Osoyoos

Canada's warmest welcome ®*

2017

WATER

Submitted by:

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Town of Osoyoos
Annual Water Report

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1.0 Introduction to the Town Water Systems

The Town of Osoyoos operates water systems within its municipal boundary (Municipal Water System) and within Electoral area (Water District Irrigation Systems) on the west side of Osoyoos Lake both north and south of the boundary. The service areas of both systems are illustrated on the following map (Page 3) . The municipal system provides service to the majority of residential, commercial and industrial lands within the municipal boundaries and is supplied by wells. The Water District system is primarily an irrigation water supply system using two intakes in Osoyoos Lake.

2.0 Municipal Water System

2.1 Water Supply Wells

A total of six wells supply groundwater to the Town's municipal water system. The water supply wells range in capacity from 18 L/sec (295 USgpm) to 75 L/sec (1200 USgpm) and are listed following.

Well No. 1	Jack Shaw Gardens
Well No. 3	Maple Drive
Well No. 4	Cottonwood Park
Well No. 5	Cottonwood Park
Well No. 6	Wye in Lacey Point Area
Well No. 8	Kingfisher Drive at 83rd Street



Wells No. 4 and No. 5

In addition, the Town has a drilled and capped a well (designated No. 7) north of Well No. 6 in the Lacey Point area. The Town performed a test of Well No. 7 in 2017 to determine if it was viable as a production well. The results of that test indicated that Well 7 could be converted into a production well without adversely affecting water production from Well No. 6. In 2018 the Town of Osoyoos will plan for the development of Well No. 7 into a full production well complete with chlorine disinfection capabilities. The locations of the water supply wells are shown on the following map (Page 4) of the municipal water system.

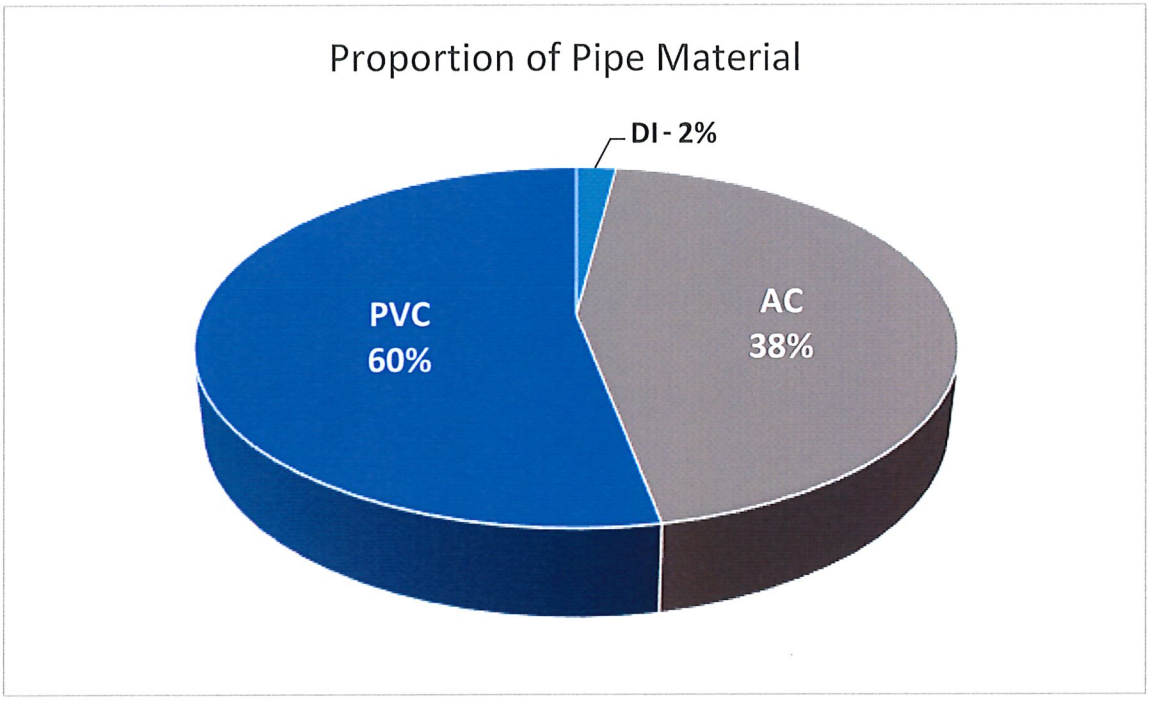


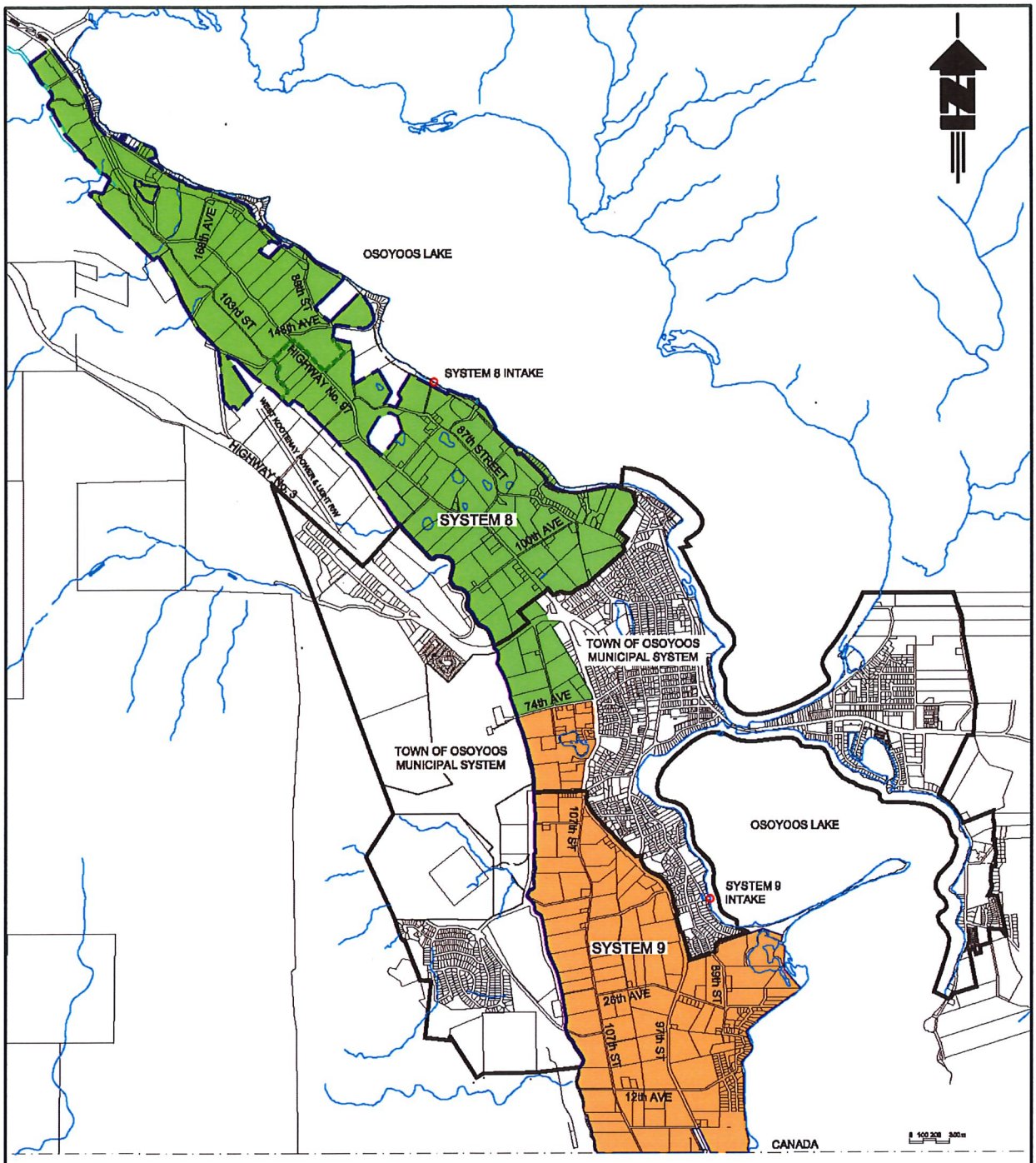
Well No. 1

2.2 Water Distribution System

The municipal water distribution system comprises about 57.0 km of water main ranging in size from 50 mm (2") to 400mm (16"). Pipe materials comprise:

- 22.2 km of asbestos cement pipe installed in the period up to 1980
- 0.9 km of ductile iron pipe installed in the 1980's
- 34.2 km of PVC pipe installed since 1980





Town of Osoyoos Water System Service Areas

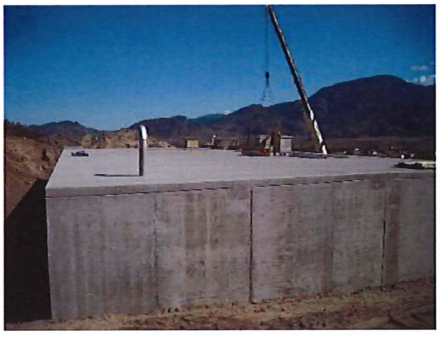


Town of Osoyoos Municipal Water System

2.3 Reservoirs and Pressure Zones

The municipal water system comprises a total of 3 pressure zones each at successively higher elevations servicing areas on the west side of Osoyoos Lake. The pressures zones and reservoirs in each pressure zone are listed following.

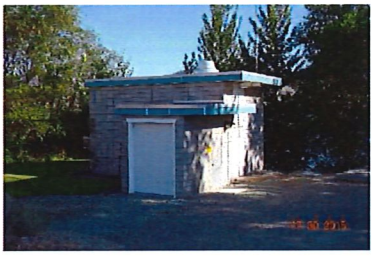
- 340 Zone – 2 Reservoirs having a combined capacity of 3,910,000 L (1,000,000 USgal). The service areas include all areas of the Town east of Highway 97 including East Osoyoos.
- Industrial Park Reservoir having a capacity of 1,000,000 L (260,000 USgal). The service area includes the Industrial Park, secondary school and Desert Park.
- Dividend Ridge Reservoir having a capacity of 1,140,000 L (300,000 USgal). The service area includes the Dividend Ridge neighbourhood and the golf course clubhouse.



340 North Reservoir under Construction 2011

3.0 Osoyoos Water District (Irrigation Systems 8 and 9)

Up to 1990, irrigation systems 8 and 9 were owned and operated by the South Okanagan Lands Irrigation District (SOLID). In 1990, the Province dissolved SOLID and transferred ownership of irrigation systems 8 and 9 to the Town. The Osoyoos Water District provides irrigation water to about 600 hectares (1,500 acres) of agricultural land and about 500 domestic connections.



Irrigation System 8 Intake/Pumphouse

3.1 Osoyoos Lake Intakes

During the irrigation season, mid-April to mid-October annually, irrigation systems 8 and 9 are supplied from separate intakes in Osoyoos Lake. The System 8 intake is located south of the BC Tree Fruits Packinghouse while the System 9 intake is on Acadia Court. At both intakes, water disinfection is provided by chlorination.



Irrigation System 9 Intake/Pumphouse

Outside of the irrigation system (mid-October to mid-April annually) the lake intakes are not operated except for emergency conditions. In this off-season period, water to domestic connections in the service area of Systems 8 and 9 are supplied groundwater from the Town's municipal system.

