *Potable Water Regulation*, as amended;
- (aa) "produced water" means all water that has gone through treatment and has entered the distribution system;
- (bb) "Provincial Laboratory of Public Health" means the:
 - (i) Environmental Microbiology Provincial Laboratory of Public Health, University of Alberta Hospital, Edmonton, Alberta, or the
 - (ii) Provincial Laboratory of Public Health, Foothills Hospital, Calgary, Alberta;
- (cc) "raw water" means untreated source water from water wells, surface water intakes or infiltration galleries that constitute the water supply;

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- (dd) "regulations" means the regulations enacted pursuant to the Act and as amended;
- (ee) "Standards and Guidelines Document" means the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*, published by the Department, as amended;
- (ff) "water transmission main" means the pipe carrying potable water from the water treatment plant to water distribution systems.
- (gg) "water treatment plant" means the physical components of the Newell Regional Services Corporation waterworks system that are used to produce potable water including components associated with the management of any wastes generated during treatment;
- (hh) "User Agreement" means the *Drinking Water Quality User Agreement* signed by the approval holder and the Director.

PART 2: GENERAL PROVISIONS

SECTION 2.1: GENERAL

- 2.1.1 The approval holder shall comply with all conditions in this approval.
- 2.1.2 Any conflict between the approval application and the terms and conditions of this approval shall be resolved in favour of this approval.
- 2.1.3 The terms and conditions of this approval do not affect any rights or obligations created under any other authorization issued by the Department.
- 2.1.4 The approval holder shall carry out all electronic reporting, or cause all electronic reporting to be carried out in accordance with the User Agreement.
- 2.1.5 The approval holder shall comply with the terms and conditions of the User Agreement.
- 2.1.6 The terms and conditions of this approval are severable. If any term or condition of this approval or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.
- 2.1.7 If the approval holder monitors for any substances or parameters, which are the subject of limits in this approval more frequently than is required, using procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the next reports required by this approval.



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PART 3: PLANNING, CONSTRUCTION AND / OR UPGRADING REQUIREMENTS

SECTION 3.1: PLANNING

- 3.1.1 The approval holder shall undertake a risk assessment of the waterworks system to ascertain the integrity, reliability and the long-term sustainability of the system to provide safe drinking water according to the following:
- (a) The assessment shall be performed in accordance with the Standards and Guidelines Document, *Facility Risk Assessment Standards*; and
 - (b) the assessment shall be performed by an independent consultant approved by the Director.
- 3.1.2 The completed assessment shall be submitted to the Director once every five years from the effective date of this approval.

SECTION 3.2: CONSTRUCTION

- 3.2.1 The approval holder shall construct the water treatment plant upgrade in accordance with:
- (a) the plans and specification in application 005-454 submitted to the Director; and
 - (b) this approval.
- 3.2.2 The approval holder shall notify the Director upon commencement of operation of the upgraded water treatment plant.
- 3.2.3 If construction of the water treatment plant upgrade is not completed on or before December 31, 2010, the approval holder shall:
- (a) notify the Director of the new date of completion; and
 - (b) apply to the Director to cancel or amend this approval.

SECTION 3.3: UPGRADE

- 3.3.1 If a MAC specified in the *GCDWQ* is changed or a new limit MAC is added in the *GCDWQ* and the waterworks system will be unable to meet the new or revised MAC, then the approval holder shall make application to the Director to upgrade the waterworks system such that the system will be able to meet the new or revised MAC within 5 years of the date the new or revised guideline was published.



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PART 4: OPERATIONAL REQUIREMENTS

SECTION 4.1: WATERWORKS SYSTEM

4.1.1 Prior to the commencement of operation of the upgraded water treatment plant, the approval holder shall:

- (a) operate; and
- (b) maintain

a waterworks system which shall include all of the following:

- (i) a source consisting of surface water from Lake Newell,
- (ii) raw water storage;
- (iii) a water treatment plant consisting of:
 - (A) pre-treatment chlorination,
 - (B) coagulation addition,
 - (C) rapid sand filtration units,
 - (D) disinfection by chlorination;

and

- (iv) clearwell.

