Village of Lytton

Drinking Water Quality Monitoring Program

ANNUAL REPORT FOR 2014

VILLAGE OF LYTTON
P.O. BOX 100, 380 MAIN ST.
LYTTON, B.C. V0K 1Z0
Phone 250-455-2355 Fax 250-455-2142
Email: hotspot@lytton.ca

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1. INTRODUCTION

Under the terms of the BC Drinking Water Protection Act & Regulation the Village is required to provide an annual report to users of the system that gives an overview of the water system, a summary of water test results, and a review of maintenance and improvements made to the system. This report has been submitted to Interior Health and is posted on the Village of Lytton website www.lytton.ca

2. LYTTON WATER DISTRIBUTION SYSTEM

The Village of Lytton has 143 residential and 33 commercial water connections (176 total) serving the residents of Lytton. Water is also distributed to, two Lytton First Nation Reserves bordering the village of Lytton;

- IR-17 with 17 connections
- IR-18 with 33 connections

In total there are 226 water service connections, serving a population of approximately 346. The population distribution is: 203 for the village, 61 for IR-17 and 82 for IR-18.

The primary drinking water source is Lytton Creek. The intake is located approximately 1km upslope and east of the Trans-Canada Highway. The village also has an emergency backup source, Well 1 located at Alonzo Way within the village. It has not been used as a backup source since August 2009.

Currently, water from the Lytton Creek source has only one form of treatment, which is 12% liquid sodium hypochlorite (bleach/chlorine). After treatment the chlorine level becomes diluted. Bacterial samples are taken from four Zones in the distribution system on a weekly basis and then sent to CARO Analytical Services in Kelowna for bacterial analysis. Zone 1 is located at 951 - IR-18 at the Lytton First Nation Band Office, or 938, - IR-18. Zone 2 is located at the Village of Lytton Office. Zone 3 is a private residence located at 430 Ponderosa Heights. Zone 4 is a private residence located at 370, IR-17. The chlorine level is also monitored at the wastewater treatment plant. Turbidity (NTU) levels are also monitored at the dam intake, at the chlorine treatment facility and the 5 areas in the distribution system.

(Note: 265 & 345 refers to elevation above sea level in meters, as well as where the reservoirs are located as pressure zones on a map. Lytton's elevation is listed as 195 meters).

The Village maintains approximately 6.5 km of water mains of various type and size, as well as 3 reservoirs throughout the water distribution system. The old reservoir capacity is 445 cubic metres of water. The new 345 reservoir has 480 cubic metres and the new 265 reservoir has 360 cubic metres of water. The combined total of all 3 reservoirs is 1285 Cubic Metres of water storage (282,659 Imperial Gallons).

Water from Well 1 is not treated at this time before it enters into the distribution system. As a requirement to operate the well, the Village must advise the Interior Health's Drinking Water Officer of the request to turn on the well. A Water Quality Advisory is then issued to all residents on the Village of Lytton water distribution system because there is no well head protection program in place.

Figures 1 & 2 show the layout of the Village's water distribution system. The new 345 reservoir is located above the old reservoir shown in Figure 1. And the new 265 reservoir that is located north of IR-17 shown in Figure 2. (New updated mapping was not available to show upgrades. They are marked in by hand to show new reservoir locations).

Water is disinfected inside the chlorine building located 1200 feet below the dam intake on Lytton Creek prior to entering the 345 upper reservoirs. Twelve percent (12%) liquid chlorine is injected directly into the flow stream piping as the reservoir is filling the mix/settlement chamber. Most fine sediment (organic or mineral) is captured by a 6" fine mesh screen and the remainder in the settlement chamber of the old 345 reservoir. Water then overflows into the main reservoirs, which in turn gives a better mix of water and chlorine to allow for contact time for disinfection. The Interior Health Authority requires a minimum of 0.2 mg/L of free chlorine residual remaining in the water distribution system at the far ends of the water lines. To achieve this, the chlorine levels in the upper reservoirs are monitored and adjusted to maintain a reading of 1.0 mg/L of free chlorine. The amount of chlorine dosage is controlled by a flow meter that is attached to a prominent chlorine pump. The chlorine level is adjusted manually dependant on turbidity and free chlorine readings taken from the 3 Zones in the distribution system with portable hand held chlorine & turbidity meter readers once a day in the mornings except Wednesday when testing and samples are taken in all 5 Zones. Turbidity, intake pressure, reservoir depth and free chlorine readings are monitored with a basic SCADA (Supervisory Control and Data Acquisition) system. The instrumentation for monitoring turbidity, intake pressure and reservoir depth is located at the chlorination building. Free chlorine residual is monitored at the wastewater treatment plant at the south end of town. The data is linked together through a basic computer program and available to operators over the internet through a secure log-in procedure. Operators use this as a tool to monitor what's happening without being onsite. The limitation is the operator currently cannot make any adjustments remotely, as with some more updated SCADA systems.