3.2 Water Distribution Systems

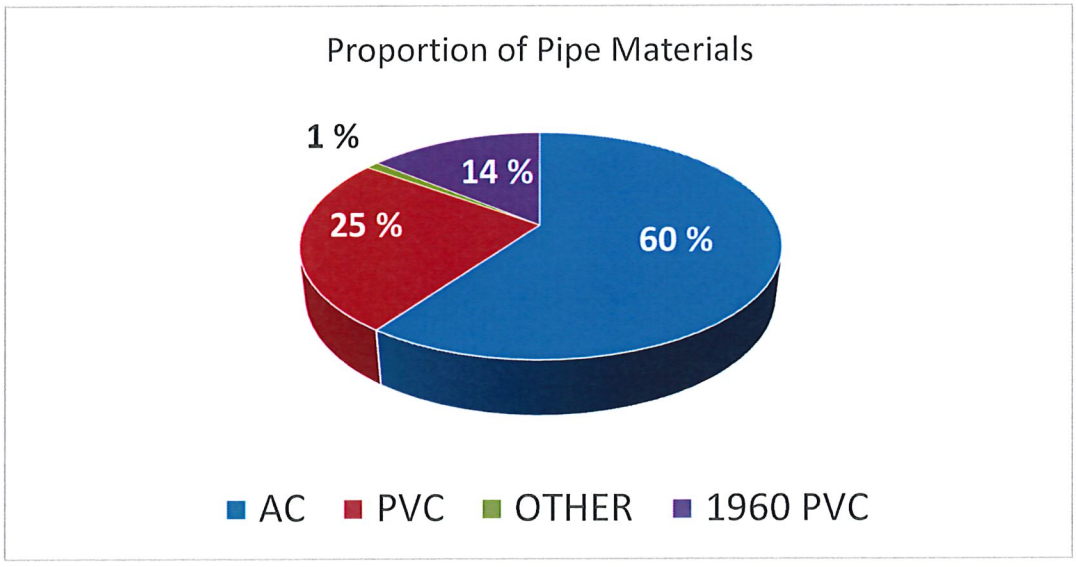
The System 8 and 9 water distribution systems were constructed in the 1960's when flood irrigation supplied from the irrigation canal was replaced with pressurized systems. Starting in September of 2016 the Town of Osoyoos began expanding its municpal water distribution system into Irrigation System No. 8 (north of Town). The pipe material and sizes installed are as follows:

- 4.4 km of 250mm diameter PVC pipe
- 2.2 km of 200mm diameter PVC pipe
- 1.3 km of 150mm diameter PVC pipe

Water distribution systems for Systems 8 and 9 comprise:

	System 8	System 9	Total
Small dia. PVC installed 1960's	3,875 m	1,953 m	5,828 m
Asbestos Cement	12,130 m	12,197 m	24,327 m
Ductile Iron and Concrete Cylinder	280 m	321 m	601 m
PVC installed since 1991	8,222 m	1,769 m	9,991 m
Totals	24,507 m	16,240 m	40,747 m

The total distribution main length is 40.7 km of which 24.3 km, 60%, is asbestos cement pipe.



3.3 Reservoir

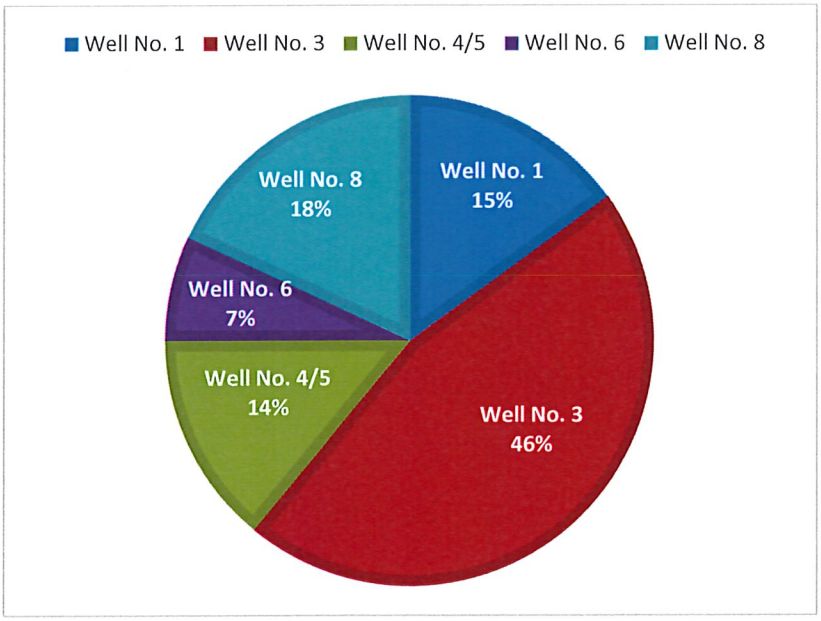
During the irrigation season, Systems 8 and 9 are operated / controlled by system pressure. Pressure monitors in each pumphouse start and stop supply pumps as required to maintain a set supply pressure. In the winter months, mid-October to mid-April annually, a reservoir located on the Osoyoos West Bench south and adjacent to the municipal 340 reservoir is put into service. This reservoir has an operating capacity of 482,000 L (130,000 USgal). In the winter months, water is supplied by Well No. 6 which is controlled by reservoir level.

4.0 Water Consumption

4.1 Municipal System

Consumption in the service area of the municipal water system in 2017 totaled 2,384 ML. Water supplied by each well is tabulated following.

Well No. 1	335 ML	(15%)
Well No. 3	1,094 ML	(46%)
Well No. 4/5	340 ML	(14%)
Well No. 6	176 ML	(7%)
Well No. 8	439 ML	(18%)
Total	2,384 ML	



Dissolved manganese concentration at or above the aesthetic objective as specified in the Canadian Drinking Water Quality Standards is present in water supplied by Wells 4, 5, 6 and 8. To the greatest extent practical the Town maximizes the use of Wells 1 and 3 to minimize the amount of dissolved manganese in the water system.

The maximum day water consumption was recorded in the five day period from July 27th to 31st when the water consumption averaged 13.9 ML/day. 2017 annual and maximum day water consumption are compared to historical data on *Figure 1*. From *Figure 1*,

- total annual water consumption in 2017 was about 10 ML (0.4%) higher than 2016. This increase could be attributed to an increased demand on the domestic water system as a result of the Rural Water Twinning Program. Beginnning in late 2016 the Town of Osoyoos expanded the domestic water system to over 130 residences in Irrigation System No. 8.

- the maximum day demand in 2017 occurred on July 30 (14.1 ML) was 1.4 ML (10%) higher than the maximum day demand in 2016 (Maximum Day Demand = 12.7 ML on August 19, 2016).
- over the last 15 years, the total annual water consumption has remained relatively constant in the range of 2,100 to 2,500 ML/year. In this period the permanent population of the Town as measured by the census increased by 16% from 4,295 in 2001 to 5,050 in 2016. This population growth may also have added to increase domestic water consumption.

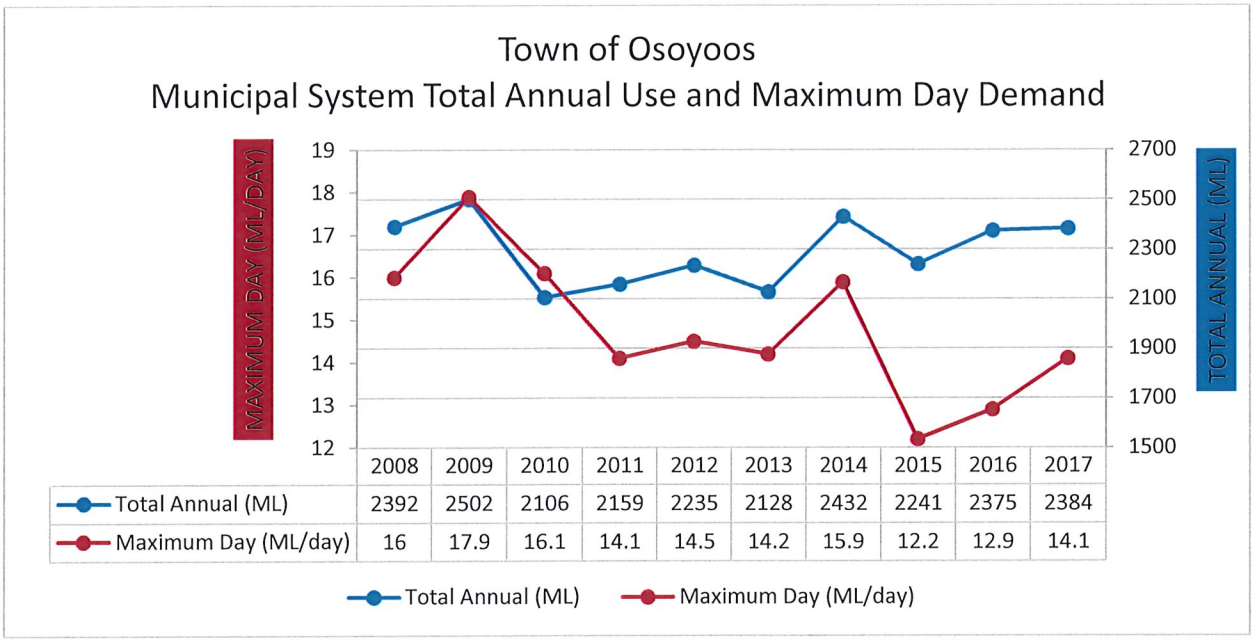


Figure 1

4.2 Irrigation Systems 8 and 9

Water consumption in 2017 in the service area of Irrigation Systems 8 and 9 is summarized as follows.

Irrigation Season

System 8		3,874 ML
System 9		2,829 ML
	Total	6,703 ML

Winter

Well No. 6	107 ML

The consumption of 6,810 ML in the irrigation season equates to an average application rate of 1.11 m based on 611 ha (1500 ac) of irrigation in the service area.

Figure 2 illustrates Irrigation Systems 8 and 9 consumption in the period 2008 to 2017. As compared to 2016, irrigation system consumption decreased by 565 ML (8.2%) in 2017. This decrease in consumption may be attributed to the installation of domestic water service in Irrigation System No. 8. Over 130 residences had a separate domestic water service installed in 2017 that previously would have been dependent upon irrigation water for home use.

