



**CODE OF PRACTICE FOR
A WATERWORKS SYSTEM
CONSISTING SOLELY OF A
WATER DISTRIBUTION SYSTEM**

Effective October 1, 2008

*made under the
Environmental Protection and Enhancement Act,
RSA 2000, c.E-12
and the
Environmental Protection and Enhancement (Miscellaneous)
Regulation, AR 118/93*

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ALBERTA ENVIRONMENT

**CODE OF PRACTICE FOR A WATERWORKS SYSTEM
CONSISTING SOLELY OF A WATER DISTRIBUTION SYSTEM**
[made under the *Environmental Protection and Enhancement Act*,
RSA 2000, c.E-12, and the *Environmental Protection and
Enhancement (Miscellaneous) Regulation*, AR 118/93]

**Effective October 1, 2008, this document replaces the September 2003
document**

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PART 1: DEFINITIONS

- 1.1 All definitions in the Act and the regulations under the Act apply except where expressly defined in this Code of Practice.
- 1.2 In this Code of Practice:
- (a) “Act” means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended from time to time;
 - (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) “chlorine residual” means free chlorine, or combined chlorine or total chlorine;
 - (e) “continuous” means flow measurement or sample analysis through in-line equipment that creates flow measurements or frequent, discrete sample analysis output;
 - (f) “design capacity” means a production capacity for which the waterworks system was designed, as stated in the engineering drawings and specifications for the waterworks system, provided pursuant to section 3.1.3;
 - (g) “four seasons” is comprised of “spring” - March to May, “summer” – June to August, “fall” – September to November, “winter” – December to February;
 - (h) “GCDWQ” means the *Guidelines for Canadian Drinking Water Quality*, published by Health Canada, as amended or replaced from time to time;

- (i) “grab”, when referring to a sample, means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;
- (j) “ISO / IEC” means the International Organization for Standardization / the International Electrotechnical Commission;
- (k) “MAC” means the Maximum Acceptable Concentration, specified in the GCDWQ for a particular parameter;
- (l) “professional engineer” means a professional engineer or registered professional technologist (engineering) under the *Engineering, Geological and Geophysical Professions Act*;
- (m) “regulations” means the regulations under the Act;
- (n) “running annual average” means the arithmetic average of the concentrations of all the most recent samples taken covering a 365 day period;
- (o) “Standards and Guidelines Document” means the Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, published by the Department, as amended or replaced from time to time;
- (p) “this Code of Practice” means the Code of Practice for a Waterworks System Consisting Solely of a Water Distribution System, published by the Department, as amended or replaced from time to time; and
- (q) “weekday” means Monday, Tuesday, Wednesday, Thursday, or Friday.

PART 2: GENERAL PROVISIONS

Section 2.1: General

- 2.1.1 Any person who constructs, operates or reclaims a waterworks system that consists solely of a water distribution system shall do so in accordance with this Code of Practice.
- 2.1.2 Any conflict between the registration application and the terms and conditions of this Code of Practice shall be resolved in favour of this Code of Practice.
- 2.1.3 The terms and conditions of this Code of Practice do not affect any rights or obligations created under any other authorization issued by the Department.
- 2.1.4 The terms and conditions of this Code of Practice are severable. If any term or condition of this Code of Practice or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and to the remainder of this Code of Practice shall not be affected by that invalidity.
- 2.1.5 If the registration holder monitors for any substances or parameters which are the subject of limits in this Code of Practice more frequently than is required, using procedures authorized in this Code of Practice, then the registration holder shall provide the results of such monitoring as an addendum to the next reports required by this Code of Practice.

Section 2.2: Analytical Requirements

- 2.2.1 With respect to any monitoring required pursuant to this Code of Practice, all samples shall be:
 - (a) collected;
 - (b) preserved;
 - (c) stored;
 - (d) handled; and

- (e) analyzed 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.

2.2.2 Any analysis of a sample required pursuant to this Code of Practice, shall be done only in an approved laboratory, or in accordance with the Department's alternate program.