Water from the upper reservoirs at 345; distribute water to IR-17, Ponderosa Heights and Loring Way to the High School through to Kent Road. It also supplies water to the new 265 reservoir north of IR-17. The 265 reservoir in turn supplies water to all residents below the Trans-Canada Highway, which include downtown and IR-18.

FIGURE 1

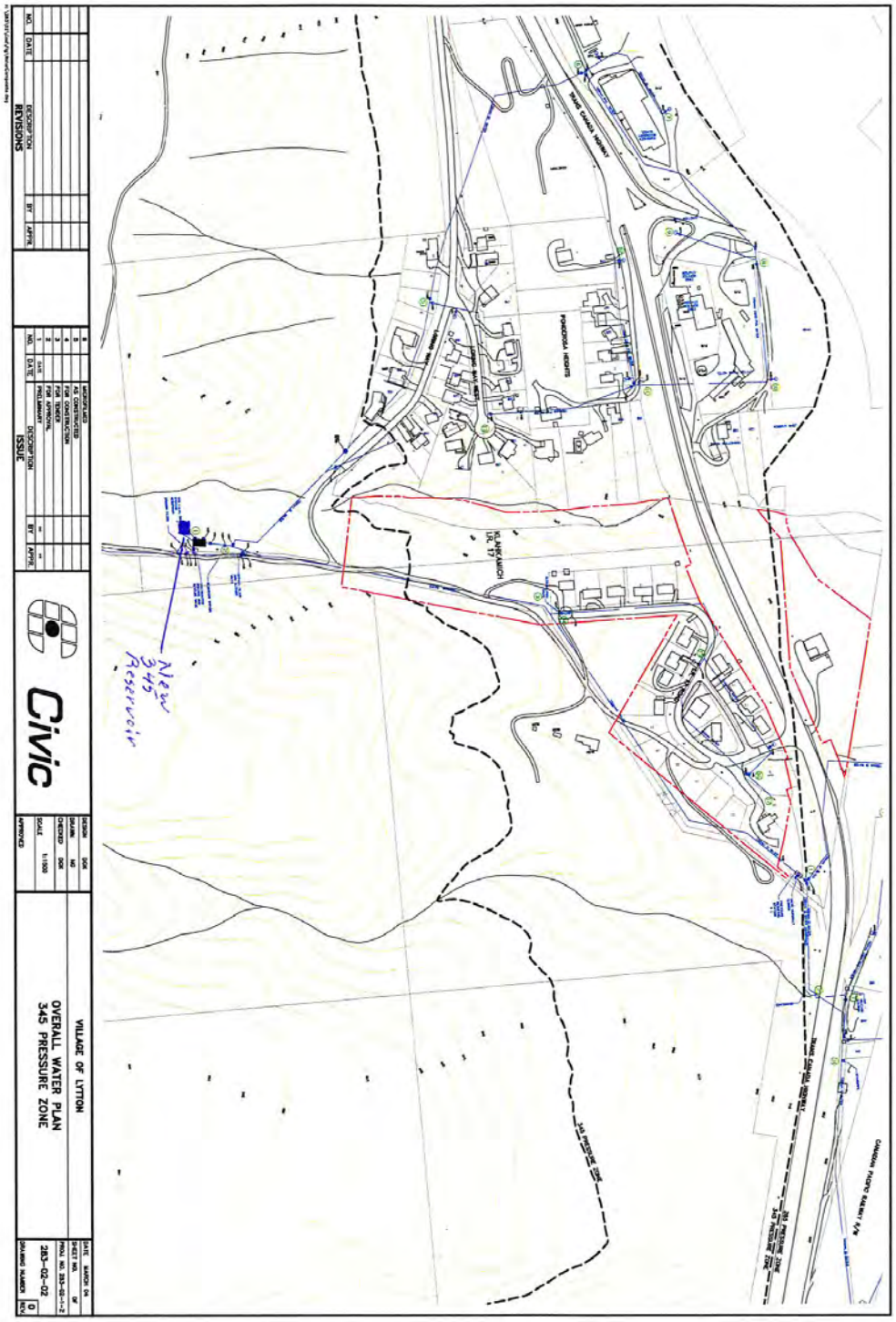
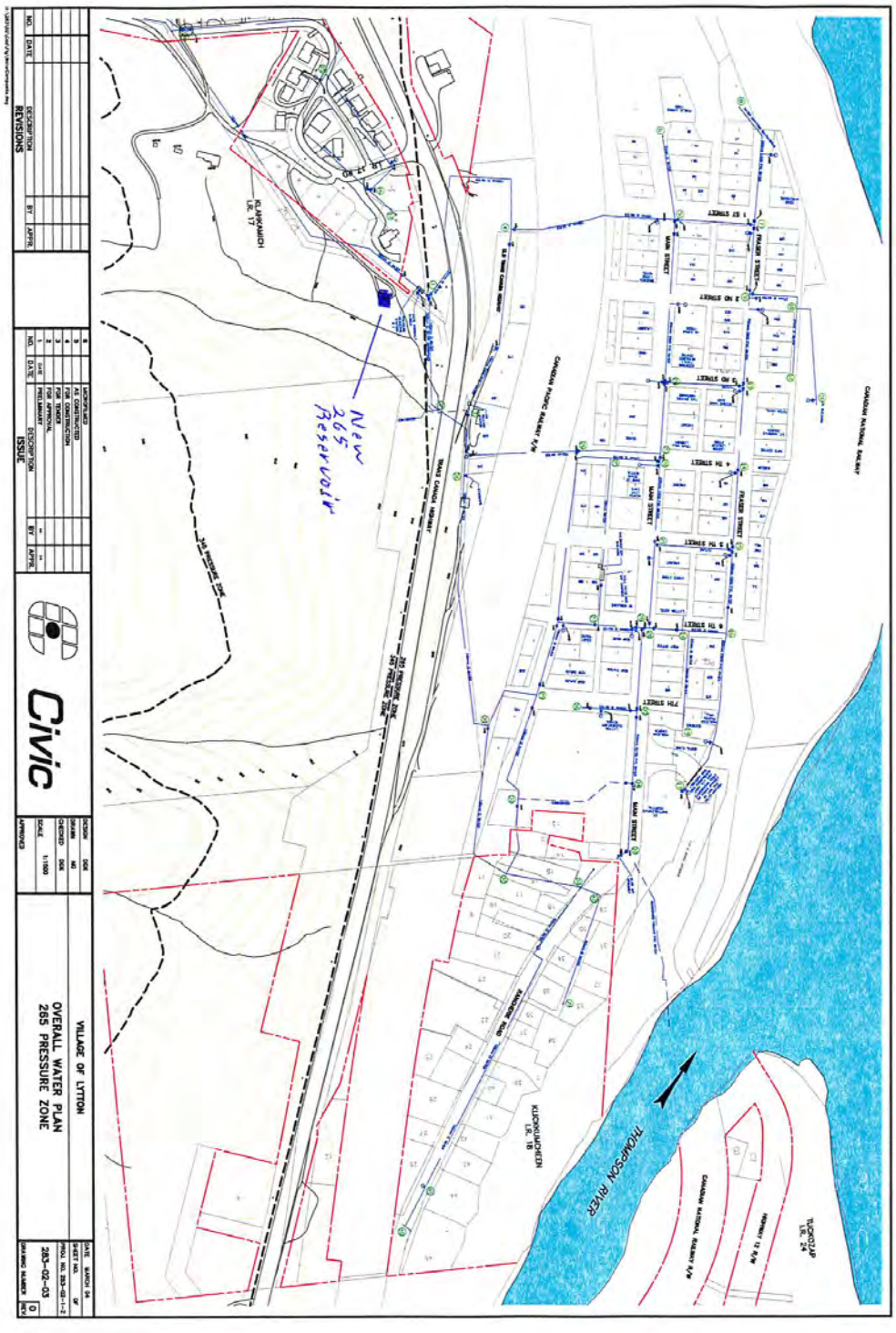