Irrigation Season Water Consumption
Irrigation Systems 8 and 9

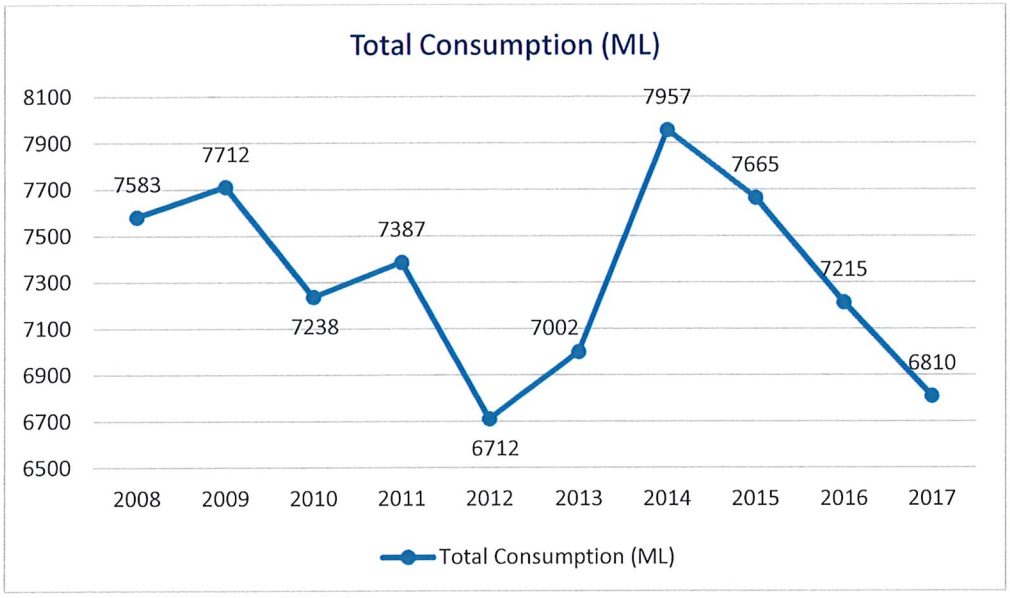


Figure 2

5.0 Water Sampling and Testing

5.1 Bacteriological Testing

The Town undertakes sampling for bacteriological analysis of both the irrigation and municipal systems. Sampling is undertaken weekly with the sampling locations listed following.

Municipal System Sampling Locations:

5202 Lombardy Lane	10124 Meadowlark Drive
8707 78th Avenue	8703 74th Avenue
8606 87th Avenue	6006 89th Street
4220 Lobelia Drive	5705 Lombardy Lane
6066 89th Street	8405 87th Street
4010 Lobelia Drive	11715 Locosta Lane

Irrigation System Sampling Locations:

System 9

- 5001 – 107th Street
- 10021 – 42nd Avenue

System 8

- 9103 – 100th Avenue
- 9707 – 87th Street

Bacteriological sampling results for 2017 are tabulated in Appendix A and summarized as follows.

Municipal System

- Total No. of Samples – 104
- No. of Positive Results for E.Coli – 0
- No. of Positive Results for Total Coliform – 11

Irrigation Systems

- Total No. of Samples – 104
- No. of Positive Results for E.Coli – 1
- No. of Positive Results for Total Coliform – 0

When positive results for EColi or Total Coliforms are discovered the Town's procedure is to thoroughly flush the area where the results where obtained, chlorine is introduced into the system at Wells No.1 & 3 and then the area is re-sampled the next week. This has always resulted in the elimination of positive E.Coli and Total Coliform test results.

The bacteriological results for the two systems reflect that the water supplied from the municipal system is not chlorinated and water supplied from the irrigation system is chlorinated.

5.2 Water District Trihalomethane Testing

Trihalomethanes are a group of organic chemicals that are formed by the reaction of chlorine and organic materials which may be present in the water. Organic materials typically include algae, colour, and other natural organic matter. Trihalomethanes are described as disinfection by-products with the concentration being dependent on a number of factors including concentration of organic materials (usually measured as total organic carbon), chlorine dose and retention time in the distribution system.

Irrigation Systems 8 and 9 are sampled annually for trihalomethane. The sample results for 2017 are presented as follows.

Sample Date/Location	August 08 System 9 – 10021 42nd	August 08 System 8 – 10408 89th	CDWQ Standard
Total Trihalomethanes	0.065 mg/L	0.052 mg/L	0.1 mg/L MAC
Bromodichloromethane	0.003	0.004	n/a
Bromoform	<0.001	<0.001	n/a
Chloroform	0.048	0.061	n/a
Dibromochloromethane	<0.001	<0.001	n/a

The sample results are well within the maximum acceptable standard as set in the Canadian Drinking Water Quality Standards.

5.3 Osoyoos Water District Boil Water Advisory

Treatment provided for water supplied from the Systems 8 and 9 water intakes in Osoyoos Lake does not comply with IHA drinking water quality standards. The principal deficiencies are:

- inadequate chlorine contact time to services in proximity to the two pumphouses
- there is no treatment, typically filtration, for the removal or inactivation of parasites, most common being giardia and cryptosporidium

In accordance with instructions from IHA, the Town annually issues a boil water advisory for residents within the service area of Irrigation Systems 8 and 9. The boil water advisory was issued in April 2017 at the start of the irrigation season and rescinded in October 2017 at the end of the irrigation system.

Residents in the service area of irrigation systems 8 and 9 are advised of the Boil Water Advisory by notices published in the Osoyoos Times and posted on the Town's website. Notices are published in the Osoyoos Times:

- end of March or first week of April – Advanced Notice
- weekly in April
- monthly – May, June, July, August and September
- end of October or first week of November – Notice of Boil Water Advisory rescindment

5.4 Municipal System Full Spectrum Analysis

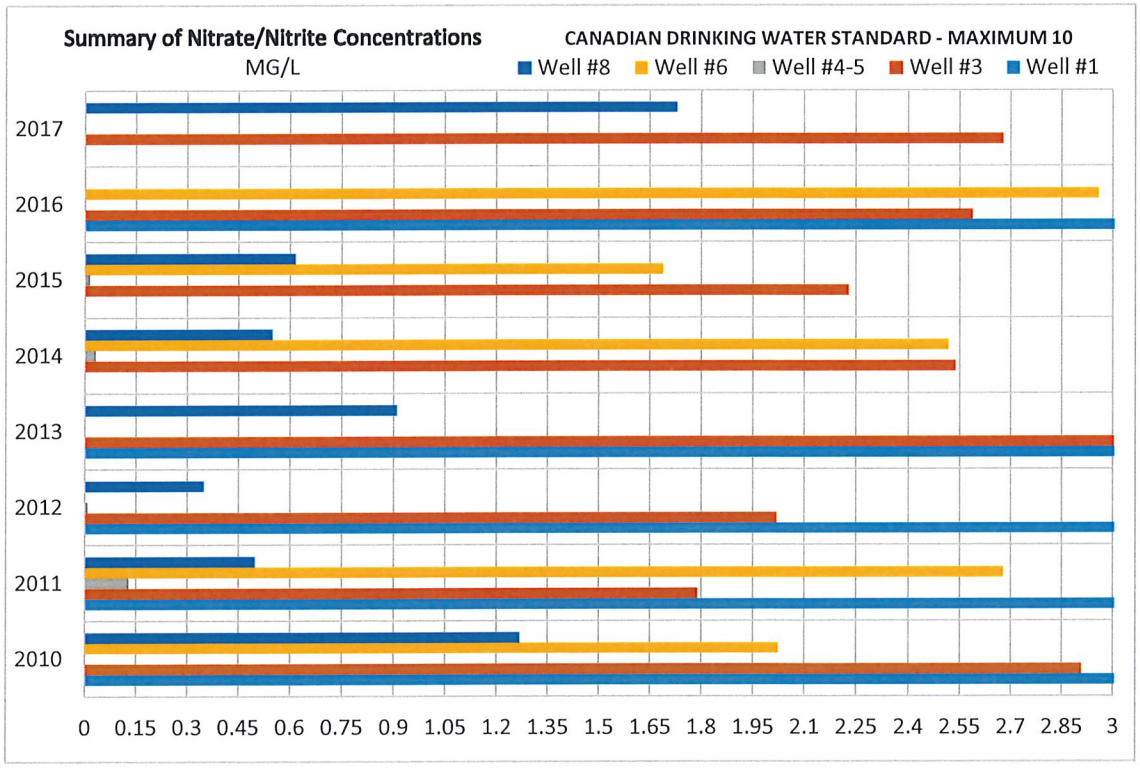
In addition to bacteriological testing as described in 5.1, the Town samples annually one of the six water supply wells for a full spectrum analysis. In 2017, Well No. 1 was sampled for a full spectrum analysis. Full spectrum water quality testing for the water supply Well No. 1 is contained in Appendix B.

5.5 Groundwater Source Nitrate Monitoring

High nitrate concentrations in groundwater is experienced throughout the South Okanagan area. High nitrate concentrations are attributable to fertilizer use by the agricultural industry. The Town monitors nitrate concentration in all six of the water supply wells used as water sources. Nitrate data for each well for the period 2008 to 2017 is contained in Appendix C. The data is summarized following.

	Nitrate-Nitrite
Canadian Drinking Water Quality Maximum Acceptable Concentration	10 mg/L
Ten Year Averages (2007 to 2016)	
Well No. 1	4.89 mg/L
Well No. 3	2.89 mg/L
Wells No. 4 & 5	0.56 mg/L
Well No. 6	2.43 mg/L
Well No. 8	0.70 mg/L

Wells No. 1 and 3 have higher nitrate-nitrite concentrations than the Town's other four wells. The following graph illustrates the nitrate-nitrite concentrations in Wells No. 1 and No. 3.



Note: Data from Wells 4, 5 is not available from 2013 + 2016. Data from Well 6 is not available for 2013 and from Well 8 for 2016. Future reports will attempt to capture nitrate-nitrite data from all 6 Town wells.

5.6 Water Quality Complaints and Operational Incidents

The majority of water quality related complaints relate to "black and dark brown sediments" in the water. These complaints are primarily from residents in the service area of the municipal water and are attributable to manganese in water supplied from Wells 4, 5, 6 and 8. The Town has an ongoing flushing program focusing on dead end mains with the objective of removing manganese related sediments/precipitates from the distribution system. The Town attempts to preferentially use Wells 1 and 3 which do not have manganese to thereby minimize the amount of manganese in water supplied in the municipal system.

Note: The Town of Osoyoos has plans to development and construct a Water Treatment facility to assist with the removal of manganese from Town well water. The proposed schedule for this project is as follows: Detailed Design in 2019 and with Facility Construction in 2020-21

The most significant operational incident in 2017 occurred in Irrigation System 8 with the installation of the new domestic water services. Residents in this area were used to operating there lawn irrigation sytems off of the irrigation water system which typically functions at pressures of 80 – 90 psi. The new domestic (Well) water system operates at approximately 60 psi therefore citizens noticed some operational issues with lawn sprinkler systems.

6.0 Operation and Maintenance

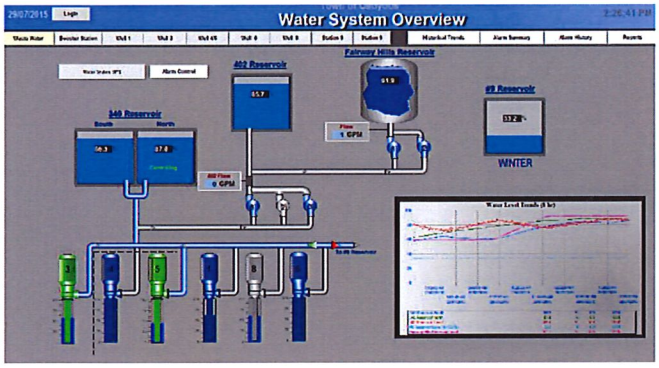
6.1 Routine Maintenance Program

- Water Supply Wells
  - daily check of all wells to confirm satisfactory operation. Operating parameters including discharge pressure, flow, running time, and service voltage are logged.
  - pumped lubrication and packing are checked and adjusted as required.
  - annual water sampling.
- Irrigation Systems 8 and 9 Intake/Pumphouse
  - daily check during the irrigation season. Operating parameters are logged.
  - pump lubrication and packing are checked and adjusted as required.
  - chlorine residual and turbidity analyser calibration is checked monthly.
  - chlorine cylinders are removed when empty and replaced with full cylinder.
  - pumphouse maintenance on an as required basis.
- Booster Stations 402 and Fairway Hills
  - daily inspections to check securing and record operating parameters.
  - pump lubrication and packing are checked and adjusted as required.
- Reservoirs
  - all reservoirs are inspected daily, excluding weekends, to confirm site and reservoir structure security.

