



**APPROVAL  
PROVINCE OF ALBERTA**

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

APPROVAL NO. ..... 638-02-00

APPLICATION NO. .... 012-638

EFFECTIVE DATE: ..... March 30, 2004

EXPIRY DATE: ..... March 1, 2014

APPROVAL HOLDER ..... Epcor Water Services Inc.

ACTIVITY: ..... Construction, Operation and Reclamation of the Edmonton waterworks system

.....

is subject to the attached terms and conditions.

Designated Director under the Act .....  
PARK POWELL

Date Signed ..... March 30, 2004

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

### **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) "application" means the written submissions to the Director in respect of application number 012-638 and any subsequent applications for amendments of approval number 638-02-00;
  - (c) "Bacteriological Analysis" means the analysis of water for the presence of *E. coli* or total coliforms;
  - (d) "chemical" means any substance that is added or used as part of the treatment process;
  - (e) "contact time" means the  $T_{10}$  value established for that portion of the process by the most recent tracer studies undertaken by EPCOR Water Services, where  $T_{10}$  is the time it takes for 10% of the tracer to pass through the contact section;
  - (f) "continuous monitoring" is sampling or flow through analysis equipment that creates an output signal at a predetermined frequency;
  - (g) "CT" means disinfectant residual in mg/L multiplied by the contact time ( $T_{10}$ ) in minutes;
  - (h) "day" means any sampling period of 24 consecutive hours from 12:00 midnight to 12:00 midnight;
  - (i) "decommissioning" means the dismantling and decontamination of a water treatment plant undertaken subsequent to the termination or abandonment of any activity or any part of any activity regulated under the Act;
  - (j) "Director" means an employee of the Government of Alberta designated as a Director under the Act;
  - (k) "E. coli" means *Escherichia coli* bacteria;

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- (l) "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://www3.gov.ab.ca/env/water/dwq/disclaimer.cfm>;
- (m) "grab sample" means an individual sample collected in less than 30 minutes and which is representative of the substance sampled with the exception of *Giardia*, *Cryptosporidium* and Virus sampling;
- (n) "independent laboratory" means a laboratory with documented quality assurance and quality control programs, including participation in inter-laboratory studies and accredited by Canadian Association for Environmental Analytical Laboratories (CAEAL);
- (o) "Log reduction " means the base logarithm of the percent inactivation, calculated by adding the log removal by physical treatment and log removal by disinfection;
- (p) "moving hourly average" means an average that is recalculated at regular increments to cover the previous 60 minutes;
- (q) "plant bypass" means water that is diverted from the treated water reservoirs;
- (r) "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;
- (s) "raw water" means untreated source water from water wells, surface water intakes or infiltration galleries that constitute the water supply;
- (t) "regional customers" means organizations using treated water provided by EPCOR (Rossdale and E.L. Smith) to supply distinct distribution systems;
- (u) "regulations" means the regulations issued pursuant to the Act and as amended;
- (v) "remote monitoring" means monitoring of the SCADA system by an operator at a location other than on-site;
- (w) "User Agreement" means the *Drinking Water Quality User Agreement* signed by the Approval Holder and the Director;

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- (x) "volume estimated" means approximate volume calculated from field measurements;
- (y) "water distribution system" means a system of pipes, valves, fittings and appurtenances, including associated pressure reducing stations, that is used to convey potable water in a waterworks system to the service connection for a property;
- (z) "water treatment plant" means the physical components of the waterworks system that are used to produce potable water including components associated with the management of any wastes generated during treatment and includes the land at Rossdale (9469 Rossdale Road) and E.L. Smith (3900 E.L. Smith Road).
- (aa) "waterworks system" means any system providing potable water to a municipality, municipal development, industrial development, privately-owned development, private utility or watering point and includes any or all of the following components:
  - (i) a source(s);
  - (ii) water supply lines;
  - (iii) on-stream and off-stream water storage facilities;
  - (iv) water pumphouses;
  - (v) water treatment plant(s);
  - (vi) potable water transmission mains;
  - (vii) potable water storage facilities;
  - (viii) potable water pumping facilities;
  - (ix) water distribution system(s);
- (bb) "week" means any consecutive 7-day period; and
- (cc) "year" means calendar year.

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### **PART 2: GENERAL**

#### **SECTION 2.1: GENERAL**

- 2.1.1 The approval holder shall immediately report by telephone any contravention of the terms and conditions of this approval to the Director at 1-780-422-4505.
- 2.1.2 In addition to reporting pursuant to 2.1.1, the approval holder shall submit, within 7 days, a written report to the Director.
- 2.1.3 The approval holder shall carry out all electronic reporting, or cause all electronic reporting to be carried out in accordance with the User Agreement.
- 2.1.4 The approval holder shall comply with the terms and conditions of the User Agreement.
- 2.1.5 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.
- 2.1.6 All abbreviations used in this approval follow those given in *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, the American Water Works Association, and the Water Environment Federation, as amended, unless otherwise specified in this approval.
- 2.1.7 *Environmental Protection and Enhancement Act* Approval No. 638-01-00 is cancelled.