New 345 Reservoir
VILLAGE OF LYTTON
OVERALL WATER PLAN
345 PRESSURE ZONE
Civic
REVISIONS
ISSUE

FIGURE 2


New 265 Reservoir
THOMPSON RIVER
VILLAGE OF LYTTON
OVERALL WATER PLAN
265 PRESSURE ZONE
Civic

3. SYSTEM CLASSIFICATION

3.1 Environmental Operators Certification Program re-classified the Village of Lytton Water System as a Class II Water System on May 17, 2012. Certificate No. 1126. (Certificate attached, Figure 3)

FIGURE 3

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Facility Classification

This is to certify that

Village of Lytton Water System

has been classified by the Environmental Operators Certification Program in accordance with the guidelines established with the Association of Boards of Certification as a

Class II System

Dated at Burnaby, BC on May 17, 2012

Secretary - Certification Board

President - Certification Board

Facility No. 1126

This certificate must hold the EOCP embossed seal.
Member of the Association of Boards of Certification
A society incorporated under the Society Act, S.B.C. S-28724

eocp

4. OPERATOR CERTIFICATION/TRAINING

4.1 Village of Lytton Operators have the following certification:

- 3 certified in Small Water Systems
- 1 certified in Water Distribution Level 1
- 0 certified in Cross Connection Control

Operators attended a correspondence *Applied Operation Math* course presented by Thompson Rivers University, Water Treatment Technology

Lead Hand attended a *Small Water and Small Wastewater System Operator* course at MTS Training in Vernon, B. C.

Pat Maw is registered for Water Distribution Level 2 in Sept. 2015.

5. WATER QUALITY RESULTS

5.1 Chlorine/Turbidity

Chlorine and Turbidity levels are obtained daily from 3 areas in the distribution system. The sample areas were reduced from 5 to 3 in November of 2012, as a request from Council to reduce time and cost of O/M for water. A request to the Villages' Drinking Water Officer, Rob Fleming at IHA to change the sampling procedures was presented and accepted. The agreement to the reduction of sampling would entail the following procedure(s). Zone 1 and 3 would be sampled on odd days. Zone 2 and 4 would be sampled on even days. The 5th area would be sampled every day at the Wastewater Treatment Plant (WWTP) as daily maintenance is required to be conducted there as well. However, once a week bacterial samples taken from Zones 1 to 4 require chlorine and turbidity data readings to be included with the sample when shipped to the lab. Sampling of the 5 areas would also be required should the villages' water system be on a Boil Water Notice (BWN). Holiday samples would also be limited to water treatment/reservoir(s), Village Office and wastewater treatment plant.

Generally when free chlorine residuals drop below the minimum acceptable requirements of 0.2mg/L or the turbidity levels rise above allowable limits of 1.0 NTU or more the Interior Health Drinking Water Officer is informed of the situation. After consultation, the appropriate notification is distributed to all users on the villages' water distribution system, informing them of a potential hazard. This is done via mail out, fax and notices posted at the Village Office, Canada Post Office and village bulletin boards. This procedure would also be followed if there were other incidents of possible contamination of the villages' water system. When the event has ended, a Rescind notice is issued to residents.