- Distribution System
  - water mains flushing is carried out on a weekly basis during the summer months and monthly during the remainder of the year.
  - fire hydrants are inspected and maintained twice per year.
  - pressure reducing stations are inspected monthly.
  - watermain valves are exercised annually.

6.2 SCADA (Supervisory Control and Data Acquisition) System

A SCADA computer control and monitoring system is used by the Town to control major components of the water systems. System capabilities include:



- Water Supply Wells and Intakes
  - pump operational status
  - flow, elapsed running times
  - well levels where applicable
  - chlorine residuals at irrigation intake
- Booster Stations
  - pump operational status
  - flow and elapsed running time
- Reservoirs
  - reservoir level
  - pump start/stop and alarm set points
  - intruder alarms

The Town has an ongoing program to upgrade the capabilities of the SCADA system.

6.3 Major Maintenance – 2017

Major maintenance projects undertaken in 2017 include:

- Re-built pump and motor at Well No. 1
- Re-build motor at Well No. 8

6.4 Cross Connection Control Program

A cross connection is most commonly a plumbing system in a building that represents the risk of backflow into the Town's water distribution system thereby representing the potential of adversely affecting water quality. The Town has a program for identifying cross connections and requiring the installation and maintenance of backflow prevention devices to prevent reverse flow from a service connection to the Town's water distribution system.

The implementation and administration of the Town's cross connection program is contracted to Mr. Wayne Muzyka of Personnel Development & Consulting of Vernon. The Town's cross connection control program includes a total devices of which:

- 95 are classified as high hazard
- 76 are classified as medium hazard
- 47 are classified as low hazard

To the end of December 2017, a total of 190 of the backflow devices have been surveyed which comprises an inspection of the premises and backflow prevention devices. Of the high hazard group, 99% have been surveyed. At the end of December 2017, compliance with the Town's cross connection control program is summarized as follows.

Hazard Category		Compliant		
		Surveyed	Number	%
High	95	94	66	70%
Medium	76	58	41	71%
Low	47	38	16	42%

Non-compliance generally means a deficient (or lack of) backflow prevention device or failure by the property owner to provide certification of annual testing.

6.5 Emergency Response Plan

The Town has an emergency response plan for the water and sanitary sewer utilities which is available for public viewing at Operational Services. The plan describes strategies to respond to a wide range of water related events including source and distribution system contamination, high turbidity events in Osoyoos Lake, broken water main, chlorination failure, vandalism and extended interruption in electrical service. The emergency response plan was last updated in 2015.

7.0 Capital Program

7.1 Municipal System

7.1.1 Completed Capital Projects for 2017

- Pump test of Well No. 7 to determine if it is viable as a production well.
- Construction of 370 m of 150 mm water main on Lakeshore Drive between 56 Avenue and Highway No. 3.
- Twin the 250mm Town watermain into the South half of Irrigation District No. 8 from 74 Avenue to 148 Avenue.

7.1.2 Budgeted Capital Projects for 2018

- Installation of Twin 300 mm water mains between Gyro Park and the Holiday Inn under Osoyoos Lake.
- Design improvements to Well No. 8 (replacement of existing submersible pump with a new vertical turbine pump and associated appurtenances)
- Retro-fitting Well No. 1 to be able to inject chlorine into the water distribution system.
- Design the necessary infrastructure improvements required to upgrade Well No. 7 into a full production well for the domestic water system.
- Purchase and installation of a new master SCADA computer and as well as numerous radio upgrades throughout the system.

7.1.3 Other Water Related Budget Items

- Completion of Long Range System Upgrading Plan to provide disinfection (chlorination) with contact time and manganese removal for all water supply wells.

7.1.4 Master Plan

The Town's plan to upgrade treatment works for the municipal system is based on a comprehensive groundwater quality and contamination risks assessment study of the well sources by Western Water Associates dated 2012 and pilot testing in 2012 of biological processes for removal of manganese. The treatment plan for the municipal system comprises:

- a treatment plant for manganese removal and disinfection by chlorination located at Jack Shaw Gardens.
- raw water piping from existing Wells 1,3,4,5 and 8 to the treatment plant.
- Well No. 7 would be upgraded to a full production well and a second treatment facility would be constructed near existing Well No. 6. This second treatment facility would process water from Wells 6 & 7 for manganese removal and disinfection by chlorination.

The removal of manganese from the Town's well water should result in an improvement in the appearance and taste of the domestic supply while improved disinfection from chlorination will minimize possible health concerns.

7.2 Water District (Irrigation Systems 8 and 9)

7.2.1 Completed Projects in 2017

- Contracts No. 1 and 2 of the Rural Water Twinning Project (South half of System No. 8 service area from 74th Ave to 148th Ave and Highway 97 ROW; Highway 3 to 148 Ave)

7.2.2 Budgeted Capital Projects for 2018

- Contract No. 3 of the Rural Water Twinning Project (87 Street – 104 Avenue to Highway 97)
- Installation of 136 water meters in the areas which have received domestic water connections as a result of the above noted three Rural Water Twinning projects.

7.2.3 Master Plan

In 2008, the Town of Osoyoos adopted a plan to construct twin domestic water distribution systems in the Systems 8 and 9 service areas to comply with IHA 43210 drinking water treatment standards. The twin domestic water systems will be supplied by municipal system groundwater sources thereby discontinuing the use of intakes in Osoyoos Lake as potable water sources.

To date, twin domestic water distribution mains are in service on 74th Avenue and on the west side of H97 from 74th Avenue to Mariposa.

The Twinning project will be undertaken in four phases as described below:

Phase 1 South half of System No. 8 service area from 74th Ave to 148th Ave.

Phase 2 East half of System No. 9 service area generally comprising the area East of Hwy 97 from 32nd Ave to the USA border, including the supply main from Nighthawk Drive.

Phase 3 West half of System No. 9 service area comprising the area West of Hwy 97 from 74th Ave to the USA border.

Phase 4 North half of System No. 8 service area from 148th Ave to Willow Beach.

Note: Maps illustrating the areas which now have access to Town of Osoyoos domestic well water are enclosed on Appendix F of this report.

APPENDIX A

Bacteriological Test Results

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
Well #1	Jan 4/17	Jan 5/17	<1	<1
4220 Lobelia	Jan 4/17	Jan 5/17	<1	<1
8707 78th Ave.	Jan 10/17	Jan 11/17	<1	<1
5302 Lombardy Lane	Jan 10/17	Jan 11/17	<1	<1
4220 Lobelia	Jan 17/17	Jan 18/17	<1	<1
Well #3	Jan 17/17	Jan 18/17	<1	<1
5302 Lombardy Lane	Jan 24/17	Jan 25/17	<1	<1
6812 89th	Jan 24/17	Jan 25/17	<1	<1
Well #3	Jan 31/17	Feb 1/17	<1	<1
4220 Lobelia	Jan 31/17	Feb 1/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
9707 87th	Jan 4/17	Jan 5/17	<1	<1
9707 87th	Jan 10/17	Jan 11/17	<1	<1
9103 100th Ave	Jan 17/17	Jan 18/17	<1	<1
9707 87th	Jan 24/17	Jan 25/17	<1	<1
9103 100th Ave	Jan 31/17	Feb 1/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5001 107th	Jan 4/17	Jan 5/17	<1	<1
5001 107th	Jan 10/17	Jan 11/17	<1	<1
10021 42nd Ave	Jan 17/17	Jan 18/17	<1	<1
5001 107th	Jan 24/17	Jan 25/17	<1	<1
10021 42nd Ave	Jan 31/17	Feb 1/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5302 Lombardy Lane	Feb 7/17	Feb 8/17	<1	<1
4220 Lobelia	Feb 7/17	Feb 8/17	<1	<1
4220 Lobelia	Feb 14/17	Feb 15/17	<1	<1
Well #3	Feb 14/17	Feb 15/17	<1	<1
5302 Lombardy Lane	Feb 21/17	Feb 22/17	<1	<1
Well #8	Feb 21/17	Feb 22/17	<1	<1
Well #3	Feb 28/17	Mar 1/17	<1	<1
4220 Lobelia	Feb 28/17	Mar 1/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
9707 87th	Feb 7/17	Feb 8/17	<1	<1
9103 100th	Feb 14/17	Feb 15/17	<1	<1
9707 87th	Feb 7/17	Feb 8/17	<1	<1
9103 100th	Feb 28/17	Mar 1/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5001 107th	Feb 7/17	Feb 8/17	<1	<1
10021 42nd Ave	Feb 14/17	Feb 15/17	<1	<1
5001 107th	Feb 21/17	Feb 22/17	<1	<1
5001 107th	Feb 7/17	Feb 8/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
Well #8	Mar 7/17	Mar 8/17	<1	<1
4220 Lobelia	Mar 7/17	Mar 8/17	<1	<1
4220 Lobelia	Mar 14/17	Mar 15/17	<1	<1
Well #8	Mar 14/17	Mar 15/17	<1	<1
5302 Lombardy	Mar 21/17	Mar 22/17	<1	<1
8707 78th	Mar 21/17	Mar 22/17	<1	<1
4220 Lobelia	Mar 28/17	Mar 29/17	<1	<1
6812 89th	Mar 28/17	Mar 29/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
9707 87th	Mar 7/17	Mar 8/17	<1	<1
9103 100th	Mar 14/17	Mar 15/17	<1	<1
9707 87th	Mar 21/17	Mar 22/17	<1	<1
9103 100th	Mar 28/17	Mar 29/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5001 107th	Mar 7/17	Mar 8/17	<1	<1
10021 42nd	Mar 14/17	Mar 15/17	<1	<1
5001 107th	Mar 21/17	Mar 22/17	<1	<1
10021 42nd	Mar 28/17	Mar 29/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
8707 78th	Apr 4/17	Apr 5/17	<1	<1
4220 Lobelia	Apr 4/17	Apr 5/17	<1	<1
4220 Lobelia	Apr 11/17	Apr12/17	<1	<1
5302 Lombardy	Apr 11/17	Apr12/17	<1	<1
Well #8	Apr 18/17	Apr 19/17	<1	<1
Well #3	Apr 18/17	Apr 19/17	<1	<1
4220 Lobelia	Apr 25/17	Apr 26/17	5	<1
5302 Lombardy	Apr 25/17	Apr 26/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
9707 87th	Apr 4/17	Apr 5/17	<1	<1
9103 100th	Apr 11/17	Apr12/17	<1	<1
9707 87th	Apr 18/17	Apr 19/17	<1	<1
9103 100th	Apr 25/17	Apr 26/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5001 107th	Apr 4/17	Apr 5/17	<1	<1
10021 42nd Ave	Apr 11/17	Apr12/17	<1	<1
5001 107th	Apr 18/17	Apr 19/17	<1	<1
10021 42nd Ave	Apr 25/17	Apr 26/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
Well #3	May 2/17	May 3/17	<1	<1
4220 Lobelia	May 2/17	May 3/17	<1	<1
5402 Lombardy	May 9/17	May 10/17	<1	<1
8707 78th	May 9/17	May 10/17	<1	<1
Well #3	May 16/17	May 17/17	<1	<1
10130 24th Ave	May 16/17	May 17/17	<1	<1
5302 Lombardy Lane	May 23/17	May 24/17	<1	<1
Well #8	May 23/17	May 24/17	1	<1
5302 Lakeshore	May 30/17	May 31/17	<1	<1
Well #8	May 30/17	May 31/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
9707 87th	May 2/17	May 3/17	<1	<1
9103 100th	May 9/17	May 10/17	<1	<1
9707 87th	May 16/17	May 17/17	<1	<1
9103 100th	May 23/17	May 24/17	<1	<1
20835 103rd	May 30/17	May 31/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5001 107th	May 2/17	May 3/17	<1	<1
10021 42nd	May 9/17	May 10/17	<1	<1
5001 107th	May 16/17	May 17/17	<1	<1
10021 42nd	May 23/17	May 24/17	<1	<1
5001 107th	May 30/17	May 31/17	1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
4220 Lobelia	Jun 6/17	Jun 7/17	<1	<1
Well #3	Jun 6/17	Jun 7/17	<1	<1
5302 Lombardy	Jun 13/17	Jun 14/17	<1	<1
8707 78th	Jun 13/17	Jun 14/17	<1	<1
4220 Lobelia	Jun 20/17	Jun 21/17	<1	<1
Well #3	Jun 20/17	Jun 21/17	<1	<1
Well #1	Jun 27/17	Jun 28/17	<1	<1
5302 Lombardy	Jun 27/17	Jun 28/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
9103 100th Ave	Jun 6/17	Jun 7/17	<1	<1
20835 103rd	Jun 13/17	Jun 14/17	<1	<1
9103 100th Ave	Jun 20/17	Jun 21/17	<1	<1
20835 103rd	Jun 27/17	Jun 28/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5001 107th	Jun 6/17	Jun 7/17	<1	<1
10021 42nd Ave	Jun 13/17	Jun 14/17	<1	<1
5001 107th	Jun 20/17	Jun 21/17	<1	<1
10021 42nd Ave	Jun 27/17	Jun 28/17	OVERGROWN	OVERGROWN