#### **SECTION 2.2: RECORD KEEPING**

- 2.2.1 The approval holder shall record and retain all the following information in respect of any sampling conducted or analyses performed for a minimum of three years:
  - (a) the place, date and time of sampling;
  - (b) the dates the analyses were performed;
  - (c) the analytical techniques, methods or procedures used in the analyses;
  - (d) the names of the persons or operator crew who collected and analyzed each sample; and
  - (e) the results of the analyses.

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### **SECTION 2.3: ANALYTICAL REQUIREMENTS**

- 2.3.1 Collection, preservation, storage, handling and analysis of samples, and reporting shall be conducted in the following manner or as otherwise specified in writing by the Director:
- (a) the *Standard Methods for the Examination of Water and Wastewater* published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, as amended;
  - (b) the *Methods Manual for Chemical Analysis of Water and Wastes*, Alberta Environmental Centre, Vegreville, Alberta, 1996, AECV96-M1, as amended; and
  - (c) other methods accredited by CAEAL or otherwise authorized in writing by the Director.
- 2.3.2 The approval holder shall ensure that all analytical data for the parameters to be monitored in this approval are produced by laboratories accredited for those parameters by CAEAL or organizations designated by the Standards Council of Canada to provide such accreditation, unless the Director provides prior written authorization for exemption from such accreditation.
- 2.3.3 The approval holder shall ensure that all the monitoring equipment used is calibrated in accordance with the equipment manual specifications or according to the quality assurance and calibration procedures referred to in 4.1.2 on or before January 1, 2005
- 2.3.4 The bacteriological samples that are required by this approval shall be forwarded to the Provincial Laboratory of Public Health unless otherwise authorized in writing by the Director.

### **PART 3: CONSTRUCTION AND UPGRADING REQUIREMENTS**

#### **SECTION 3.1: CONSTRUCTION AND UPGRADE**

##### **WATERWORKS SYSTEM UPGRADE AND CONSTRUCTION REQUIREMENTS**

- 3.1.1 The approval holder shall submit a written request to the Director and receive an amendment to this approval or a written authorization, prior to proceeding with any changes to the plants, other than those identified in this approval.
- 3.1.2 The approval holder shall construct the UV inactivation system at the Rosssdale Water Treatment Plant in accordance with application number 011-638.

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- 3.1.3 Prior to commencement of operation of the UV inactivation system at the Rossdale Water Treatment Plant, the approval shall submit to the Director a written monitoring, reporting and operations plan, and receive a letter of acknowledgement prior to its implementation.

### **PART 4: OPERATIONS**

#### **SECTION 4.1: WATERWORKS SYSTEM**

- 4.1.1 The approval holder shall operate and maintain a waterworks system which shall include all of the following:
- (a) a source consisting of:
    - (i) surface water from the North Saskatchewan River;
  - (b) Rossdale (plants 1,2) and E.L. Smith (plant 4) water treatment plants with treatment capabilities for:
    - (i) coagulation;
    - (ii) flocculation;
    - (iii) taste and odour control with powder activated carbon;
    - (iv) clarification;
    - (v) primary chlorination;
    - (vi) rapid sand filtration;
    - (vii) UV inactivation;
    - (viii) pH adjustment;
    - (ix) chloramination;
    - (x) fluoridation;
  - (c) a treated water reservoir(s) located at Rossdale and E.L. Smith;
  - (d) a water distribution system including treated water field reservoirs; and
  - (e) water supply to regional customers.

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- 4.1.2 The approval holder shall have an Operations Plan consisting of:
- (a) a designated bacteriological sampling location table and plan;
  - (b) emergency response plan;
  - (c) operations treatment procedures;
  - (d) a plan to demonstrate log inactivation;
  - (e) a distribution system maintenance program; and
  - (f) quality assurance and calibration procedures for all water quality testing and monitoring equipment.
- 4.1.3 The approval holder shall submit a copy of the Operations Plan to the Director on or before January 1, 2005 and receive a letter of acknowledgement.
- 4.1.4 The approval holder shall have a standard operating plan available in the control room on or before January 1, 2005.

### **SECTION 4.2: REMOTE MONITORING**

- 4.2.1 The E.L Smith water treatment plant can be remotely monitored from the Rossdale control room.
- 4.2.2 The E.L. Smith waterworks system shall be remotely monitored according to the E.L Smith Remote Operating Plan, as amended.