Maintaining chlorine residuals in the distribution system is a challenge when Spring Freshet (Spring Runoff) or heavy rain events occur. Also having only one point of chlorine treatment at the beginning of the line (at the upper reservoirs), along with having some dead end water lines makes it somewhat difficult to maintain an adequate free chlorine residual throughout the distribution system. The chlorine residual will be higher for those living closer to the upper reservoirs, in order to maintain the minimum acceptable free chlorine residual required for disinfection at the far ends in the distribution system. In 2014 there were 6 days of high turbidity readings greater than 1 NTU. Some of the days were not a sustained event which did not require public notification. Sloughing or wild game crossing Lytton Creek may have been the cause by disturbing the natural flow in the creek itself. The appropriate notification procedures were followed as required to inform residents of water quality.

5.2 Bacteriological

No issues to report.

6. 2012 UPGRADES & FUTURE PLANS

6.1 2012 to 2014Upgrades/Changes

There were no new upgrades or major changes in 2014
Works on the two new reservoirs, new pipe and altitude valve at the 265 reservoir were completed in November 2012. Mix chamber of the original 345 reservoir was cleaned of on average 4 inches of sediment on November 7th, 2014. Leaves, sand, rocks and other debris were cleaned out from behind the Gabian Baskets on November 17th and debris was cleaned from behind the Dam at the intake April 25th and 28th, 2014.

6.2 Cross Connection Control Program (CCCP)

On November 26, 2012, council adopted a new bylaw 664, 2012. This is part of the Village of Lytton's Drinking Water Quality Improvement Program – 2012 Conditions of Permit. This is item 4 listed in the conditions on Permit to Operate and is under Section 8 of the Drinking Water Protection Act. As such, there is a legal requirement to comply with all terms and conditions of the permit. Budget expenses have been allocated to move forward with assessments on village infrastructure assets first and then with commercial properties in the future. This is to ensure that Lytton's potable water is protected from backflow incidents and prevent possible contamination.

6.3 Future Planning

The Village of Lytton continues to move toward upgrading its infrastructure. The priority is to continue with design plans for a slow sand filtration system on the Lytton Creek water source to improve water quality. The Village will continue to seek funding to upgrade and make repairs to the following:

1. Lytton Creek gabion baskets / flow direction for bank stabilization and to improve settlement and reduce solids reaching intake screen.

2. Repair to the intake dam.

3. Hydro upgrade to upper reservoir / treatment location.

4. SCADA upgrade to allow for additional and remote monitoring of system operations.

5. Addition of secondary treatment (UV, ozone, etc.) to system as add-on to slow sand filtration structure.

6. Reconfiguration of water mains/valves adjacent to new treatment and upper reservoirs.

7. Ultrasonic water level sensors for reservoirs.

8. Water main looping at locations in distribution system where flows/residual levels would benefit.

9. Installation of automated blow offs on dead-end water mains where looping is not practical.

7. OPINION OF THE PROGRAM

The Drinking Water Quality Monitoring program generates a much needed report card for all water purveyors. The program is effective because it links compliance of conditions to the operating permit. The Village of Lytton has struggled with major changes in staff turnover from administration to public works. Also with elected officials over the past few years, while trying to meet timelines in accordance with the operating permit. We are now getting closer to the end of the list of conditions and imagine that if all purveyors comply with their operating permits, drinking water quality should continue to improve and remain safe for consumers. The Village of Lytton is responsible for providing safe drinking water and notifying the public and health authorities about water quality problems.

8. APPENDICES

Appendix A Chlorine & Bacterial Sampling Results
Appendix B Chemical Summary
Appendix C Flow/Use
Appendix D Reservoir Storage Capacity
Appendix E Certificates

Appendix A – Chlorine & Bacterial Sampling Results

The Village of Lytton did not undertake independent sampling in 2014.

Appendix B – Chemical Summary

In 2014 the Village of Lytton took 199 bacteriological samples with no positive results for Total Coliform or E.coli.

No Comprehensive samples were collected from the source waters (Lytton Creek or Alonzo Well) in 2014.

Two Public Notification events occurred in 2014 due to a decline in water quality in Lytton Creek from turbidity:

1. Water Quality Advisory issued May 15, 2014 and Rescinded November 18, 2014 – Lasted 188 Days
2. Water Quality Advisory issued December 15 and Rescinded January 6, 2015 – Lasted 23 Days including the last 17 days of the calendar year.