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
Well #8	Jul 4/17	Jul 5/17	<1	<1
8707 78th	Jul 4/17	Jul 5/17	<1	<1
Well #8	Jul 11/17	Jul 12/17	<1	<1
8707 78th	Jul 11/17	Jul 12/17	<1	<1
5229 Lakeshore Drive	Jul 18/17	Jul 19/17	<1	<1
6812 89th St	Jul 18/17	Jul 19/17	<1	<1
Well #8	Jul 25/17	Jul 26/17	<1	<1
5302 Lombardy Lane	Jul 25/17	Jul 26/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
9130 100th Ave	Jul 4/17	Jul 5/17	<1	<1
20835 103rd	Jul 11/17	Jul 12/17	<1	<1
20835 103rd	Jul 18/17	Jul 19/17	<1	<1
20835 103rd	Jul 25/17	Jul 26/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
10021 42nd Ave	Jul 4/17	Jul 5/17	<1	<1
5001 107th	Jul 11/17	Jul 12/17	<1	<1
10021 42nd Ave	Jul 18/17	Jul 19/17	<1	<1
10021 42nd Ave	Jul 25/17	Jul 26/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
8707 78th	Aug 1/17	Aug 2/17	<1	<1
Well #1	Aug 1/17	Aug 2/17	<1	<1
5302 Lombardy	Aug 8/17	Aug 9/17	<1	<1
4220 Lobelia	Aug 8/17	Aug 9/17	<1	<1
5229 Lakeshore	Aug 15/17	Aug 16/17	<1	<1
6812 89th	Aug 15/17	Aug 16/17	<1	<1
5302 Lakeshore	Aug 22/17	Aug 23/17	<1	<1
8707 78th	Aug 22/17	Aug 23/17	<1	<1
Well #8	Aug 29/17	Aug 30/17	<1	<1
5302 Lombardy	Aug 29/17	Aug 30/17	1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
20835 103rd	Aug 1/17	Aug 2/17	<1	<1
20970 103rd	Aug 8/17	Aug 9/17	<1	<1
20835 103rd	Aug 15/17	Aug 16/17	<1	<1
20835 103rd	Aug 22/17	Aug 23/17	<1	<1
20970 103rd	Aug 29/17	Aug 30/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5001 107th	Aug 1/17	Aug 2/17	<1	<1
10021 42nd Ave	Aug 8/17	Aug 9/17	<1	<1
5001 107th	Aug 15/17	Aug 16/17	<1	<1
10021 42nd Ave	Aug 22/17	Aug 23/17	<1	<1
5001 107th	Aug 29/17	Aug 30/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
4220 Lobelia	Sept 5/17	Sept 6/17	<1	<1
Well #3	Sept 5/17	Sept 6/17	<1	<1
5302 Lombardy	Sept 12/17	Sept 13/17	1	<1
8707 78th	Sept 12/17	Sept 13/17	<1	<1
5302 Lombardy	Sept 19/17	Sept 20/17	28	<1
Well #1	Sept 19/17	Sept 20/17	<1	<1
5302 Lombardy	Sept 26/17	Sept 27/17	<1	<1
Well #3	Sept 26/17	Sept 27/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
20835 103rd	Sept 5/17	Sept 6/17	<1	<1
20835 103rd	Sept 12/17	Sept 13/17	<1	<1
20970 103rd	Sept 19/17	Sept 20/17	<1	<1
20835 103rd	Sept 26/17	Sept 27/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
10021 42nd Ave	Sept 5/17	Sept 6/17	<1	<1
5001 107th	Sept 12/17	Sept 13/17	<1	<1
10021 42nd Ave	Sept 19/17	Sept 20/17	<1	<1
5001 107th	Sept 26/17	Sept 27/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
4220 Lobelia	Oct 3/17	Oct 4/17	<1	<1
Well #1	Oct 3/17	Oct 4/17	<1	<1
Well #3	Oct 10/17	Oct 11/17	<1	<1
8707 78th	Oct 10/17	Oct 11/17	4	<1
5302 Lombardy	Oct 17/17	Oct 18/17	<1	<1
4220 Lobelia	Oct 17/17	Oct 18/17	3	<1
Well #3	Oct 24/17	Oct 25/17	<1	<1
4220 Lobelia	Oct 24/17	Oct 25/17	<1	<1
5302 Lombardy	Oct 31/17	Nov 1/17	<1	<1
8707 78th	Oct 31/17	Nov 1/17	<1	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
20970 103rd	Oct 3/17	Oct 4/17	<1	<1
20835 103rd	Oct 10/17	Oct 11/17	<1	<1
20970 103rd	Oct 17/17	Oct 18/17	<1	<1
20835 103rd	Oct 24/17	Oct 25/17	<1	<1
20835 103rd	Oct 31/17	Nov 1/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
5001 107th	Oct 3/17	Oct 4/17	<1	<1
10021 42nd	Oct 10/17	Oct 11/17	<1	<1
5001 107th	Oct 17/17	Oct 18/17	<1	<1
10021 42nd	Oct 24/17	Oct 25/17	<1	<1
5001 107th	Oct 31/17	Nov 1/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
4220 Lobelia	Nov 7/17	Nov 8/17	<1	<1
6812 89th	Nov 7/17	Nov 8/17	<1	<1
Well #1	Nov 14/17	Nov 15/17	<1	<1
5302 Lombardy	Nov 14/17	Nov 15/17	<1	<1
Well #3	Nov 21/17	Nov 22/17	<1	<1
4220 Lobelia	Nov 21/17	Nov 22/17	22	<1
5302 Lombardy	Nov 28/17	Nov 29/17	4	<1
4220 Lobelia	Nov 28/17	Nov 29/17	28	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
20835 103rd St	Nov 7/17	Nov 8/17	<1	<1
20970 103rd St	Nov 14/17	Nov 15/17	<1	<1
25723 103rd St	Nov 21/17	Nov 22/17	<1	<1
20835 103rd St	Nov 28/17	Nov 29/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
10021 42nd Ave	Nov 7/17	Nov 8/17	<1	<1
5001 107th	Nov 14/17	Nov 15/17	<1	<1
10021 42nd Ave	Nov 21/17	Nov 22/17	<1	<1
5001 107th	Nov 28/17	Nov 29/17	<1	<1

TOWN SYSTEM

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
4220 Lobelia	Dec 5/17	Dec 6/17	<1	<1
5302 Lombardy	Dec 5/17	Dec 6/17	<1	<1
Well #3	Dec 12/17	Dec 13/17	<1	<1
7802 89th	Dec 12/17	Dec 13/17	<1	<1
5708 Lombardy	Dec 19/17	Dec 20/17	<1	<1
7203 85th	Dec 19/17	Dec 20/17	<1	<1
Well #3	Dec 27/17	Dec 28/17	<1	<1
8707 78th Ave	Dec 27/17	Dec 28/17	5	<1

SYSTEM 8

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
20970 103rd	Dec 5/17	Dec 6/17	<1	<1
25723 103rd	Dec 12/17	Dec 13/17	<1	<1
20835 103rd	Dec 19/17	Dec 20/17	<1	<1
20835 103rd	Dec 27/17	Dec 28/17	<1	<1

SYSTEM 9

LOCATION	DATE COLLECTED	DATE ANALYZED	COLIFORM TOTAL	E.COLI
10021 42nd	Dec 5/17	Dec 6/17	<1	<1
5001 107th	Dec 12/17	Dec 13/17	<1	<1
10021 42nd	Dec 19/17	Dec 20/17	<1	<1
5001 107th	Dec 27/17	Dec 28/17	<1	<1

Chlorine Readings

DATE	# 8	# 9	Staff
Jan 4/17	0.9	0.6	KF
Jan 10/17	0.8	0.5	FZ
Jan 17/17	0.8	0.6	DS
jan 24/17	0.9	0.7	FZ
Jan 31/17	0.6	0.4	KF
Monthly Average	**0.80**	**0.56**	
Feb 7/17	1	0.8	DS
Feb 14/17	0.7	0.5	KF
Feb 21/17	0.9	0.7	DS
Feb 28/17	0.7	0.7	DS
Monthly Average	**0.83**	**0.68**	
Mar 7/17	0.8	0.9	DS
Mar 14/17	0.5	0.5	FZ
Mar 21/17	0.6	0.6	FZ
Mar 28/17	0.6	0.6	FZ
Monthly Average	**0.63**	**0.65**	
Apr 4/17	0.7	0.4	KF
Apr 11/17	0.5	0.4	FZ
Apr 18/17	0.6	0.5	FZ
Apr 25/17	0.7	0.2	DS
Monthly Average	**0.63**	**0.38**	
May 2/17	0.2	0.4	KF
May 9/17	0.4	0.8	FZ
May 16/17	0.2	0.3	KF
May 23/17	0.6	0.5	LL
May 30/17	0.7	0.7	DS
Monthly Average	**0.42**	**0.54**	
Jun 6/17	0.8	0.6	KF
Jun 13/17	0.7	1	FZ
Jun 20/17	0.2	0.6	KF
Jun 27/17	0.6	0.6	LL
Monthly Average	**0.58**	**0.70**	