### **SECTION 4.3: CERTIFIED OPERATOR REQUIREMENTS**

- 4.3.1 The day to day operation of the Rossdale and E.L. Smith waterworks system shall be performed by, or under the direction of, the following number of certified operators who hold the following valid level of certification:
- (a) for the Water treatment plant, a minimum of:
    - (i) two Level IV Water Treatment (WT) Operators;
    - (ii) three Level III WT Operators;
    - (iii) one Level II WT Operator in charge of each shift;
  - (b) for the Water Distribution System, a minimum of:
    - (i) one Level IV Water Distribution (WD) Operator;

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- (ii) two Level III WD Operators; and
- (iii) three Level II WD Operators.

### **SECTION 4.4: CHEMICALS USED**

- 4.4.1 The approval holder shall not use any chemicals exceeding the dosage specified as Maximum Use in the Standard 60, published by the National Sanitation Foundation and the American National Sanitation Standards Institute (NSF/ANSI), as amended or replaced from time to time, unless otherwise authorized in writing by the Director.
- 4.4.2 The approval holder shall notify the Director in writing prior to the use of new chemicals in the waterworks system.

### **SECTION 4.5: WASTE STREAMS**

- 4.5.1 The approval holder shall release only the following waste streams from the water treatment plant:
  - (a) clarifier blowdown;
  - (b) clarifier washdown;
  - (c) filter backwash;
  - (d) filter-to-waste;
  - (e) plant bypass;
  - (f) low lift screen wash;
  - (g) high lift pump cooling water;
  - (h) pilot plant drain;
  - (i) sample streams;
  - (j) stormwater collection systems and
  - (k) any other waste stream authorized in writing by the Director.
- 4.5.2 Waste streams shall be released only as follows:
  - (a) all waste streams as listed in section 4.5.1 shall be discharged to the North Saskatchewan River; and

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(b) any other waste stream authorized in writing by the Director.

4.5.3 The approval holder shall monitor waste streams from the Rossdale and E.L. Smith waterworks systems as required in TABLE 4-1.

**TABLE 4-1: WASTE STREAMS MONITORING REQUIREMENTS**

<b>WASTE STREAMS</b>			
<b>Waste Stream</b>	<b>Frequency</b>	<b>Sample type</b>	<b>Parameters</b>
Clarifier blowdown	Monthly	Calculated	TSS
			Aluminum
			Volume
		Grab	pH
Clarifier washdown water	Each discharge	Calculated	TSS
			Aluminum
			Volume
		Grab	Total chlorine residual
			pH
Backwash water.	Monthly	Calculated	TSS
			Aluminum
			Volume
		Grab	Total chlorine residual
			pH
Filter to waste	Monthly average	Continuous	Turbidity
			pH
			Total chlorine residual
			Volume
Water treatment plant by-pass	Each discharge	Continuous	Turbidity
			pH
			Total chlorine residual
			Volume

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- 4.5.4 The approval holder shall submit a report evaluating impacts to the North Saskatchewan River and alternatives to the current method of all waste stream discharges, prior to January 1, 2006 and receive a letter of acknowledgement from the Director.
- 4.5.5 If the report evaluating impacts to the North Saskatchewan River and alternatives to the current method of all waste stream discharges is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director.

**SECTION 4.6: LOG REDUCTIONS**

- 4.6.1 The approval holder shall use the treatment methods listed in Table 4-2 to achieve the log reduction requirements.

**TABLE 4-2: TREATMENT CREDITS**

TREATMENT PROCESS	CONDITION	CREDIT
Physical Particle Removal	Filter Effluent Turbidity Limit in Table 5-1	2.5 log <i>Giardia</i> removal
		2.0 log Virus removal
		2.0 log <i>Cryptosporidium</i> removal
Chlorine Disinfection	CT Calculation Formula in the Operations Plan	<i>Giardia</i> inactivation according calculation
		Virus inactivation according calculation
Chloramine Disinfection	CT Calculation Formula in the Operations Plan	<i>Giardia</i> inactivation according calculation
		Virus inactivation according calculation
UV Inactivation	UV Limits in Table 5-1	1.0 log <i>Giardia</i> inactivation
		1.0 log <i>Cryptosporidium</i> inactivation

**SECTION 4.7: EMERGENCY OPERATION**

**LOG INACTIVATION**

- 4.7.1 If the log *Giardia*, *Cryptosporidium* or virus inactivation of the water entering the distribution system does not meet the required Log inactivation, the approval holder shall take the following corrective action:
  - (a) stop production to or bypass the distribution system;
  - (b) follow actions in the Boil Water Advisory Guidelines, as amended; and

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- (c) report to the Director at 1-780-422-4505.

