



2017 ANNUAL WATER QUALITY REPORT

WESTHILLS WATER SYSTEM

Operated by SSL-Sustainable Services Ltd.



Published: June 30, 2018



SSL-Sustainable Services Ltd. (SSL) is a provider of infrastructure services for the Westhills community in Langford, British Columbia. In partnership with the City of Langford, SSL was created to deliver water and, through its Community Energy System, thermal energy.

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Contents

Executive Summary

System Overview

System Upgrades

System Operation & Maintenance

Water Quality Monitoring

Conclusion

Appendices

Executive Summary

The purpose of this report is to fulfill the requirements set out in the British Columbia Drinking Water Protection Act (DWPA)¹ by publishing the results of water quality monitoring efforts, and also to provide a general overview of the Westhills Water System for the 2017 calendar year, including infrastructure upgrades, regular system operations, and maintenance programming.

The Westhills Water System was established in 2010, timed with the initial land development and construction of new homes in the Westhills community in Langford, B.C. Through efforts by both Westhills Land Corp and the City of Langford, the Capital Regional District (CRD) granted Langford the ability to provide water to Westhills residents. The system was operated on an interim basis by CRD Integrated Water Services until September 2010, at which point SSL took over as the operator of the water distribution system under contract with the City of Langford.

As the Westhills system does not maintain its own water source or undertake any water treatment, it was interpreted for several years as falling under the operating permit for the regional water system granted to the CRD by the Vancouver Island Health Authority (VIHA). Significant system expansion eventually led VIHA to issue a separate operating permit for the Westhills Water System (see Appendix 3). While the system was already in compliance with the base requirements set out in the BC Drinking Water Protection Act and Regulation, this permitting process formalizes our relationship with VIHA and provides an additional layer of important oversight for water quality matters.

This report will demonstrate that all water-related construction work, operating procedures, and water quality monitoring currently meet or exceed best practice, standards, and regulations set by the BC DWPA & DWPR, AWWA, VIHA, and the City of Langford.



Highlights of the Westhills Water System for 2017:

- 227,078 m³ of water delivered to the Westhills community;
- 122,854 m³ of water delivered to residential customers;
- 99,699 m³ of water delivered to public works, parks and commercial space;
- 62 microbiological tests, 12 turbidity tests and 12 heterotrophic plate count tests were completed, as well as 1 Full Spectrum Potability Analysis;
- Serviced 1 pressure relief valve (in-main);
- Maintained 84 fire hydrants to ensure reliable water is available during emergencies and for training purposes to Langford Fire Rescue;
- Zero leaks detected in water mains

¹ http://www.bclaws.ca/Recon/document/ID/freeside/00_01009_01

² <http://www.langford.ca/>

³ <http://www.WesthillsBC.com/>

⁴ <http://www.crd.bc.ca/>

System Overview

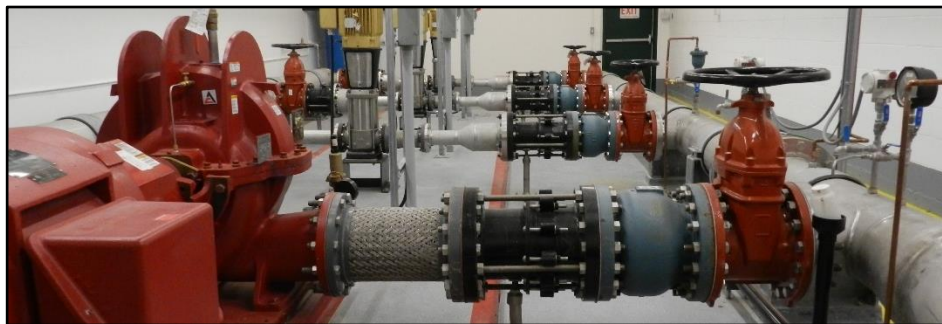
The main water supply for the Westhills Water System is the Sooke Lake Reservoir, which also supplies water to the majority of the Capital Regional District (CRD)⁵. This water source is managed by CRD Integrated Water Services, including all disinfection and treatment processes – notably UV sterilization and chloramination.