DATE	# 8	# 9	Staff
Jul 4/17	0.6	1	KF
Jul 11/17	0.6	0.7	FZ
Jul 18/17	0.7	0.6	FZ
Jul 25/17	0.6	0.7	DS
Monthly Average	**0.63**	**0.75**	
Aug 1/17	0.6	0.7	KF
Aug 8/17	0.9	0.9	FZ
Aug 15/17	0.5	0.8	FZ
Aug 22/17	0.8	0.9	FZ
Aug 29/17	0.8	0.8	DS
Monthly Average	**0.72**	**0.82**	
Sept 5/17	0.8	0.8	LL
Sept 12/17	0.6	0.6	KF
Sept 19/17	0.8	0.9	LL
Sept 26/17	0.6	0.8	FZ
Monthly Average	**0.70**	**0.78**	
Oct 3/17	0.8	0.5	LL
Oct 10/17	0.6	0.7	LL
Oct 17/17	0.2	0.2	KF
Oct 24/17	0.6	0.3	DS
Oct 31/17	0.4	0.6	FZ
Monthly Average	**0.52**	**0.46**	
Nov 7/17	0.1	0.1	FZ
Nov 14/17	0.5	0.4	DS
Nov 21/17	0.5	0.4	DS
Nov 28/17	0.5	0.5	FZ
Monthly Average	**0.40**	**0.35**	
Dec 5/17	0.4	0.3	LL
Dec 12/17	0.3	0.4	DS
Dec 19/17	0.6	0.5	KF
Dec 26/17	0.3	0.5	FZ
Monthly Average	**0.40**	**0.43**	

APPENDIX B

Water Supply Well
Full Spectrum Water Quality Analysis

BRITISH COLUMBIA

Ministry of Forests, Lands and Natural Resource Operation
Water Management Branch

Annual Water System Return

COPY

February 07, 2018

TOWN OF OSOYOOS

8707 Main Street
Osoyoos, BC
V0H 1V0

Return report	March 15, 2018
Client No:	37953
Water System	380
Water System	TOWN OF OSOYOOS
Owner	Town of Osoyoos

The information in this report will be considered in the calculation of your next annual rental. Failure to verify this information, and complete and return the form by the due date, may result in being charged at the maximum level as determined

For Calendar Year: 2017

Purpose:	Total Volume cubic meters	Metered Location		Is any of your water supply from a Groundwater Source?	If Yes, what percentage of the Total Supply?
Water Works	2,613,168	At the Source	0	Yes	35.4%
		At the Customer	0		
		or Not Metered	2,613,168		
Irrigation	5,621,306	At the Source	0	Yes	20.9%
		At the Customer	0		
		or Not Metered	5,621,306		

Minimum Daily Demand:		Date:	Maximum Daily Demand:		Date:
0	cubic meters	October 14	4,012	cubic meters	August 05

Source(s) of Water Used

Please indicate the source name(s) and the percentage of supply obtained from each.

1. Village Spring 74.6%
2. Well 83013 11.4%
3. Well 82359 4.8%

Attach a list to report additional sources.

Please provide the following information about Your Customers:

Number of Residential Connections 4352
Number of Other Connections: 1275
Total Population: 6575
Basis of Estimate: Best local estimates
Cultivated Area: 184 Acres

A listing of existing licenses held in your name is enclosed. If any of these licenses are not used and do not form part of your development plan, you should consider their abandonment.

I certify that the above information is correct.

Signature of Official: Jim Dinwoodie Position/Title: Director of Operational Services

Print Name: Jim Dinwoodie Phone No. 250-495-4618 Date: February 07, 2018

Additional

4.	Well 82358	3.8%
5.	Well 83015	2.6%
6.	Well 83016	1.6%
7.	Well 83014	1.2%
8.	Well 14946	0.0%
9.	Well 18702	0.0%
10.	Well 46166	0.0%
11.	Well 23342	0.0%
12.	Well 82357	0.0%
13.	Well 23427	0.0%
14.	Well 40518	0.0%
15.	Well 23634	0.0%
16.	Well 40512	0.0%
17.	Well 23523	0.0%
18.	Well 23633	0.0%
19.	Well 15762	0.0%
20.	Well 19179	0.0%
21.	Well 18105	0.0%
22.	Well 42224	0.0%

Client No: 37953 **Water System** TOWN OF OSOYOOS

License Number	File Number	Purpose	Volume	Unit	Stream Name
C018134/PD75216	165235	WATERWORKS: LOCAL	165932.285	MY	Village Spring

COPY

CARO ANALYTICAL SERVICES

RECEIVED SEP 28 2017

SAMPLE ANALYTICAL DATA

REPORTED TO Osoyoos, Town of
PROJECT General Potability

WORK ORDER 7091762
REPORTED 2017-09-27

Analyte	Result / *Recovery*	Standard / Guideline	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town System Well #1 (7091762-01) [Water] Sampled: 2017-09-19 11:25							
Anions							
Chloride	**56.8**	AO ≤ 250	0.10	mg/L	N/A	2017-09-21	
Fluoride	**0.35**	MAC = 1.5	0.10	mg/L	N/A	2017-09-21	
Nitrate (as N)	**5.13**	MAC = 10	0.010	mg/L	N/A	2017-09-21	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2017-09-21	
Sulfate	**75.7**	AO ≤ 500	1.0	mg/L	N/A	2017-09-21	
General Parameters							
Alkalinity, Total (as CaCO3)	**255**	N/A	1.0	mg/L	N/A	2017-09-21	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	N/A	2017-09-21	
Alkalinity, Bicarbonate (as CaCO3)	**255**	N/A	1.0	mg/L	N/A	2017-09-21	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	N/A	2017-09-21	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	N/A	2017-09-21	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	N/A	2017-09-22	
Conductivity (EC)	**789**	N/A	2.0	µS/cm	N/A	2017-09-21	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	N/A	2017-09-21	
pH	**7.65**	7.0-10.5	0.10	pH units	N/A	2017-09-21	HT2
Temperature, at pH	**22**	N/A		°C	N/A	2017-09-21	HT2
Turbidity	< 0.10	OG < 0.1	0.10	NTU	N/A	2017-09-20	
Calculated Parameters							
Hardness, Total (as CaCO3)	**339**	None Required	0.500	mg/L	N/A	N/A	
Langelier Index	**0.6**	N/A	-5.0	-	N/A	2017-09-27	
Solids, Total Dissolved (calc)	**479**	N/A	1.00	mg/L	N/A	N/A	
Total Metals							
Aluminum, total	< 0.0050	OG < 0.1	0.0050	mg/L	2017-09-25	2017-09-26	
Antimony, total	**0.00020**	MAC = 0.006	0.00020	mg/L	2017-09-25	2017-09-26	
Arsenic, total	**0.00510**	MAC = 0.01	0.00050	mg/L	2017-09-25	2017-09-26	
Barium, total	**0.0563**	MAC = 1	0.0050	mg/L	2017-09-25	2017-09-26	
Boron, total	**0.0599**	MAC = 5	0.0050	mg/L	2017-09-25	2017-09-26	
Cadmium, total	**0.000037**	MAC = 0.005	0.000010	mg/L	2017-09-25	2017-09-26	
Calcium, total	**102**	None Required	0.20	mg/L	2017-09-25	2017-09-26	
Chromium, total	**0.00076**	MAC = 0.05	0.00050	mg/L	2017-09-25	2017-09-26	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2017-09-25	2017-09-26	
Copper, total	**0.00728**	AO ≤ 1	0.00040	mg/L	2017-09-25	2017-09-26	
Iron, total	**0.015**	AO ≤ 0.3	0.010	mg/L	2017-09-25	2017-09-26	
Lead, total	**0.00046**	MAC = 0.01	0.00020	mg/L	2017-09-25	2017-09-26	
Magnesium, total	**20.5**	None Required	0.010	mg/L	2017-09-25	2017-09-26	
Manganese, total	**0.00030**	AO ≤ 0.05	0.00020	mg/L	2017-09-25	2017-09-26	
Mercury, total	< 0.000010	MAC = 0.001	0.000010	mg/L	2017-09-24	2017-09-24	
Molybdenum, total	**0.0134**	N/A	0.00010	mg/L	2017-09-25	2017-09-26	
Nickel, total	**0.00092**	N/A	0.00040	mg/L	2017-09-25	2017-09-26	
Potassium, total	**6.33**	N/A	0.10	mg/L	2017-09-25	2017-09-26	
Selenium, total	**0.00090**	MAC = 0.05	0.00050	mg/L	2017-09-25	2017-09-26	
Sodium, total	**39.1**	AO ≤ 200	0.10	mg/L	2017-09-25	2017-09-26	
Uranium, total	**0.00735**	MAC = 0.02	0.000020	mg/L	2017-09-25	2017-09-26	
Zinc, total	**0.0237**	AO ≤ 5	0.0040	mg/L	2017-09-25	2017-09-26	

CARO ANALYTICAL SERVICES

COPY

SAMPLE ANALYTICAL DATA

REPORTED TO	Osoyoos, Town of	**WORK ORDER**	7091762
PROJECT	General Potability	**REPORTED**	2017-09-27

Analyte	Result / *Recovery*	Standard / Guideline	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town System Well #1 (7091762-01) [Water] Sampled: 2017-09-19 11:25, Continued							
Microbiological Parameters							
Coliforms, Total	< 1	MAC = None Detected	1	CFU/100 mL	N/A	2017-09-20	
E. coli	< 1	MAC = None Detected	1	CFU/100 mL	N/A	2017-09-20	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

CARO ANALYTICAL SERVICES

RECEIVED JUN 13 2017

SAMPLE ANALYTICAL DATA

COPY

REPORTED TO Osoyoos, Town of
PROJECT Monitoring Wells

WORK ORDER 7060664
REPORTED 2017-06-13

Analyte	Result / *Recovery*	Standard / Guideline	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town System Well #8 (7060664-01) [Water] Sampled: 2017-06-06 10:35							
Anions							
Nitrate (as N)	**0.627**	MAC = 10	0.010	mg/L	N/A	2017-06-09	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2017-06-09	
Calculated Parameters							
Hardness, Total (as CaCO3)	**170**	N/A	0.500	mg/L	N/A	N/A	
Nitrate+Nitrite (as N)	**0.627**	N/A	0.0200	mg/L	N/A	N/A	
Total Metals							
Calcium, total	**45.9**	N/A	0.20	mg/L	2017-06-12	2017-06-12	
Magnesium, total	**13.5**	N/A	0.010	mg/L	2017-06-12	2017-06-12	
Manganese, total	**0.0729**	AO ≤ 0.05	0.00020	mg/L	2017-06-12	2017-06-12	
Sample ID: Town System Well #3 (7060664-02) [Water] Sampled: 2017-06-06 10:55							
Anions							
Nitrate (as N)	**1.73**	MAC = 10	0.010	mg/L	N/A	2017-06-09	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2017-06-09	
Calculated Parameters							
Hardness, Total (as CaCO3)	**276**	N/A	0.500	mg/L	N/A	N/A	
Nitrate+Nitrite (as N)	**1.73**	N/A	0.0200	mg/L	N/A	N/A	
Total Metals							
Calcium, total	**75.0**	N/A	0.20	mg/L	2017-06-12	2017-06-12	
Magnesium, total	**21.4**	N/A	0.010	mg/L	2017-06-12	2017-06-12	
Manganese, total	**0.0109**	AO ≤ 0.05	0.00020	mg/L	2017-06-12	2017-06-12	