### **CHLORINE RESIDUALS**

4.7.2 If residual disinfectant concentration in the water in the water distribution system measured as total is less than 0.5 mg/L, the approval holder shall take the following corrective action:

- (a) follow actions in the Boil Water Advisory Guidelines, as amended; and
- (b) report to the Director at 1-780-422-4505.

### **FLUORIDE RESIDUALS**

4.7.3 If the daily fluoride residual is < 0.6 mg/L or > 1.0 mg/L, the approval holder shall take the following corrective action:

- (a) adjust and recalibrate the feed rate;
- (b) take a sample to verify that a fluoride residual level of  $\geq 0.6$  mg/L and  $\leq 1.0$  mg/L has been obtained; and
- (c) report to the Director at 1-780-422-4505.

### **BACTERIOLOGICAL ANALYSIS**

4.7.4 The approval holder shall immediately take the corrective action outlined in the latest version of the *Communication and Action Protocol for Failed Bacteriological Results in Drinking Water for Waterworks Systems Authorized Under the Environmental Protection and Enhancement Act*, as amended, if any sample of treated water taken for bacteriological analysis contains:

- (a) any Total Coliform bacteria; or
- (b) any E. coli.

4.7.5 The approval holder shall immediately notify the Director by telephone at 1-780-422-4505 if the presence of any organisms specified in 4.7.4(a) or 4.7.4(b) is detected in any sample of treated water.

### **WATERMAIN REPAIRS OR MAINTENANCE**

4.7.6 In the event of watermain repairs or maintenance that may compromise the water quality in the distribution system, the following testing shall be undertaken upon completion of the work:

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- (a) bacteriological analysis for Total Coliform bacteria and E. coli;
- (b) total chlorine residual; and
- (c) turbidity.

4.7.7 The approval holder shall not place the watermain back into service unless the total chlorine and turbidity tests, listed in 4.7.6, meets the criteria as required in TABLE 5-1.

**PART 5: LIMITS**

**SECTION 5.1: WATERWORKS**

5.1.1 The approval holder shall comply with the limits specified in TABLE 5-1.

**TABLE 5-1: LIMITS**

PARAMETERS	LIMIT	DESIGNATED SAMPLING LOCATION
Treated water Turbidity	≤ 0.3 NTU	AFTER EACH FILTER (ROSSDALE, PLANTS 1 & 2 – 9 FILTERS) (E.L. SMITH, PLANT 4, 1 – 12 FILTERS)
Treated water pH	6.5 – 8.5	ENTERING DISTRIBUTION SYSTEM (ROSSDALE PLANTS 1 & 2) (E.L. SMITH, PLANT 4)
Treated water Fluoride	≥ 0.6 mg/L and ≤ 1.0 mg/L	
Log inactivation of <i>Giardia</i>	≥ 4.0	ENTERING DISTRIBUTION SYSTEM (ROSSDALE PLANTS 1 & 2)
Log inactivation of <i>Cryptosporidium</i>	≥ 2.0	
Log inactivation of Virus	≥ 4.0	
Log inactivation of <i>Giardia</i>	≥ 4.0	ENTERING DISTRIBUTION SYSTEM (E.L. SMITH, PLANT 4)
Log inactivation of <i>Cryptosporidium</i>	≥ 2.0	
Log inactivation of Virus	≥ 4.0	
UV light dose	≥40 mJ/cm <sup>2</sup> (when UV inactivation is used)	EACH UV REACTOR (9 REACTORS - ROSSDALE PLANTS 1 & 2) (3 REACTORS - E.L. SMITH, PLANT 4)
Water flow rate through each UV reactor	< 50 MLD (when UV inactivation is used)	EACH UV REACTOR (9 REACTORS - ROSSDALE PLANTS 1 & 2)
	< 120 MLD (when UV inactivation is used)	EACH UV REACTOR (3 REACTORS - E.L. SMITH, PLANT 4)

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<b>PARAMETERS</b>	<b>LIMIT</b>	<b>DESIGNATED SAMPLING LOCATION</b>
Treated water Total Chlorine residual	$\geq 0.5$ mg/L and $\leq 2.5$ mg/L	DISTRIBUTION SYSTEM (FIELD RESERVOIRS) (RANDOM LOCATIONS)
Treated water Turbidity	$\leq 5$ NTU	
Bacteriological Analysis	As per the latest edition of the <i>Guidelines for Canadian Drinking Water Quality</i>	DISTRIBUTION: BACTERIOLOGICAL

5.1.2 The approval holder shall shut down the fluoridation system if the approval holder is unable to test fluoride residual or if the fluoride testing equipment is measuring fluoride residual inaccurately.

5.1.3 In addition to the limits specified in TABLE 5-1 the waterworks system shall be maintained and operated in a manner so that the produced water and distributed water shall comply with the maximum acceptable concentrations specified in the *Guidelines for Canadian Drinking Water Quality* (GCDWQ), as amended.