4.1.2 After the commencement of operation of the upgraded water treatment plant, the approval holder shall:

- (a) operate; and
- (b) maintain

a waterworks system which shall include all of the following:

- (i) a source consisting of surface water from Lake Newell, NE 1/4-6-18-14-W4M, and
- (ii) a water treatment plant consisting of:
 - (A) coagulation and flocculation,

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- (B) membrane filtration units,
 - (C) disinfection by chlorination (primary);
 - (D) clearwell; and
 - (E) disinfection by chloramination (secondary).
- 4.1.3 The approval holder shall maintain a system *Operations Program* that shall include, at a minimum, all of the information in SCHEDULE 1 of this approval.
- 4.1.4 The approval holder shall update the *Operations Program* at least on an annual basis.

SECTION 4.2: FACILITY CLASSIFICATION AND CERTIFIED OPERATOR REQUIREMENTS

FACILITY CLASSIFICATION

- 4.2.1 The water treatment facility in this approval is classified as Class II in accordance with the *Water and Wastewater Operators' Certification Guidelines*.

CERTIFIED OPERATOR

- 4.2.2 At all times, the operation of the waterworks system shall be performed by, or under the direction of, a person who holds a valid Level II (or higher) Water Treatment Operators Certificate;

SECTION 4.3: PERFORMANCE LIMITS

POTABLE WATER QUALITY STANDARDS

- 4.3.1 All produced water shall meet the Treated Water Limits specified in Schedule 3.
- 4.3.2 After the commencement of operation of the upgraded water treatment plant, at all times, the disinfection and filtration, together, shall achieve:
- (a) a total 4-Log reduction for viruses; and
 - (b) a total 4-Log reduction for *Giardia* and *Cryptosporidium (sp)*.
- 4.3.3 In addition to compliance with the limits specified in Schedule 3, the produced water shall comply with the *Potable Water Quality* requirements of the *Potable Water Regulation*, as amended, for those parameters specified in Schedule 4, and any parameters added to the GCDWQ.

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SECTION 4.4: CHEMICALS USED

- 4.4.1 The approval holder shall not add a substance, material or compound to water being treated to be potable unless the substance, material or compound:
- (a) conforms to American National Standards Institute and National Sanitation Foundation ANSI/NSF Standard 60 or Standard 61 for health effects;
 - (b) is certified for potable use by an agency accredited to the requirements of ISO/IEC 9000 and ISO/IEC 14001; and
 - (c) is added in a dosage that does not exceed the dosage specified as Maximum Use; or
 - (d) as otherwise authorized in writing by the Director.

SECTION 4.5: WASTE STREAM

- 4.5.1 Prior to the commencement of operation of the upgraded water treatment plant waste streams shall be released only as follows:
- (a) filter backwash shall be discharged to the storm sewer;
 - (b) filter-to-waste shall be discharged to the storm sewer;
 - (c) any other waste stream shall be discharged as authorized in writing by the Director.
- 4.5.2 After the commencement of operation of the upgraded water treatment plant, waste streams shall be released only as follows:
- (a) Floc basin blowdown shall be discharged to
 - (i) the reject water retention pond, and
 - (ii) the City of Brooks stormwater system;
 - (b) filter backwash shall be discharged
 - (i) the reject water retention pond, and
 - (ii) the City of Brooks stormwater system;
 - (c) filter-to-waste shall be discharged to
 - (i) the reject water retention pond, and

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- (ii) the City of Brooks stormwater system;
- (d) membrane draindown shall be discharged to
 - (i) the reject water retention pond, and
 - (ii) the City of Brooks stormwater system;
- (e) membrane clean in place waste shall be discharged to
 - (i) the reject water sump,
 - (ii) the reject water retention pond, and
 - (iii) the City of Brooks stormwater system;
- (f) membrane rejection stream shall be discharged to
 - (i) the reject water retention pond, and
 - (ii) the City of Brooks stormwater system;
- (g) process drains shall be discharged to
 - (i) the reject water retention pond, and
 - (ii) the City of Brooks stormwater system;
- (h) sanitary wastewater shall be discharged to the brooks wastewater collection system; and
- (i) any other waste stream shall be discharged as authorized in writing by the Director.

PART 5: MONITORING REQUIREMENTS

SECTION 5.1: MONITORING

5.1.1 The approval holder shall monitor the waterworks system in accordance with:

- (a) Schedule 2; and
- (b) Schedule 3.