APPENDIX C

Summary of Nirate Monitoring

Summary of Nitrate Data					
	Well #1	**Well #3**	**Well #4-5**	**Well #6**	**Well #8**
Jun-08	5.12		1.51		0.529 (158)
Sep-08	5.59	4.8	0.88 (279)		
Sep-08			0.7 (262)	2.69 (299)	0.27 (154)
Jun-09	3.87		1.81	1.62	0.34
Aug-09	4.76			1.57 (306)	
Sep-09		4.09	1.04	2.03	0.34
Dec-09		3.44		1.9	
Jun-10	4.7	3.02			0.6
Jul-10	4.62	2.78		1.51	0.47
Oct-10	4.45	3.13			
Dec-10		2.72		2.54	2.76
Sep-11	4.96	3.09	0.13 (216)		0.5
Dec-11		0.5		2.68	
Sep-12					0.35 (139)
Sep-13					0.26 (155)
Sep-13	4.99	3.05			1.56
Jun-14		2.14	0.01		0.45
Oct-14			<0.01 (240)		
Oct-14			<0.01 (244)		
Sep-15		2.05			1.69
Dec-16	4.31	2.59		2.96	
Jun-17		2.68			0.627
Averages	4.74	2.86	1.09	2.18	0.97

APPENDIX D

Cross Connection Control Program

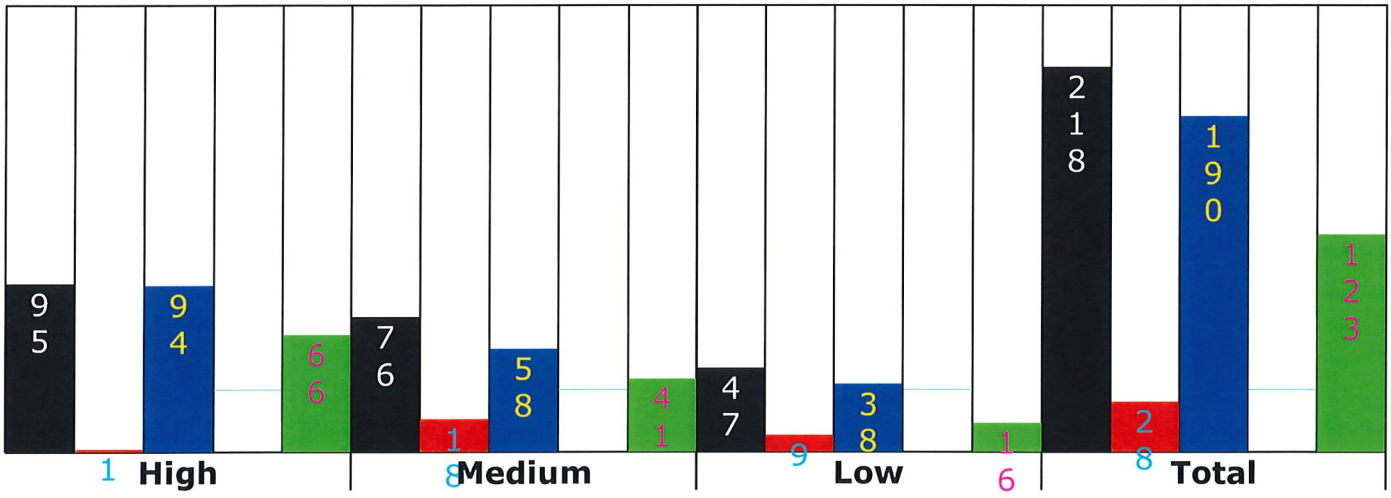
Cross-Connection Control Program

Town of Osoyoos

Summary Report - Feb 19, 2018

Customers	229
BFP's Tracked	324

Hazards	Quantity	Not Surveyed	Surveyed	Vacant	Compliant
High	95	1	94	0	66
Medium	76	18	58	0	41
Low	47	9	38	0	16
Totals	218	28	190	0	123



Legend
Total
Not Surveyed
Surveyed
Vacant
Compliant

APPENDIX E

Notice of Water Restrictions

WATER CONSERVATION TIPS

- Water when the sun is low, winds are calm and temperatures are cooler *(see staged restrictions)*.

Divide by zones

- Different plants need different amounts of water.
- Divide your yard and landscape areas into separate irrigation zones so that grass can be watered separately and more frequently than groundcovers, shrubs and trees.



- Both sprinkler and drip irrigation can be incorporated to achieve more efficient use of water.

Water only things that grow

- If you have an underground sprinkler system, make sure the sprinkler heads are adjusted properly to avoid watering sidewalks and driveways.

Do routine inspections

- Periodically check your sprinklers to make sure everything is working properly.

Be rain smart

- Adjust your irrigation system as the seasons and weather change.

WATER SERVICES CONTACT INFORMATION

Town of Osoyoos
Operational Services
11500 115 Street, Box 3010
Osoyoos, BC V0H 1V0
(T) 250.495.6213
(TF) 888.495.6515
(E) pubworks@osoyoos.ca

"After Hours" Emergency Contact
(C) 250.498.7676

FREQUENTLY ASKED QUESTIONS (FAQ's)

How will I be notified when the stages change, e.g. Normal to Stage 1?
Notification will be published:

- Town's Website www.osoyoos.ca
- Local Radio Station, e.g. EZ Rock 102.9 FM
- Osoyoos Times

Also may be published by other means as determined by the CAO.

My water is discoloured what can/should I do?
You may be experiencing discoloured water due to the increased water usage that occurs in the spring, don't be alarmed.

- Run a cold faucet for about 10-15 minutes or until the water clears.
- Do not use a hot water tap as doing so may draw sediment into your hot water tank.
- Do not choose a faucet with a water filter connected to it, as sediment may clog the filter.

How often is the water being tested? And by whom?
The testing of water samples is done weekly by CARO Analytical Services located in Kelowna.

DID YOU KNOW?

The average adult drinks only about 3.8 litres of water per day, and that includes water used in drinks such as coffee, tea and juice.
LIVESTRONG.COM



Dripping taps are a major cause of wasted water and can also cause water damage in the home. Fixing a dripping tap can save up to 300 litres of quality BC drinking water per week.

For more tips and information please go to www.livingwatersmart.ca.

Osoyoos
Canada's warmest welcome ®*



NORMAL

Water Conservation & Staged Restrictions Bylaw No. 1273

Revised on May 3, 2017

***REFER TO THE COMPLETE BYLAW FOR FULL DETAILS**

Town of Osoyoos
8707 Main Street, Box 3010
Osoyoos BC V0H 1V0
(T) 250.495.6515
(TF) 888.495.6515
(E) info@osoyoos.ca
(W) www.osoyoos.ca

GUIDELINES



PERMITS: The following permits are available:

Sod Watering - for those who have installed a new lawn, either newly seeded or new sod.
Power Washing - Available to a building owner or lessee which has a business license.
Water Mister – Available to a company which has a business license.

- Permits available at the Town office.
- Permits will NOT be issued during Stage 3, 4, or 5 restrictions.

EXEMPTIONS: People who by reason of physical or mental incapacity that are unable to water their property within the restricted days and times may be eligible for an exemption.

Watering of flower and vegetable gardens, decorative planters, shrubs and trees using micro-irrigation, drip-irrigation, or a hose with an automatic shut off nozzle.

For more information refer to the bylaw or contact the Town *Environment Stewardship Ambassador.*

ENFORCEMENT: Bylaw Enforcement Officers have the authority to enter at all reasonable times on any property that is subject to the bylaw to ascertain if the bylaw requirements are being violated.

FINES: The penalty for not complying with the bylaw will result in the following:

- Either a Municipal Ticket of **$100** being issued, or
- Town may turn off water and it will not be turned back on until the person has remedied the default.

The turning on/off of a water service will be at the sole discretion of the Town.

The charge for turning OFF the water for non-compliance with the bylaw is $50.00 and another $50.00 will be charged for turning the water ON.

WATER RESTRICTION STAGES

STAGES		
Guidelines	**AUTOMATICALLY Controlled Underground Sprinkling Systems (Residential and Commercial)** **Properties equipped with an automated time clock sprinkler system may sprinkle between the hours of 12:00 MIDNIGHT to 6:00 AM on the days permitted by the stages.** **MANUALLY Controlled Sprinklers (Residential and Commercial)** **Properties equipped with only manually controlled sprinkling systems, including those attached to outside taps, may operate from 6:00 AM to 10:00 AM and from 7:00 PM to 12:00 MIDNIGHT on the days permitted by the stages.**	
	• **NO use of water hoses permitted for the purpose of washing boats or motor vehicles unless the spray gun or spray wand are equipped with an automatic shut off nozzle.** • **NO sprinkling between the hours of 10:00 AM and 7:00 PM during any day at any time of the year.** • **NO use of water to wash sidewalks, driveways or parking lots, except if necessary for applying a product such as paint or preservative.** • **Only one ½" (9mm) diameter outlet (outside tap) may be used at one time for sprinkling, and furthermore, it is not permissible to use an open pipe or hose for irrigating purposes.**	
Normal	**EFFECTIVE IMMEDIATELY →** **Unless otherwise notified – refer to FAQ's** **DAYS OF WATERING** Sprinkling is only permitted at residential, commercial and other non-agricultural properties as follows →	**EVEN numbered addresses:** Watering is only permitted on Tuesdays, Thursdays and Saturday's during the times described above. **ODD numbered addresses:** Watering is only permitted on Wednesday's, Friday's and Sunday's during the times described above.
Stage 1	**TWICE A WEEK WATERING** **Sprinkling is only permitted at residential, commercial and other non-agricultural properties as follows →**	**EVEN Numbered Addresses: Watering is only permitted on Saturdays and Tuesdays during the times described above.** **ODD Numbered Addresses: Watering is only permitted on Sundays and Wednesdays during the times described above.**
Stage 2	ONCE A WEEK WATERING Sprinkling is only permitted at residential, commercial and other non-agricultural properties as follows →	**EVEN numbered addresses:** Watering is only permitted on Saturdays during the times described above. **ODD numbered addresses:** Watering is only permitted on Sundays during the times described above.
Stage 3	**NO LAWN WATERING →**	• **NO sprinkling or irrigating any lawn or boulevard;** • **NO filling a swimming pool, hot tub, garden pond or decorative fountain at any time; or** • **NO washing a vehicle or a boat with water.**
Stage 4	Emergency – NO OUTDOOR WATERING →	**NO** person shall use water outdoors for any purpose.