2.2.3 Any analysis of a sample of treated water for bacteriological quality required pursuant to this Code of Practice shall be conducted only by the Alberta Provincial Laboratory for Public Health, unless otherwise specified in writing by the Director.

PART 3: ADMINISTRATION, DESIGN AND CONSTRUCTION REQUIREMENTS

Operations Program

3.1.1 If the waterworks system was not previously registered, no person shall apply for a registration unless that person has prepared or caused to be prepared a written operations program governing the operation of the waterworks system.

3.1.1.1 A registration holder shall have a written operations program governing the operation of the waterworks system completed by the latter of:

- (a) the date of application for a registration, or
- (b) the date specified in a notice issued pursuant to S.8.1(4) of the *Environmental Protection and Enhancement (Miscellaneous) Regulation*, AR 118/93.

3.1.2 The operations program in section 3.1.1.1 shall contain, at a minimum, all of the information in Schedule 1.

- 3.1.3 In addition to the information required in the Act and the regulations, an application for a registration shall contain, at a minimum, the following information:
- (a) written confirmation that the person applying for the registration has prepared, or caused to be prepared an operations program;
 - (b) engineering drawings signed and stamped by a professional engineer, for the proposed waterworks system or proposed changes to the waterworks system, including the design capacity of the proposed waterworks system or proposed change;
 - (c) a statement, signed and stamped by a professional engineer, indicating whether the design of the project complies with all the design requirements of:
 - (i) this Code of Practice, and
 - (ii) the regulations under the Act; and
 - (d) in cases in which a design requirement in section 3.1.3 (c) is not met, a statement, signed and stamped by a professional engineer, identifying and justifying the deviation.
- 3.1.4 No person shall install any water treatment equipment that was not included in the registration application unless the Director has been advised in writing in advance of the intention to install and operate that water treatment equipment.

PART 4: OPERATIONAL REQUIREMENTS

- 4.1.1 The waterworks system shall be
- (a) operated; and
 - (b) maintained
- at all times within its design capacity.
- 4.1.2 Repealed
- 4.1.2.1 The registration holder shall maintain positive pressure at all points throughout the distribution system where water is being supplied.
- 4.1.3 Repealed

Certified Operator

- 4.1.4 At all times, the operation of the waterworks system shall be performed by, or under the direction of, a person who holds a valid certificate of qualification at the applicable level as set out in Table 4-1.
- 4.1.5 At all times, the number of certified operators available to perform or direct the operation of the waterworks system shall meet or exceed the applicable numbers in Table 4-1.

TABLE 4-1: MINIMUM WATERWORKS SYSTEM OPERATOR CERTIFICATE OF QUALIFICATION REQUIREMENTS

Population Served by Waterworks System	Minimum Number and Minimum Qualifications of Water Distribution Certified Operator(s)
< 500	One operator with a Small Water Systems Certificate
500 - 1500	One operator with a Level I Water Distribution (WD) Certificate
1,501 – 15, 000	One operator with a Level II Water Distribution (WD) Certificate
15, 001 – 50,000	One operator with a Level III Water Distribution (WD) Certificate, and One operator with a Level II Water Distribution (WD) Certificate
50,001 and over	One operator with a Level IV Water Distribution (WD) Certificate, and Two operators with a Level III Water Distribution (WD) Certificate, and One operator with a Level II Water Distribution (WD) Certificate

PART 5: LIMITS AND MONITORING REQUIREMENTS

- 5.1.1 The quality of potable water distributed by the waterworks system shall comply with the limits in Table 5-1
 - (a) at all locations specified in Table 5-2; and
 - (b) at all times water is being supplied at that location.

TABLE 5-1: POTABLE WATER QUALITY LIMITS

Parameter	Limit (Maximum unless otherwise specified)
Bacteriological	Applicable MAC
Chlorine residual	Greater than or equal to 0.1 mg/L, based on at least 75% of the grab samples taken on a particular day, and Greater than or equal to 0.1 mg/L in 99% of continuous readings.
Lead and Trihalomethanes	Applicable MAC, based on the running annual average.