**PART 6: MONITORING AND REPORTING**

**SECTION 6.1: WATERWORKS**

6.1.1 The approval holder shall monitor the Rossdale and E.L. Smith waterworks systems as required in TABLE 6-1.

6.1.2 The approval holder shall report to the Director:

(a) in the manner, and

(b) at the frequency

as specified in TABLE 6-1.

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**TABLE 6-1: MONITORING AND REPORTING - WATERWORKS SYSTEM**

PARAMETERS	FREQUENCY	SAMPLE TYPE	DESIGNATED SAMPLING LOCATION	REPORTING MANNER/ FREQUENCY
<b>ROSSDALE WATER TREATMENT PLANT</b>				
<b>MATRIX: RAW WATER (ROSSDALE PLANTS 1 AND 2, COMBINED)</b>				
Raw water Flow	Once per day, recorded as total volume	Continuous	ENTERING TREATMENT PLANT, ROSSDALE PLANTS 1 & 2 (PRIOR TO CHEMICAL ADDITION)	Electronic reporting in accordance with 2.1.3 and 6.1.2 and Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and Written monthly reporting in accordance with 6.1.8 and 6.1.9 and Written annual report in accordance with 6.1.12 and 6.1.14
Raw water Turbidity	Once per day, recorded as Average, Maximum, Minimum or Grab	Continuous or Grab		
Raw water pH	Once per day, recorded as Average, Maximum, Minimum or Grab	Continuous or Grab		
Raw water Fluoride	Once per week	Grab		
Raw water <i>Cryptosporidium</i> levels	Once per month	Grab		
Raw water <i>Giardia</i> levels	Once per month	Grab		
Raw water Virus levels	Twice per year	Grab		
<b>MATRIX: PARTIALLY TREATED WATER (ROSSDALE PLANT 1 AND 2, COMBINED)</b>				
Treated water Turbidity	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals	AFTER FILTER (Filter#1 through Filter#9), ROSSDALE PLANTS 1 & 2	Electronic reporting in accordance with 2.1.3 and 6.1.2 and Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and Written monthly reporting in accordance with 6.1.8 and 6.1.9 and Written annual report in accordance with 6.1.12 and 6.1.14
Treated water Particle Counts (>2 µm)	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals		
Treated water Turbidity	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals	COMBINED FILTER EFFLUENT, ROSSDALE PLANTS 1 & 2	
Treated water Particle Counts (>2 µm)	Once per day, recorded as Average, Maximum	Calculated		
Ultraviolet light transmittance of filtered water	Twice per day, recorded as Average	Grab		

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<b>PARAMETERS</b>	<b>FREQUENCY</b>	<b>SAMPLE TYPE</b>	<b>DESIGNATED SAMPLING LOCATION</b>	<b>REPORTING MANNER/ FREQUENCY</b>
UV light dose	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals	EACH UV REACTOR (9 REACTORS at ROSSDALE PLANTS 1 & 2)	Electronic reporting in accordance with 2.1.3 and 6.1.2 and
Water flow rate through each UV reactor	Once per day, recorded as total volume and maximum flow rate per day	Continuous		Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and
Treated water Free Chlorine	Once per day, recorded as Average, Minimum	Continuous at one minute intervals	PRIOR TO AMMONIA ADDITION, USED TO CALCULATE LOG INACTIVATION, ROSSDALE PLANTS 1 & 2	Written monthly reporting in accordance with 6.1.8 and 6.1.9 and Written annual report in accordance with 6.1.12 and 6.1.14
<b>MATRIX: TREATED WATER (ROSSDALE PLANTS 1 AND 2, COMBINED)</b>				
Treated water Flow	Once per day, recorded as Average, Maximum, Minimum	Continuous	ENTERING DISTRIBUTION SYSTEM, ROSSDALE PLANTS 1 & 2	Electronic reporting in accordance with 2.1.3 and 6.1.2 and electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and Written monthly reporting in accordance with 6.1.8 and 6.1.9 and
Treated water pH	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals		
Treated water Turbidity	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals		
Treated water Combined Chlorine Residual	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals		
Treated Water Fluoride	Once per day, recorded as Average, Maximum, Minimum	Continuous at 15 minute intervals	ENTERING DISTRIBUTION SYSTEM, ROSSDALE PLANTS 1 & 2	Written annual report in accordance with 6.1.12 and 6.1.14
Log inactivation of <i>Giardia</i>	Once per day, recorded as Average, Maximum, Minimum	Continuous, calculated as moving hourly average		
Log inactivation of <i>Cryptosporidium</i>	Once per day, recorded as Average, Maximum, Minimum	Continuous, calculated as moving hourly average		
Log inactivation of Virus	Once per day, recorded as Average, Maximum, Minimum	Continuous, calculated as moving hourly average		