Sooke Lake Reservoir

The treated supply water then enters the Humpback Pressure Reducing Station located approximately two kilometers upstream from the Westhills Water System’s Booster Pump Station (BPS). Bulk water is metered inside the Westhills BPS, representing the demarcation point between the regional water system operated by the CRD and the Westhills Water System operated by SSL–Sustainable Services Ltd.

Water is then pumped through 3 high-efficiency variable speed pumps into a distribution system servicing 487 single family homes, 50 town homes, a 68-unit condominium as well as park and public irrigation and commercial end uses. An automatic fire pump within the BPS provides fire flows when needed. The BPS also includes a standby diesel generator for emergency conditions. Fuel supply for this generator is fed from a day tank, which is in turn fed from a larger underground storage tank. An annual overview of significant water system assets can be seen in Table 1.



Booster Pump Station

⁵ https://www.crd.bc.ca/docs/default-source/Partnerships-PDF/gvdwsa-school-tours/2014_iws_highschooltour_factsandfigures.pdf?sfvrsn=2

Source Water Map, 2017

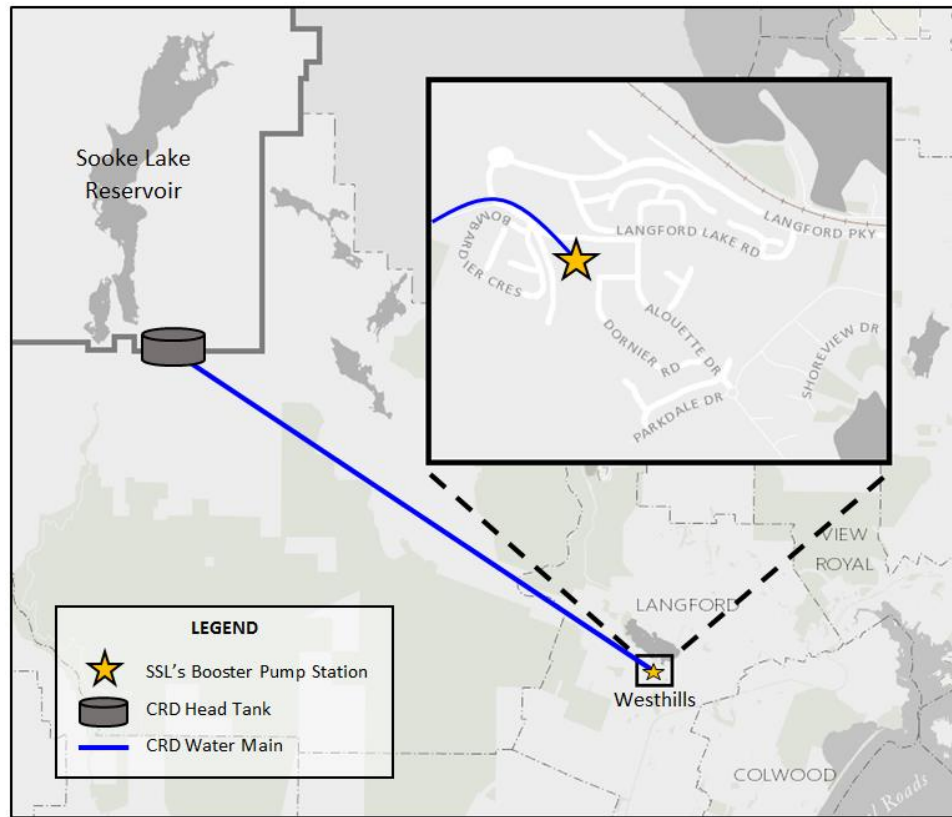
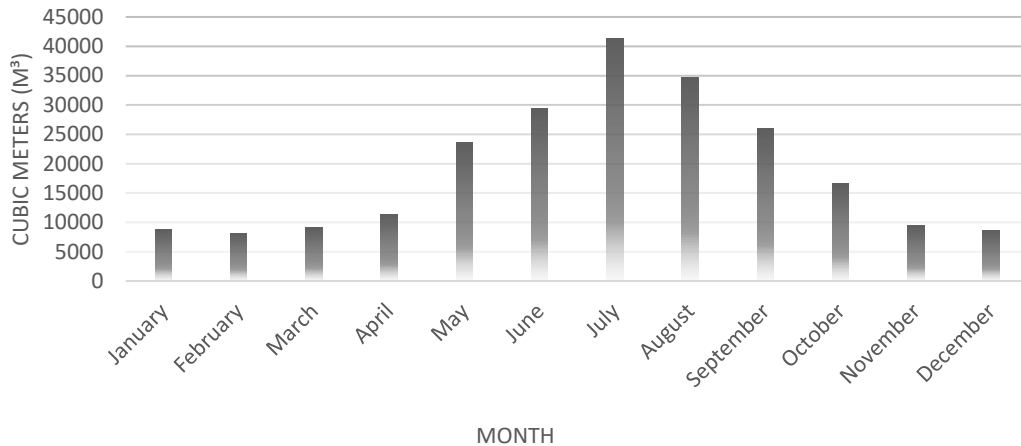