- 5.1.2 Repealed
- 5.1.3 If a sample does not meet one or more of the bacteriological quality limits in Table 5-1, in addition to any reporting or other requirements pursuant to the Act, the regulations, or this Code of Practice, the registration holder shall carry out the corrective actions set out in the *Communication and Action Protocol for Failed Bacteriological Results Including Other Potential Failures in Drinking Water for Waterworks Systems Authorized under the Environmental Protection and Enhancement Act*, entered into by Alberta Environment, the Alberta Provincial Laboratory for Public Health, and Alberta Health and Wellness, as amended or replaced from time to time.
 - 5.1.3.1 If the first sample result of a chlorine residual sampling event pursuant to 5.1.4 does not meet the residual chlorine limit in Table 5-1, the registration holder shall:
 - (a) flush the distribution line in the vicinity of the sample;
 - (b) resample and analyze the chlorine residual at the same location; and
 - (c) resample and analyze the chlorine residual from a service connection upstream and a service connection downstream from the location where the first sample failed.

5.1.3.2 In the event that the chlorine residual in any of the sample results in sections 5.1.3.1(b) and 5.1.3.1(c) is less than 0.1 mg/L, the registration holder shall immediately report the incident to the Director by telephone at 1-780-422-4505.

Potable Water Monitoring

5.1.4 The potable water in the waterworks system shall be monitored in accordance with Table 5-2, unless otherwise specified in writing by the Director.

TABLE 5-2: POTABLE WATER MONITORING LOCATION AND FREQUENCY

Parameter	Sample type	Monitoring Location	Minimum Monitoring Frequency and Minimum Number of Samples
Bacteriological	Grab	At random location(s) within the water distribution system	For systems serving a population over 1500 or more than 10 kilometres of water distribution system: The frequency and number of samples as set out in the GCDWQ, without any reduction, or For systems serving a population of 1500 or less and having 10 kilometres or less of water distribution system: One sample per 500 population, per month.
Chlorine residual	(a) and either (b) or (c) (a) Grab; and	(a) and either (b) or (c) (a) At the same location as the bacteriological quality sample is collected; and	(a) and either (b) or (c) (a) One sample, taken at the same time as the bacteriological quality sample is collected; and

TABLE 5-2 (continued)

Parameter	Sample type	Monitoring Location	Minimum Monitoring Frequency and Minimum Number of Samples
Chlorine residual (continued)	(b) Grab	(b) At a random location(s) within the water distribution system; or	(b) For systems serving a population of more than 500, or more than 3 kilometres of distribution system: One sample per day, five days per week, including the samples taken at the same time as the bacteriological samples; if a statutory holiday falls on a weekday within that week, the sample is not required on that day, and the frequency may be reduced by one day for each statutory holiday; or For systems serving a population of 500 or less and having 3 kilometres or less of water distribution system: Three samples per week, including the samples taken at the same time as the bacteriological samples, with a minimum of 24 hours between samples; or
	(c) Continuous	(c) At an fixed point in the water distribution system authorized by the Director	(c) One sample, every five minutes, recording all results and reporting the minimum value for each day
Lead	Grab	At a random location(s) within the water distribution system	One sample per year

- 5.1.5 In the event of a repair within the water distribution system, in addition to the monitoring required in section 5.1.4, the registration holder shall monitor for
- (a) bacteriological quality; and
 - (b) chlorine residual
- by grab sample, in the following manner:
- (i) immediately after each repair; and
 - (ii) at a sampling point closest to the location of the repair.