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PARAMETERS	FREQUENCY	SAMPLE TYPE	DESIGNATED SAMPLING LOCATION	REPORTING MANNER/ FREQUENCY
<b>E. L. SMITH WATER TREATMENT PLANT</b>				
<b>MATRIX: RAW WATER (E. L. SMITH PLANT 4)</b>				
Raw water Flow	Once per day, recorded as total volume	Continuous	ENTERING TREATMENT PLANT, E.L. SMITH PLANT 4 (PRIOR TO CHEMICAL ADDITION)	Electronic reporting in accordance with 2.1.3 and 6.1.2 and Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and Written monthly reporting in accordance with 6.1.8 and 6.1.9 and Written annual report in accordance with 6.1.12 and 6.1.14
Raw water Turbidity	Once per day, recorded as Average, Maximum, Minimum or grab	Continuous or Grab		
Raw water pH	Once per day, recorded as Average, Maximum, Minimum or grab	Continuous or Grab		
Raw water Fluoride	Once per week	Grab		
Raw water <i>Cryptosporidium</i> levels	Once per month	Grab		
Raw water <i>Giardia</i> levels	Once per month	Grab		
Raw water Virus levels	Twice per year	Grab		
<b>MATRIX: PARTIALLY TREATED WATER (E. L. SMITH PLANT 4)</b>				
Treated water Turbidity	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals	AFTER FILTER (Filter#1 through Filter#12) E.L. SMITH PLANT 4	Electronic reporting in accordance with 2.1.3 and 6.1.2 and Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and Written monthly reporting in accordance with 6.1.8 and 6.1.9 and
Treated water Particle Counts (>2 µm)	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals		
Treated water Turbidity	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals	COMBINED FILTER EFFLUENT, E. L. SMITH PLANT 4	Written monthly reporting in accordance with 6.1.8 and 6.1.9 and
Treated water Particle Counts (>2 µm)	Once per day, recorded as Average, Maximum	Calculated		
Ultraviolet light transmittance of filtered water	Twice per day, recorded as Average	Grab	COMBINED FILTER EFFLUENT, E. L. SMITH PLANT 4	Written annual report in accordance with 6.1.12 and 6.1.14
UV light dose	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals	EACH UV REACTOR (3 REACTORS at E. L. SMITH PLANT 4)	Electronic reporting in accordance with 2.1.3 and 6.1.2 and Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and Written monthly reporting in accordance with 6.1.8 and 6.1.9 and Written annual report in accordance with 6.1.12 and 6.1.14
Water flow rate through each UV reactor	Once per day, recorded as total volume and maximum flow rate per day	Continuous		

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PARAMETERS	FREQUENCY	SAMPLE TYPE	DESIGNATED SAMPLING LOCATION	REPORTING MANNER/ FREQUENCY
Treated water Free Chlorine	Once per day, recorded as Average, Minimum	Continuous at one minute intervals	PRIOR TO AMMONIA ADDITION, USED TO CALCULATE LOG INACTIVATION, E. L. SMITH PLANT 4	
<b>MATRIX: TREATED WATER (E. L. SMITH PLANT 4)</b>				
Treated water Flow	Once per day, recorded as total volume	Continuous	ENTERING DISTRIBUTION SYSTEM, E. L. SMITH PLANT 4	Electronic reporting in accordance with 2.1.3 and 6.1.2 and Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and Written monthly reporting in accordance with 6.1.8 and 6.1.9 and Written annual report in accordance with 6.1.12 and 6.1.14
Treated water pH	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals		
Treated water Turbidity	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals		
Treated water Combined Chlorine Residual	Once per day, recorded as Average, Maximum, Minimum	Continuous at one minute intervals		
Treated Water Fluoride	Once per day, recorded as Average, Maximum, Minimum	Continuous at 15 minute intervals		
Log inactivation of <i>Giardia</i>	Once per day, recorded as Average, Maximum, Minimum	Continuous, calculated as moving hourly average		
Log inactivation of <i>Cryptosporidium</i>	Once per day, recorded as Average, Maximum, Minimum	Continuous, calculated as moving hourly average		
Log inactivation of Virus	Once per day, recorded as Average, Maximum, Minimum	Continuous, calculated as moving hourly average		