Table 1 – Overview of Westhills Water System

Water Assets	December 2014	December 2015	December 2016	December 2017
Hydrants	38	51	54	84
Pressure Relief Valve Chamber	1	1	1	1
Water Mains	5.96 km	7.09 km	8.02 km	11.5 km
Gate Valves	147	182	195	281
Flush Valves	19	23	21	47
Air Valves	6	7	7	9
Commercial Service Connections	3	5	5	7
Residential Service Connections	378	422	472	538
Households Served	630	688	756	858
Population Served	1,800 (est.)	1,912 (est.)	2,115 (est.)	2451 (est.)

Like many systems, overall water usage more than triples during the summer compared to average winter levels, as seen in the graph below. Most of this increase is associated with the use of irrigation systems. As Westhills is also an ongoing land development site, large amounts of water are used during the dry summer months for construction and dust control purposes.

2017 Water Consumption

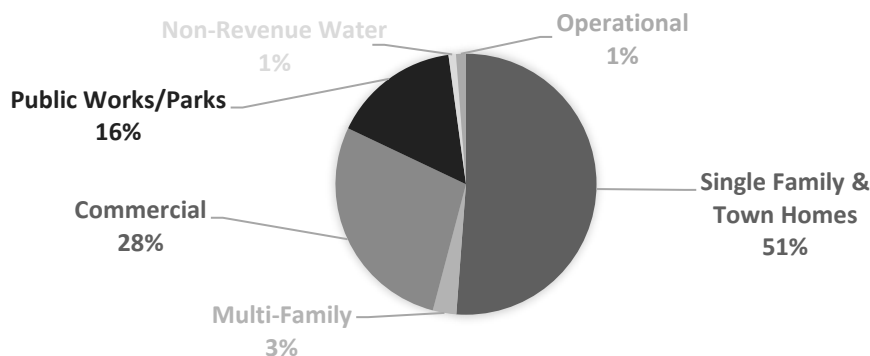


The graph below provides a breakdown by end use of all water provided in 2017. Through customer metering, SSL is able to track residential, commercial, parks and operational water usage, which accounts for most of the water that passes through the BPS. Any unidentified portion of the annual water total is classed as “non-revenue water,” including things like water leaks, error margins for estimated water billings, hydrant usage for fire department training and potentially water theft. In 2017, non-revenue water was 2,097 m³, or about 1% of total water usage in the system. This amount is significantly better than industry standards and is lower than the 2016 value of 3%.

Annual Water Usage Breakdown

	2014	2015	2016	2017
Single Family & Townhomes	64 %	57 %	49%	51%
Multi Family	5 %	4 %	3%	3%
Commercial	5 %	13 %	26%	28%
Public Works/Parks	18 %	22 %	18%	16%
Non-Revenue	6 %	1 %	3%	1%
Operational	2 %	2 %	2%	1%

Annual Comparison



System Upgrades

In 2017, the Westhills Water System was extended by adding 68 new residential or commercial water meters. Other new infrastructure included 86 gate valves, 30 fire hydrants and 3.48 km of new water mains.