Trihalomethanes

5.1.6 Repealed

- 5.1.6.1 In addition to any other monitoring requirements pursuant to this Code of Practice, the Act or the regulations, trihalomethanes shall be monitored in the waterworks system in the following manner:
- (a) for systems where the registration holder adds chlorine to the water and:
 - (i) the trihalomethane concentrations in any sample in the water entering, or in, the water distribution system are greater than the applicable MAC, or no analytical results are available:
 - (A) one grab sample in each of the four seasons, each year;
 - (B) all samples shall be taken at the location furthest from the point the water enters the water distribution system; and
 - (C) there shall be a minimum of two months between samples; or
 - (ii) the trihalomethane concentrations in all samples in the previous sampling event covering a one year period in the water entering, or in, the water distribution system are less than the applicable MAC:
 - (A) one grab sample in each of the four seasons, every three years;
 - (B) all samples shall be taken at the location furthest from the point the water enters the water distribution system; and
 - (C) there shall be a minimum of two months between samples; or

- (b) for systems where the registration holder does not add chlorine to the water and:
 - (i) the trihalomethane concentrations in any sample in the water entering, or in, the water distribution system are greater than the applicable MAC, or no analytical results are available:
 - (A) one grab sample in each of the summer and winter periods, each year;
 - (B) all samples shall be taken at the location furthest from the point the water enters the water distribution system; or
 - (ii) the trihalomethane concentrations in all samples in the previous sampling event covering a one year period in the water entering, or in, the water distribution system are less than the applicable MAC:
 - (A) one grab sample in each of the summer and winter periods, every three years;
 - (B) all samples shall be taken at the location furthest from the point the water enters the water distribution system.

5.1.7 to 5.1.9 Repealed

Additional Measurements

5.1.10 Repealed

5.1.10.1 The total water volume entering the distribution system shall be measured as required to fulfil the requirements of 5.1.11 and where no treatment chemical is added, the total water volume entering the distribution system shall be computed a minimum of once per month.

5.1.11 If any treatment chemical is added to the waterworks system, the dosage of each chemical added shall:

- (a) be calculated in milligrams of chemical per litre of water (mg/L) by measuring the amount of chemical added in a period not exceeding 7 days divided by the total volume of water to which the chemical was added; and

- (b) not exceed the dosage specified as Maximum Use in *Standard 60*, published by the National Sanitation Foundation and the American National Standards Institute (NSF/ANSI), as amended or replaced from time to time, unless otherwise authorized in writing by the Director.

PART 6: RECLAMATION REQUIREMENTS

- 6.1.1 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.
- 6.1.2 Within six months after the waterworks system, or a portion of the waterworks system, permanently ceases operation, the registration holder shall submit a reclamation plan to the Director for the portion of the system that is no longer in operation.
- 6.1.3 No person shall commence reclamation of the waterworks system until that person has received written authorization from the Director for the reclamation.
- 6.1.4 Any person conducting reclamation of the waterworks system shall comply with the reclamation plan, as authorized in writing by the Director.

PART 7: REPORTING REQUIREMENTS

Contravention Reporting

- 7.1.1 In addition to any other reporting required pursuant to this Code of Practice, the Act, or the regulations, the registration holder shall immediately report to the Director any contravention of this Code of Practice, 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.

7.1.2 In addition to any other reporting required pursuant to this Code of Practice, the Act, or the regulations, the registration holder shall immediately report to the Director by a method under section 7.1.1, any structural or equipment malfunction in the waterworks system that may affect the quality or supply of potable water.

7.1.3 In addition to the immediate report in section 7.1.1, the registration 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.

7.1.4 The report required under section 7.1.3 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 registration issued under the Act for the waterworks system, and the name of the person who held the registration at the time the contravention occurred;

- (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 Code of Practice, as a result of the incident; and
- (n) any other information required by the Director in writing.

Monthly Reporting

7.1.5 The registration holder shall compile and retain monthly reports.

7.1.6 The monthly report in section 7.1.5 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 Code of Practice during the month;
- (c) the locations of all sampling performed during the month in accordance with this Code of Practice;
- (d) the name and manufacturer of all treatment chemicals added during the month, and each manufacturer as listed in the *Standard 60*, published by the American National Standards Institute and the National Sanitation Foundation, (ANSI/NSF) as amended or replaced from time to time; and
- (e) the results of all required measurements conducted during the month in accordance with this Code of Practice.