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**TERMS AND CONDITIONS ATTACHED TO APPROVAL**

PARAMETERS	FREQUENCY	SAMPLE TYPE	DESIGNATED SAMPLING LOCATION	REPORTING MANNER/ FREQUENCY
<b>MATRIX: TREATED WATER (DISTRIBUTION SYSTEM)</b>				
Treated water Total Chlorine Residual	Once per week	Grab	DISTRIBUTION SYSTEM: FIELD RESERVOIR, ROSSLYN 1  DISTRIBUTION SYSTEM: FIELD RESERVOIR, ROSSLYN 2  DISTRIBUTION SYSTEM: FIELD RESERVOIR, LONDONDERRY  DISTRIBUTION SYSTEM: FIELD RESERVOIR, PAPASCHASE 1  DISTRIBUTION SYSTEM: FIELD RESERVOIR, PAPASCHASE 2  DISTRIBUTION SYSTEM: FIELD RESERVOIR, THORNCLIFF	Electronic reporting in accordance with 2.1.3 and 6.1.2 and Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and
Treated Water Turbidity	Once per week	Grab	DISTRIBUTION SYSTEM: FIELD RESERVOIR, MILLWOODS  DISTRIBUTION SYSTEM: FIELD RESERVOIR, ORMSBY  DISTRIBUTION SYSTEM: FIELD RESERVOIR, CLAREVIEW  DISTRIBUTION SYSTEM: FIELD RESERVOIR, CASTLEDOWNS  DISTRIBUTION SYSTEM: FIELD RESERVOIR, KASKITAYO  DISTRIBUTION SYSTEM: FIELD RESERVOIR, NORTH JASPER PLACE	Written monthly reporting in accordance with 6.1.8 and 6.1.9 and Written annual report in accordance with 6.1.12 and 6.1.14

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**TERMS AND CONDITIONS ATTACHED TO APPROVAL**

PARAMETERS	FREQUENCY	SAMPLE TYPE	DESIGNATED SAMPLING LOCATION	REPORTING MANNER/ FREQUENCY
Treated water Total Chlorine Residual	Five per week	Grab	DISTRIBUTION: RANDOM LOCATIONS	Electronic reporting in accordance with 2.1.3 and 6.1.2 and Electronic monthly reporting in accordance with 6.1.10 and 6.1.11 and Written monthly reporting in accordance with 6.1.8 and 6.1.9 and Written annual report in accordance with 6.1.12 and 6.1.14
Treated Water Turbidity	Five per week	Grab		
Bacteriological Analysis	155 per month	Grab	DISTRIBUTION: BACTERIOLOGICAL	

6.1.3 If any of the sampling exceeds operational goals listed in TABLE 6-2, the approval holder shall:

- (a) report to the Director at 1-780-422-4505; and
- (b) report corrective actions taken.

**TABLE 6-2: OPERATIONAL GOALS AND NOTIFICATION - WATERWORKS SYSTEM**

PARAMETERS	DESIGNATED SAMPLING LOCATION	NOTIFICATION LIMIT
Particle Counts (>2 µm)	Combined filter effluent (Rossdale Plant 1&2, E.L. Smith Plant 4)	≥ 50 particles counts/ml for a period greater than 15 minutes. (Notify once per day)
Unscheduled bypass longer than 4 hours	Plant Bypass (Rossdale Plant 1&2, E.L. Smith Plant 4)	Bypass over 4 hours
Major System Failure listed in Section 4.1.1	Rossdale Plant 1&2, E.L. Smith Plant 4	Major equipment failure
pH Plant Bypass water	Rossdale Plant 1&2, E.L. Smith Plant 4	≥ 10 for discharge greater than 1 hour duration
Chlorine gas leak released to exterior	Rossdale Plant 1&2, E.L. Smith Plant 4	≥ 0.5 ppm

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

- 6.1.4 In the event of the failure of continuous monitoring equipment for a period greater than one-hour, the approval holder shall:
- (a) take grab samples at the following frequency:
    - (i) every hour for chlorine and turbidity;
    - (ii) every 2 hours for fluoride and particle counts;
    - (iii) every 4 hours for pH;
  - (b) if failure of continuous monitoring continues for more than 1 day, the approval holder shall:
    - (i) report the continuous monitoring equipment failure to the Director at 1-780-422-4505; and
    - (ii) submit a time-line for equipment repair.
- 6.1.5 In addition to complying with 6.1.1, the approval holder shall collect a minimum of two samples of *raw water* and minimum of two samples of *treated water* each year according to the following:
- (a) the raw water shall be collected prior to addition of any chemical;
  - (b) the treated water shall be collected prior to the distribution system;
  - (c) one grab sample of raw water shall be collected during the winter months of January, February, March;
  - (d) one grab sample of treated water shall be collected during the winter months of January, February, March;
  - (e) one grab sample of raw water shall be collected during the summer months of July, August, September;
  - (f) one grab sample of treated water shall be collected during the summer months of July, August, September;