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SECTION 5.2: DATA QUALITY ASSURANCE

- 5.2.1 With respect to any monitoring required pursuant to this approval, all samples shall be:
 - (a) collected;
 - (b) preserved;
 - (c) stored;
 - (d) handled; and
 - (e) analysed in accordance with:
 - (i) the *Standard Methods for the Examination of Water and Wastewater*, published by the American Public Health Association, the American Waterworks Association and the Water Environment Federation, as amended or replaced from time to time, or
 - (ii) a method authorized in writing by the Director.
- 5.2.2 Any analysis of a sample required pursuant to this approval shall be done only in an approved laboratory or in a laboratory that complies with the Department's alternate program.
- 5.2.3 Data results of the on-line or continuous monitoring equipment must be validated to ensure that the results reflect the actual quality of the water and is not an electronic or meter spike by direct or indirect means.

PART 6: REPORTING REQUIREMENTS

SECTION 6.1: CONTRAVENTION REPORTING

- 6.1.1 In addition to any other reporting required pursuant to this approval, the Act, or the regulations, the approval holder shall immediately report to the Director any contravention of this approval, either:
 - (a) by telephone at 1-780-422-4505; or
 - (b) by a method:
 - (i) in compliance with the release reporting provisions in the Act and the regulations, or
 - (ii) authorized in writing by the Director.



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- 6.1.2 In addition to any other reporting required pursuant to this approval, the Act, or the regulations, the approval holder shall immediately report to the Director by a method specified in 6.1.1, any structural or equipment malfunction in the waterworks system that may affect the quality or supply of potable water.
- 6.1.3 In addition to the immediate reporting in 6.1.1, the approval holder shall provide a report to the Director:
- (a) in writing; or
 - (b) by a method:
 - (i) in compliance with the release reporting provisions in the Act and the regulations, or
 - (ii) authorized in writing by the Director

within seven (7) calendar days after the discovery of the contravention, or within another time period specified in writing by the Director, unless the requirement for the report is waived by the Director.

- 6.1.4 The report required in 6.1.3 shall contain, at a minimum, the following information:
- (a) a description of the contravention;
 - (b) the date of the contravention;
 - (c) the duration of the contravention;
 - (d) the legal land description of the location of the contravention;
 - (e) an explanation as to why the contravention occurred;
 - (f) a summary of all preventive measures and actions that were taken prior to the contravention;
 - (g) a summary of all measures and actions that were taken to mitigate any effects of the contravention;
 - (h) a summary of all measures that will be taken to address any remaining effects and potential effects related to the contravention;
 - (i) the number of the approval issued under the Act for the waterworks system, and the name of the approval holder who held the approval at the time the contravention occurred;

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- (j) the name, address, phone number and responsibilities of all persons operating the waterworks system at the time the contravention occurred;
- (k) the name, address, phone number and responsibilities of all persons who had charge, management or control of the waterworks system at the time that the contravention occurred;
- (l) a summary of proposed measures that will prevent future contraventions, including a schedule of implementation for these measures;
- (m) any information that was maintained or recorded under this approval, as a result of the incident; and
- (n) any other information required by the Director in writing.

6.1.5 Where a sample does not meet the Maximum Acceptable Concentration as specified in the GCDWQ for one or more of the physical, inorganic, organic chemical or pesticide parameters in Schedule 4, in addition to any reporting or other requirements pursuant to the Act, or the Regulations, the approval holder shall carry out the corrective actions set out in the "*Action Protocol for Exceedances of Chemical Health Parameters in Drinking Water*", as amended.

SECTION 6.2: MONTHLY REPORTING

- 6.2.1 The approval holder shall compile and retain monthly reports at the water treatment plant.
- 6.2.2 The monthly report in 6.2.1 shall include, at a minimum:
- (a) the name, telephone and fax numbers of all certified operators;
 - (b) the analytical results for all parameters required to be monitored in accordance with this approval during the month;
 - (c) the locations of all sampling performed during the month in accordance with this approval;
 - (d) the name and manufacturer of all treatment chemicals added during the month, and each manufacturer as listed by the certified agency that tested the chemical to ANSI/NSF Standard 60 or Standard 61;
 - (e) the results of all required monitoring and measurements conducted during the month in accordance with this approval; and
 - (f) a description of any problems experienced, and corrective actions taken at the waterworks system during the month.