Annual Reporting

7.1.7 In addition to any other reporting required under the Act, the regulations, and this Code of Practice, the registration holder shall compile 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.

- 7.1.7.1 Until a notice under section 7.1.9 is issued by the Director, the registration holder shall submit to the Director the annual report in section 7.1.7, by February 28 of the year following the calendar year in which the information on which the report is based was collected.
- 7.1.8 The annual report in section 7.1.7 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) a summary of the number, results, and sampling dates of the bacteriological samples analyzed for each month;
 - (c) the results of any other compliance monitoring done during the year pursuant to this Code of Practice that was not included in any monthly report; and
 - (d) a description of any problems experienced and corrective actions taken at the waterworks system during the year with respect to environmental matters.

Electronic Reporting

- 7.1.9 The Director may, by notice in writing, require the registration holder to submit periodic reports:
- (a) in an electronic format; and
 - (b) at a different frequency than specified in sections 7.1.5 and 7.1.7.1 of this Code of Practice.
- 7.1.10 The registration holder who receives a notice as specified in section 7.1.9 shall comply with the notice.

PART 8: RECORD KEEPING REQUIREMENTS

- 8.1.1 The registration 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, and
 - (C) treatment chemical dosages;required under this Code of Practice;
 - (iii) all monthly reports required under this Code of Practice; and
 - (iv) records of action taken by the registration holder to correct contraventions of potable water quality limits (MAC), 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.
- 8.1.2 The registration holder shall maintain the following records for the life of the waterworks system:
- (a) the operations program;
 - (b) copies of all:
 - (i) applications submitted to the Department for a registration regarding the waterworks system, and correspondence related to the registration,
 - (ii) engineering drawings and specifications,
 - (iii) project reports,
 - (iv) construction documents,
 - (v) record drawings,
 - (vi) all reports of inspections conducted by the Department,
 - (vii) all correspondence 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) all registrations issued under the Act for the waterworks system,
 - (ix) all annual reports, and

- (x) all reports prepared pursuant to sections 7.1.3 and 7.1.4; and
- (c) all analytical results required pursuant to this Code of Practice, excluding daily monitoring.

8.1.3 The results and records in sections 8.1.1(b) and 8.1.2(c) 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 a routine water distribution system sample, repeat sample, 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.

8.1.4 The registration holder shall immediately provide any records, reports or data required to be created under this Code of Practice to the Director or an inspector, upon request.

PART 9: CODE OF PRACTICE ADMINISTRATION

9.1.1 This Code of Practice will be reviewed as changes in technological or other standards warrant.

Schedule 1
Operations Program Contents

- 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, and
 - (iii) pumping equipment; and
 - (e) the schedule and procedures for cleaning and flushing of the entire water distribution system, including potable water storage reservoirs;
 - (f) written agreement between the approval or registration holder that operates the waterworks system supplying water to this waterworks system and the registration holder for this system, including:
 - (i) the minimum chlorine concentration the approval or registration holder supplying the water is obligated to deliver,
 - (ii) a list of all waterworks systems that receive water from this waterworks system, including contact names, telephone numbers, and fax numbers,
 - (iii) a list of all service connections off of any potable water transmission main included in this waterworks system, including contact names, telephone numbers, and fax numbers,
 - (iv) the communication and notification protocol or process that is in place between the approval or registration holder supplying the water to this system and the registration holder for this waterworks system.

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; and
 - (e) laboratory data quality assurance information.

3. **Emergency Response Plan, which shall, at a minimum, include steps to be taken in the event of the following:**
 - (a) bacteriological results exceeding the prescribed limits;
 - (b) low chlorine residual;
 - (c) equipment breakdown;
 - (d) flood and other natural disasters;
 - (e) water distribution system pipeline break and repair, and the return of the pipeline to service;
 - (f) power failure;
 - (g) the waterworks system becoming inoperable, including steps in providing an alternate potable water supply; and
 - (h) list of contacts – Alberta Environment, Alberta Health, Regional Health Authorities, Fire Department, Disaster Coordinator, and other agencies.

4. **Date of last update**