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

- (g) the samples shall be analyzed for:
    - (i) all parameters listed in the CDWQG having a maximum acceptable concentration or an interim maximum acceptable concentration with the exception of:
      - (A) Aldicarb, Bendiocarb, Carbofuran, Chlordane, DDT and its Metabolites, Heptachlor, Heptachlorepoide, Temephos, Nitrilotriacetic acid (NTA), Diclofop-methyl, Dinoseb, Diquat, Paraquat, Temephos and 2,4,5-T;
    - (ii) caffeine; and
    - (iii) any other parameters as may be required in writing by the Director;
  - (h) the analyses shall be conducted by a CAEAL accredited laboratory with documented quality assurance and quality control programs, including participation in inter-laboratory studies.
- 6.1.6 In addition to complying with 6.1.1, the approval holder shall collect a minimum of once each month; one raw sample prior to addition of any chemical and one treated sample from the treated water entering the distribution system at each water treatment plant and conduct chemical analysis on those samples for:
- (a) Ammonia, Arsenic, Barium, Boron, Cadmium, Chloride, Chromium, Copper, Cyanide, Fluoride, Hardness, Iron, Lead, Manganese, Mercury, Nitrate, Nitrite, Selenium, Sodium, Sulphate, Sulphide, Total Dissolved Solids, Trihalomethanes, Uranium, Zinc; and
  - (b) any other parameters as may be required in writing by the Director.
- 6.1.7 In addition to complying with 6.1.1, the approval holder shall collect a minimum of once per month; one treated water sample taken in the areas within the distribution system having the longest observed detention times and conduct chemical analysis on those samples for Trihalomethanes.
- 6.1.8 The approval holder shall compile a Monthly Waterworks Report which shall include the following:
- (a) the requirements of TABLE 4-1;
  - (b) the requirements of TABLE 6-1;
  - (c) list of notifications required in TABLE 6-2;

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- (d) name of the supervising operator and all certified operators responsible for the operation of the waterworks system;
  - (e) on a daily basis, the name, concentration and dosage of each chemical that is added to the water treatment process;
  - (f) on a daily basis, the total weight of fluoride that is added to the water treatment process;
  - (g) the result of the chemical analysis of water as required in 6.1.6 and 6.1.7;
  - (h) a description of any incident which required reporting as per 2.1.1;
  - (i) a summary of any operational problems;
  - (j) summary of distribution system maintenance (mainbreak repairs and flushing programs);
  - (k) summary of critical monitoring equipment calibration for online equipment listed in Table 5-1; and
  - (l) any other information as requested in writing by the Director.
- 6.1.9 The approval holder shall submit one copy of the Monthly Waterworks Report outlined in 6.1.8 to the Director on or before the last day of the month following the month in which the information on which the report is based was collected.
- 6.1.10 When notified in writing by the Director, the approval holder shall:
- (a) report monthly by electronic reporting the following information:
    - (i) the requirements of TABLE 6-1; and
    - (ii) the result of the chemical analysis of water as required in 6.1.6 and 6.1.7.
- 6.1.11 The approval holder shall submit the information required in 6.1.10 on or before the end of the month following the month in which the information on which the report is based was collected.
- 6.1.12 The approval holder shall compile an Annual Waterworks Report which shall include the following:
- (a) the monthly average of each parameter monitored, as outlined in TABLE 4-1 and TABLE 6-1;

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- (b) maximum and minimum daily value of each parameter monitored, as outlined in TABLE 4-1 and TABLE 6-1, for each month;
  - (c) summary of notifications as outlined in TABLE 6-2, for each month;
  - (d) the result of the chemical analyses of water as required in 6.1.5;
  - (e) name of the supervising operator and all certified operators responsible for the operation of the waterworks system;
  - (f) any incident which required reporting as per 2.1.1;
  - (g) a summary of any operational problems; and
  - (h) any other information as requested in writing by the Director.
- 6.1.13 If the approval holder monitors for any substances or parameters which are the subject of operational limits as set out in this approval more frequently than is required and using procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the Annual Waterworks Report.
- 6.1.14 The approval holder shall submit one copy of the Annual Waterworks Report as outlined in 6.1.12 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.
- 6.1.15 When notified in writing by the Director, the approval holder shall:
- (a) report annually by electronic reporting the following information:
    - (i) the result of the chemical analysis of water as required in 6.1.5.
- 6.1.16 The approval holder shall submit the information required in 6.1.15 on or before February 28 of the year following the year in which the information on which the report is based was collected

**PART 7: RECLAMATION & DECOMMISSIONING**

**SECTION 7.1: GENERAL**

- 7.1.1 Within six months of the water treatment plant permanently ceasing operation, the approval holder shall:
- (a) submit a decommissioning and land reclamation plan to the Director, and

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- (b) not commence reclamation or decommissioning until the approval holder has received written authorization from the Director.

DATED March 30, 2004

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DESIGNATED DIRECTOR UNDER THE ACT  
PARK POWELL