Summary is Two Water Quality Advisories in the calendar year of 2014 for a total of 205 Days.

Appendix C – Flow/Use

YEAR TO DATE SUMMARY AS OF DECEMBER 31, 2014 IN IMPERIAL GALLONS

2012		2013		2014	
Jan.	4402000	Jan.	4346000	Jan.	4437000
Feb.	3804000	Feb.	4143000	Feb.	4249000
Mar.	3774000	Mar.	4618000	Mar.	5095000
Apr.	4108000	Apr.	5303000	Apr.	4358000
May	7082000	May	8158000	May	7672000
Jun.	8099000	Jun.	8116000	Jun.	8778000
Jul.	9520000	Jul.	9678000	Jul.	9615000
Aug.	8739000	Aug.	8994000	Aug.	8841000
Sep.	6575000	Sep.	6669000	Sep.	8823000
Oct.	5093000	Oct.	5131000	Oct.	5900000
Nov.	4557000	Nov.	4655000	Nov.	4814000
Dec.	4265000	Dec.	4637000	Dec.	4251000
YEARLY	**70018000**	**YEARLY**	**74020000**	**YEARLY**	**76836000**

Appendix D - Reservoir Storage Capacity

LYTTON RESERVOIRS CAPACITY

345 OLD RESERVOIR	445	cu.m.=	445000	Litres	97886	Imp.Gal.
345 NEW RESERVOIR	480	cu.m.=	480000	Litres	105585	Imp.Gal.
265 NEW RESERVOIR 2 CELLS x 180cu.m.	360	cu.m.=	360000	Litres	79188	Imp.Gal.
TOTAL VOLUME	1285	cu.m.=	1285000	Litres	282659	Imp.Gal.

Appendix E - Certificates

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Certificate of Qualification

This is to certify that

Patrick M. Maw

by examination has qualified as a

Water Distribution System Operator

Level I

Dated at Burnaby, BC on May 20, 2011

Certification No. 6677

Secretary - Certification Board

President - Certification Board

eocp

Member of the Association of Boards of Certification

This certificate must hold the EOCP embossed seal and shall be in full force when affixed with a current renewal seal

A society incorporated under the Society Act, S.B.C. S-28724

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Certificate of Qualification

This is to certify that:

Patrick M. Maw

By Examination Has Qualified As A

Small Water System Operator

and certifies that he/she has met the established qualifications and has the ability to efficiently operate and maintain a specified maximum size and type of water facility designated as follows:

Small Water System

Secretary - Certification Board

Chairman - Certification Board

September 9 2008

Certificate No: 6677

eocp

Members of Association of Boards of Certification

This certificate shall be in full force and effect when accompanied by an annual renewal seal

This certificate must hold the EOCP seal

A Society Incorporated under the Society Act, S.B.C. S-28724

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Certificate of Qualification

This is to certify that:

Tom F. McPhail

By Examination Has Qualified As A

Small Water System Operator

and certifies that he/she has met the established qualifications and has the ability to efficiently operate and maintain a specified maximum size and type of water facility designated as follows:

Small Water System

Secretary - Certification Board

President - Certification Board

March 16, 2010

Certificate No: 7216

eocp

Members of Association of Boards of Certification

This certificate shall be in full force and effect when accompanied by an annual renewal seal

This certificate must hold the EOCP seal

A Society Incorporated under the Society Act, S.B.C. S-28724

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Certificate of Qualification