***REFER TO THE COMPLETE BYLAW FOR FULL DETAILS**

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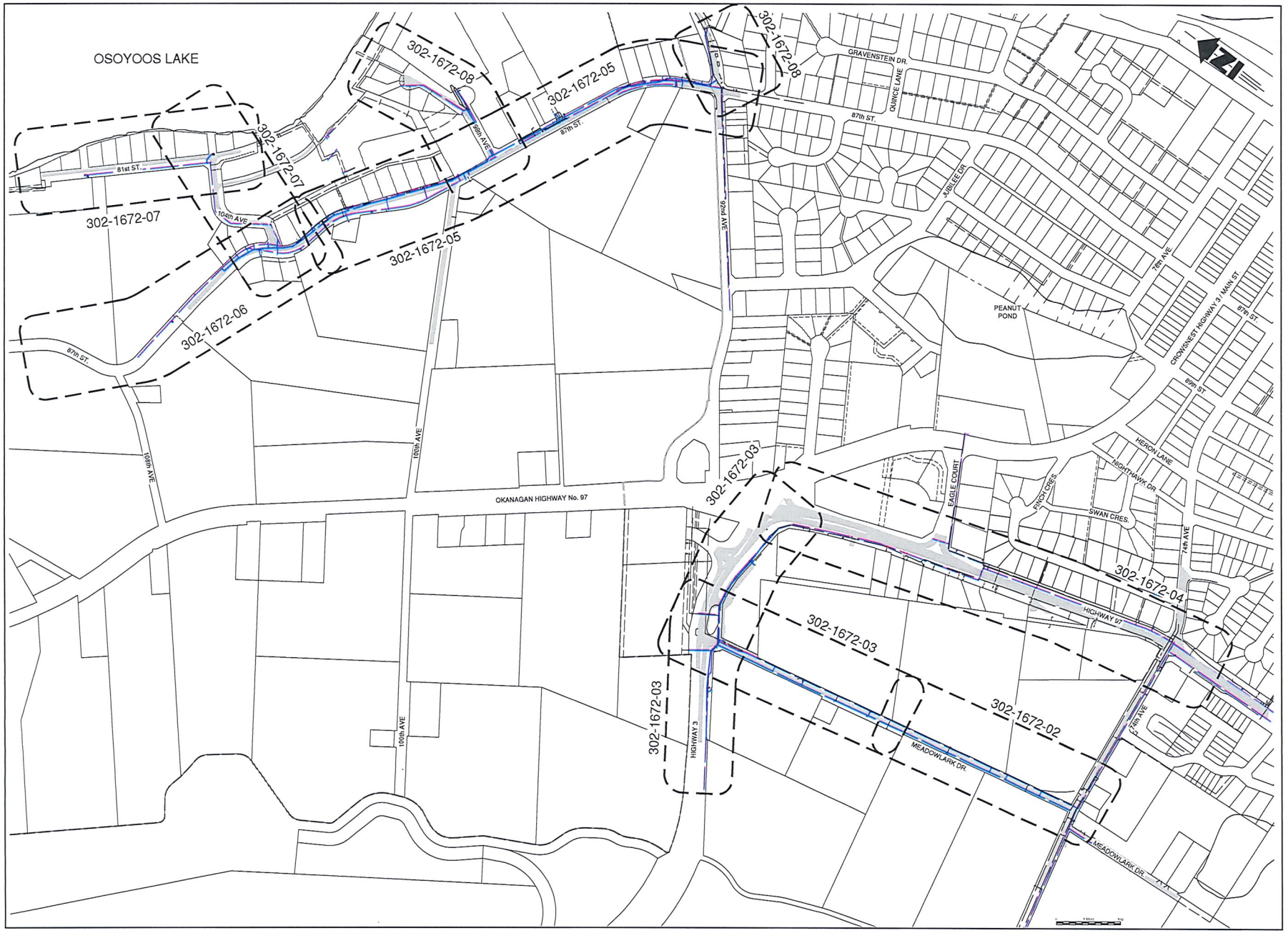
APPENDIX F

Illustrated Maps of System 8 Domestic Well Water



No.	DATE	ISSUED / REVISIONS	BY	APP'D
5	OCT. 2017	ISSUED FOR RECORD	CY	TMU
4	NOV. 7/16	REVISED ALIGNMENT, DETAILS AND TBL TO ELIMINATE PDP ISSUED FOR CONSTRUCTION	CL	TMU
3	OCT. 19/16	ISSUED FOR CONSTRUCTION	TT	TMU
2	OCT. 03/16	UNITS PRV DETAIL REVISED TO 6 No. REVISED TO 8 No.	CL	TMU
1	AUG. 24/16	ISSUED FOR 3RD & FINAL APPROVAL ISSUED FOR TENDER	CL	TMU

CONSULTANT SEAL

TRUE CONSULTING
201 - 2970 Falcon Road ● Kamloops BC ● V2C 4J2
tel 250.828.8881 ● fax 250.828.0717
info@TRUEJac.ca

Osoyoos
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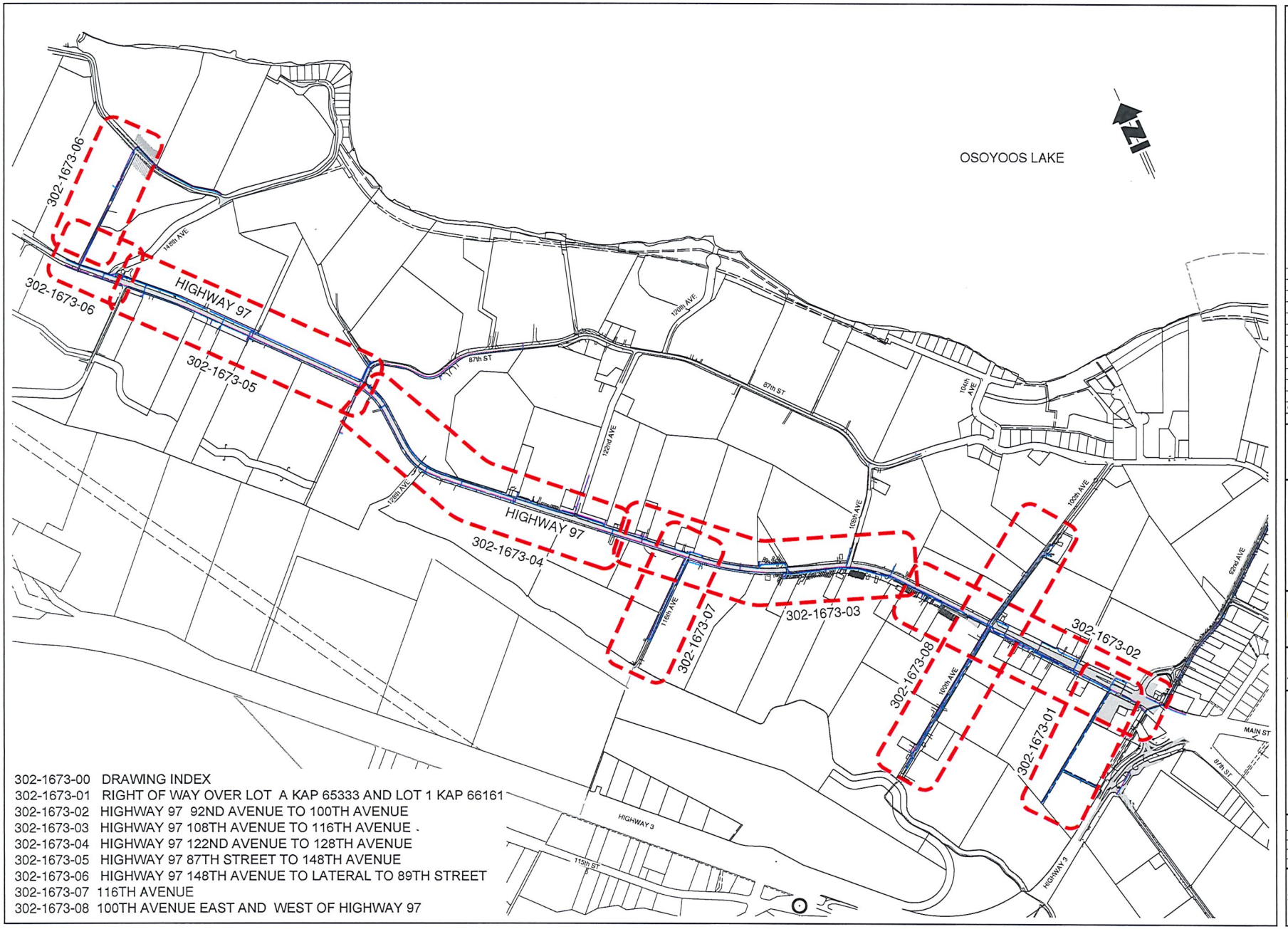
RURAL AREA WATER SYSTEM TWINNING - SYSTEM 8

PHASE 1 - CONTRACT 1

LOCATION AND KEY PLANS

SCALE	1:2500
DESIGN BY	TRU
DRAWN BY	DL
DATE	MAY, 2016
PROJECT REFERENCE No.	302-1672
DRAWING No.	302-1672-01
SHEET REVISION	5



302-1673-00 DRAWING INDEX
302-1673-01 RIGHT OF WAY OVER LOT A KAP 65333 AND LOT 1 KAP 66161
302-1673-02 HIGHWAY 97 92ND AVENUE TO 100TH AVENUE
302-1673-03 HIGHWAY 97 108TH AVENUE TO 116TH AVENUE
302-1673-04 HIGHWAY 97 122ND AVENUE TO 128TH AVENUE
302-1673-05 HIGHWAY 97 87TH STREET TO 148TH AVENUE
302-1673-06 HIGHWAY 97 148TH AVENUE TO LATERAL TO 89TH STREET
302-1673-07 116TH AVENUE
302-1673-08 100TH AVENUE EAST AND WEST OF HIGHWAY 97

LEGEND

POWER POLE
LIGHT STANDARD EXISTING
LIGHT STANDARD PROPOSED
LIGHT POST
POLE ANCHOR
JUNCTION BOX
IRON PIN
SURVEY HUB
TEST PIT
CURB STOP EXISTING
CURB STOP PROPOSED
PIT METER FLOW CURB STOP
VALVE EXISTING
VALVE PROPOSED
DRAIN EXISTING
AIR RELEASE VALVE EXISTING
AIR RELEASE VALVE PROPOSED
HYDRANT EXISTING
HYDRANT PROPOSED
STANDPIPE EXISTING
STANDPIPE PROPOSED
SERVICE DISCONNECTED
REDUCER
IRRIGATION BOX
IRRIGATION SERVICE EXISTING
GAP
STORM MANHOLE EXISTING
STORM MANHOLE PROPOSED
CATCHBASIN EXISTING
CATCHBASIN PROPOSED
STORM DRYWELL
CULVERT INLET
SANITARY MANHOLE EXISTING
SANITARY MANHOLE PROPOSED
CLEANOUT EXISTING
CLEANOUT PROPOSED
LIFT STATION EXISTING

No.	DATE	DESCRIPTION	BY	APP'D
4	OCT 2017	ISSUED FOR RECORD	CT	TRU
3	FEB 2017	ISSUED FOR CONSTRUCTION	DL	TRU
2	JAN 2017	ISSUED FOR TENDER	DL	TRU
1	JAN 27/17	ISSUED FOR PRELIMINARY APPROVALS	DL	TRU

ISSUES / REVISIONS

CONSULTANT SEAL

TRUE CONSULTING
201 - 2079 Falcon Road ■ Kamloops BC ■ V2C 4J2
tel 250.828.6881 ■ fax 250.828.0717
info@TRUE.bc.ca

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RURAL AREA WATER SYSTEM TWINNING - SYSTEM 8

PHASE 1 - CONTRACT 2
HIGHWAY 97
RIGHT OF WAY
HIGHWAY 3 TO 148TH AVENUE

DRAWING INDEX

SCALE	1:4000
DESIGN BY	TRU
DRAWN BY	DL
DATE	JAN 2017
PROJECT REFERENCE No.	302-1672
DRAWING No.	302-1673-00
SHEET	
REVISION	4