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SECTION 6.3: ANNUAL REPORTING

- 6.3.1 In addition to any other reporting required under the Act, the regulations and this approval, the approval holder shall compile and submit an annual report, by February 28 of the year following the calendar year in which the information on which the report is based was collected.
- 6.3.2 The annual report in 6.3.1 shall contain, at a minimum, all of the following information:
- (a) a summary of the monthly reports, specifying the monthly minimum, average, and maximum results for each parameter monitored, excluding bacteriological results, for each month;
 - (b) monthly totals for volumes measured;
 - (c) a summary of the number, sampling dates and analytical results of the bacteriological samples analyzed for each month;
 - (d) the results of any other compliance monitoring done during the year pursuant to this approval, that was not included in any monthly report;
 - (e) a description of any problems experienced, and corrective actions taken at the waterworks system during the year; and
 - (f) any changes to the *Operations Program*.

SECTION 6.4: ELECTRONIC REPORTING

- 6.4.1 The Director may, by notice in writing, require the approval holder to submit periodic reports:
- (a) in an electronic format; and
 - (b) with the following frequency:
 - (i) monthly, to the Director on or before the end of the month following the month in which the information on which the report is based was collected,
 - (ii) annually, to the Director on or before February 28 of the year following the year in which the information on which the report is based was collected, or
 - (iii) as specified in writing by the Director.



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6.4.2 The approval holder who receives a notice as specified in section 6.4.1 shall comply with the notice.

PART 7: RECORD KEEPING REQUIREMENTS

SECTION 7.1: GENERAL

7.1.1 The approval holder shall:

- (a) record the following information; and
- (b) maintain and retain the following records for five (5) years from the date the record was created:
 - (i) bacteriological analysis results,
 - (ii) daily records, including but not limited to:
 - (A) flow meter readings,
 - (B) chlorine concentrations,
 - (C) treatment chemical dosages,
 - (D) and all the requirements of Schedule 3 specific to daily monitoring
required under this approval;
 - (iii) all monthly reports required under this approval, and
 - (iv) records of action taken by the approval holder to correct contraventions of potable water quality limits, including the following information for each contravention:
 - (A) name and address of the person who discovered the contravention, and
 - (B) copies of all notifications to the public.

7.1.2 The approval holder shall retain the following records for the life of the waterworks system:

- (a) the *Operations Program*;
- (b) copies of all:

TERMS AND CONDITIONS ATTACHED TO APPROVAL

- (i) applications submitted to the Department for an approval regarding the waterworks system and correspondence related to the approval,
 - (ii) engineering drawings and specifications,
 - (iii) project reports,
 - (iv) construction documents,
 - (v) as-built drawings,
 - (vi) reports of inspections conducted by the Department,
 - (vii) correspondence and written notifications sent to the Department regarding a proposed extension of a water distribution system, replacement of a portion of a water distribution system, expansion or modification of potable water storage within the water distribution system,
 - (viii) approvals issued under the Act for the waterworks system,
 - (ix) annual reports, and
 - (x) reports prepared pursuant to sections 6.1.3 and 6.1.4;
- (c) all physical, organic and inorganic chemical and pesticide analytical results required pursuant to this approval, excluding daily monitoring.

7.1.3 The results and records in sections 7.1.1(b) shall contain, at a minimum, all of the following information:

- (a) the date, location and time of monitoring, and the name of the person collecting the sample;
- (b) identification of the sample type, including, but not limited to whether the sample is taken as required in the approval, a repeat sample, a source or potable water sample, or other special purpose sample;
- (c) date of analysis;
- (d) laboratory name and person responsible for performing analysis;
- (e) the analytical method used; and
- (f) the results of the analysis.

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7.1.4 The approval holder shall immediately provide any records, reports or data required under this approval to the Director or an inspector, upon request.

PART 8: RECLAMATION REQUIREMENTS

SECTION 8.1: GENERAL

8.1.1 Where the land surface has been disturbed during construction, expansion, modification or repair of any portion of a waterworks system, reclamation of the land surface to equivalent land capability shall be performed following the construction, expansion, modification or repair, in accordance with the Standards and Guidelines Document.

8.1.2 Within six months after the waterworks system, or a portion of the waterworks system, permanently ceases operation, the approval holder shall submit a reclamation plan to the Director for the portion of the system that is no longer in operation.

8.1.3 The approval holder shall not commence reclamation of the waterworks system until that person has received an amendment to this approval from the Director for the reclamation.