This is to certify that

Owen S. Collings

by examination has qualified as a

Small Wastewater System Operator - Mechanical

Dated at Burnaby, BC on September 26, 2014

Certification No. 8743

Secretary - Certification Board

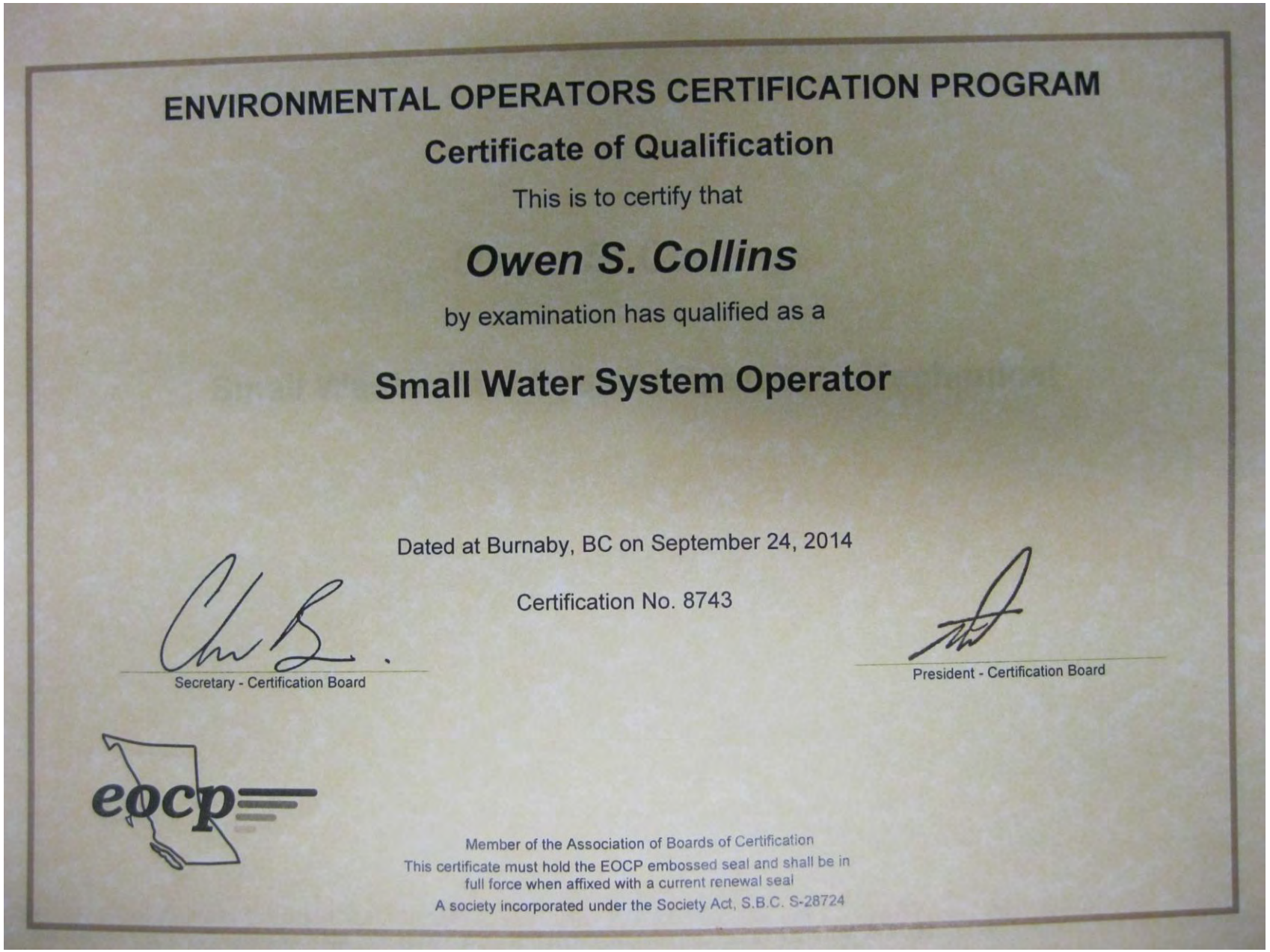
President - Certification Board

eocp

Member of the Association of Boards of Certification

This certificate must hold the EOCP embossed seal and shall be in full force when affixed with a current renewal seal

A society incorporated under the Society Act, S.B.C. S-28724



ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Certificate of Qualification

This is to certify that

Owen S. Collins

by examination has qualified as a

Small Water System Operator

Dated at Burnaby, BC on September 24, 2014

Certification No. 8743

Secretary - Certification Board

President - Certification Board

eocp

Member of the Association of Boards of Certification
This certificate must hold the EOCP embossed seal and shall be in full force when affixed with a current renewal seal
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