DATED APR 26 2010


DESIGNATED DIRECTOR UNDER THE ACT

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SCHEDULE 1

OPERATIONS PROGRAM

1. Routine Operational Procedures, which shall, at a minimum, include:
 - a. contact name and telephone numbers for the system owner, system operator, engineering consultants and equipment suppliers;
 - b. operating instructions:
 - i. general description of treatment process and operating procedures,
 - ii. performance requirements, and
 - iii. location of equipment major controls;
 - c. general maintenance schedule;
 - d. general maintenance instructions for:
 - i. treatment / process equipment,
 - ii. monitoring equipment,
 - iii. pumping equipment,
 - iv. membrane repair and replacement procedures.

2. Routine Operational Procedures for Monitoring and Analysis, which shall, at a minimum, include:
 - a. operational and compliance tests to be performed;
 - b. bacteriological quality monitoring plan;
 - c. methods used for monitoring and analysis;
 - d. locations of monitoring points;
 - e. laboratory data quality assurance information;
 - f. direct integrity testing; and
 - g. data collection and analysis of integrity testing.

3. Emergency Response Plan, which shall, at a minimum, include steps to be taken in the event of the following:
 - a. turbidity / particle counts exceeding the limits;
 - b. chemical overfeed;
 - c. no chemical or coagulant feed;
 - d. low chlorine residual;

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SCHEDULE 1

OPERATIONS PROGRAM

- e. equipment breakdown;
 - f. flood;
 - g. power failure;
 - h. the waterworks system becoming inoperable, including steps in providing an alternate potable water supply;
 - i. cover-off in the event that the Certified Operator is not available to operate the system;
 - j. list of contacts; Alberta Environment, Alberta Health, Regional Health Authorities, Fire Department, Disaster Coordinator, and other agencies; and
 - k. date of last update.
4. Copy of the as-built drawings.

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SCHEDULE 2 – RAW WATER and WASTE STREAM

Monitoring, Measuring (since volume is not monitoring) and Reporting Frequency Requirements

PARAMETER	STATION LOCATION	MONITORING TYPE and FREQUENCY	REPORTING FREQUENCY
Turbidity	RAW WATER ENTERING THE WATER TREATMENT PLANT	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4
Volume		Metered, Once per day Reported as Total in m ³	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4
Total Chlorine	WASTE STREAM PRIOR TO ENTERING CITY OF BROOKS STORMWATER SYSTEM	Grab sample, Once per month	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
FILTRATION - Treated Water TURBIDITY					
Turbidity <i>Prior to the commencement of operation of the upgraded water treatment plant</i>	INDIVIDUAL FILTER TRAIN #1 TRAIN #2 TRAIN #3 TRAIN #4 <i>after individual filter train at a point upstream of the clearwell</i>	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Report MAXIMUM DAILY value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	≤ 0.3 NTU, at least 95% of the samples on a daily basis; and ≤ 1 NTU, 100% of the time
			Report number of cumulative minutes per day the turbidity was between 0.3 and 1 NTU	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	

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SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Turbidity <i>After the commencement of operation of the upgraded water treatment plant</i>	MEMBRANE FILTER TRAIN #1 TRAIN #2 TRAIN #3 TRAIN #4 <i>after individual filter train at a point upstream of the clearwell</i>	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Report MAXIMUM DAILY value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	≤ 0.1 NTU, at least 99% of the samples on a daily basis; and ≤ 0.3 NTU, 100% of the time
			Report number of cumulative minutes per day the turbidity was between 0.1 and 0.3 NTU	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	
Membrane Direct Integrity Testing <i>After the commencement of operation of the upgraded water treatment plant</i>	MEMBRANE FILTER #1 MEMBRANE FILTER #2 MEMBRANE FILTER #3 MEMBRANE FILTER #4	Once per day	Report Daily Value Pass/ Fail	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	Pass 4-log reduction credit

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SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
MEMBRANE FILTER - Treated Water PARTICLE COUNTS					
Particle Counts of particles greater than 2 um <i>After the commencement of operation of the upgraded water treatment plant</i>	MEMBRANE FILTER TRAIN #1 TRAIN #2 TRAIN #3 TRAIN #4 <i>after individual filter train at a point upstream of the clearwell</i>	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Report MAXIMUM DAILY value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	≤ 20 particles/mL at least 99% of the samples on a daily basis; and < 50 particles/mL, 100% of the time
			In addition to the Membrane Filter limit specified above, the approval holder shall comply with a treated particle count level from each individual membrane filter train of less than or equal to:		
			# of cumulative minutes per day the particles/ml was between 20 and 50 particles/ml.	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	the readings between 20 and 50 particles/ml for a period of ≤ 15 minutes per day)

KM

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
<i>Treated Water PRIMARY DISINFECTION</i>					
Chlorine Residual	ENTERING WATER TRANSMISSION MAIN(S) (where "C" is measured for log reduction of Viruses)	Continuous, with ≤ 5 minute sampling intervals	Record MINIMUM value mg/L Recorded Once per day	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	≥ 0.2 mg/L and ≤ 3.0 mg/L as Total Chlorine

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SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
<i>Treated Water PRIMARY DISINFECTION – ALL SYSTEMS</i>					
CT _{required}	ENTERING WATER TRANSMISSION MAIN(S)	Once per day	Daily values	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	≥ 1 except for one day per month, which must be > 0.9
CT _{lowest actual}		Calculated Once per day			
CT performance ratio <i>Giardia</i> <i>Prior to the commencement of operation of the upgraded water treatment plant</i>		Calculated Once per day			
CT performance ratio <i>Viruses</i> <i>After the commencement of operation of the upgraded water treatment plant</i>	ENTERING WATER TRANSMISSION MAIN(S)	Calculated Once per day	Daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	≥ 1

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Volume	CLEARWELL	Once per day	MINIMUM daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	
Flow	ENTERING WATER TRANSMISSION MAIN(S)	Continuous	MAXIMUM hourly flow or twice the daily average flow in L/Min Recorded Once per day	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	
pH	ENTERING WATER TRANSMISSION MAIN(S)	Grab Sample Once per day	Daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	6.5 -8.5 pH

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SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Temperature	ENTERING WATER TRANSMISSION MAIN(S)	Continuous	Daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	
Treated Water SECONDARY DISINFECTION – ALL SYSTEMS					
Total Trihalomethanes (TTHM)	ENTERING WATER TRANSMISSION MAIN	1 Grab sample every 3 months	Analytical Results	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	As per the PWR
Treated Water – ALL SYSTEMS					
The physical, inorganic and organic chemical and pesticide parameters listed in Schedule 4, and any new parameters with MAC's published in the GCDWQ	PRIOR TO ENTERING WATER TRANSMISSION MAIN	2 Grab samples per annum One during winter (December to February); and One during summer (June to August)	Analytical Results	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	As per the PWR

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SCHEDULE 4

Table of Physical, Inorganic chemicals, Organic chemicals and Pesticides

Substance	Specific Parameter	Substance	Specific Parameter
Physical Parameters (Primary and Secondary)	Colour; pH; Total Dissolved Solids	Organic Chemicals and Pesticides (Primary)	Atrazine + metabolites; Benzene; Benzo(a)pyrene; Bromoxynil; Carbon Tetrachloride; Chlorpyrifos; Cyanazine; Cyanobacterial toxins (as Microcystin – LR; Diazinon; Dicamba; 1,2-Dichlorobenzene; 1,4-Dichlorobenzene; 1,2-Dichlorethane; Dichloromethane; 2,4-Dichlorophenol; 2,4-D; Diclofop-methyl; Diuron; Dimethoate; Ethylbenzene; Glyphosate; Malathion; Methoxychlor; Metolachlor; Metribuzin; Monochlorobenzene; Nitrilotriacetic Acid (NTA); Pentachlorophenol; Picloram; Simazine; Terbufos; Tetrachloroethylene; 2,3,4,6-Tetrachlorophenol; Trichloroethylene; 2,4,6-Trichlorophenol; Trifluralin; and Vinyl Chloride.
Inorganic chemicals (Primary)	Antimony; Arsenic; Barium; Boron; Bromate; Cadmium; Chloramines; Chromium; Cyanide; Fluoride; Lead; Mercury; Nitrate; Nitrite; Selenium; and Uranium;		
Inorganic and Organic Chemicals (Secondary)	Aluminum; Ammonia; Calcium; Chloride; Copper; Total Hardness; Iron; Magnesium; Manganese; Silver; Sodium; Sulphate; Sulphide; Total Organic Carbon; Xylenes (total); and Zinc;		

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