Much of this growth is attributable to the West Shore Parkway road extension project, which was completed by the City of Langford in late 2017. This project represents a significant expansion to the existing Westhills Water System, including new water mains which now extend to large areas of previously underserved land to the south, near Sooke Road.



West Shore Parkway⁶

Two commercial water connections were completed in 2017, made possible by the completion of the West Shore Parkway extension project. The Peninsula Co-Op gas station and AMJ Campbell warehouse facility are the first projects in a wave of new development planned for the Glenshire Business Park area.



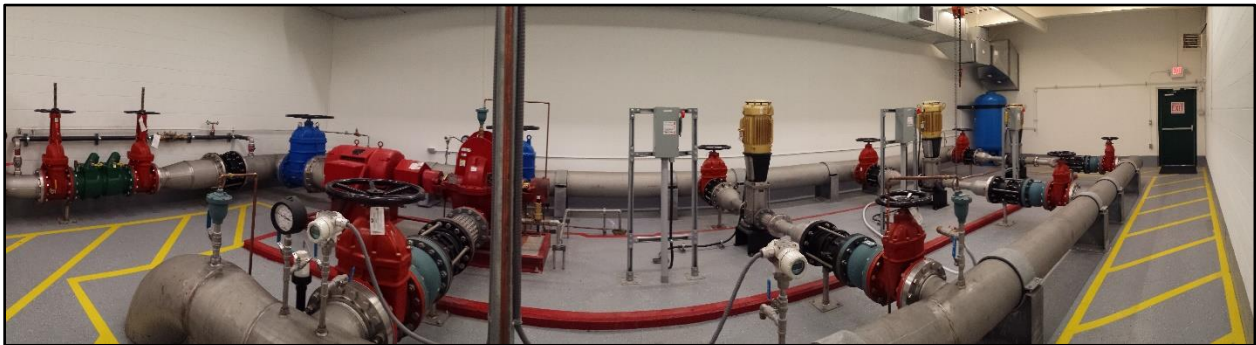
⁶ <http://www.timescolonist.com/news/local/new-route-opens-linking-sooke-road-and-langford-parkway-1.22261993>

System Operation & Maintenance

The Westhills Water System is operated by SSL and its team of engineers, civil contractors and certified plant operators to implement the O&M program below.

Monitoring: Booster Pump Station

- Weekly inspections of the BPS are carried out by a certified operator (EOCP Level III), with observations recorded in an on-site log book, including parameters like water temperature, total chlorine residual and pump run hours.
- SCADA/HMI System is remotely accessible from any computer connected to the internet and offers real time readings, trend logs and alarm tracking (authorized users only / protected by dual layer password protection).
- System Alarms are enunciated to a list of on-call personnel through an automated phone line system, which can operate without internet connectivity
- Live Video Cameras record any motion inside and outside the BPS, with both the live feed and recorded footage remotely accessible (authorized users only / protected by password and software registration)



Booster Pump Station

Maintenance: Booster Pump Station Equipment

- Fire pump: weekly inspection and 30-minute manual test run; annual inspection and cleaning of pump shaft cooling channels, packing glands and casing gaskets
- Booster pumps: weekly inspection and recording of run hours
- Diesel generator: weekly inspection and automated test run; annual full servicing which includes oil/filter change, readiness test and full load-banking (report filed on site and at SSL office)
- Pressure tank: annual inspection and servicing
- Backflow prevention devices: annual test by certified BFP tester (repair or replace as needed)
- Building electrical systems: annual inspection and report completed by FSR listed on Electrical Operating Permit
- Full hard copy sets of as-built and shop drawings are located at BPS, SSL head office, and with water system operator

Monitoring: Distribution System

- Water quality samples were regularly collected at the following minimum intervals:
 - WEEKLY: one bacteriological test for Total Coliform and E. Coli (CFU/100ml), along with total chlorine residual (ppm)
 - MONTHLY: one Turbidity test and one Heterotrophic Plate Count (HPC)
 - ANNUAL: Full spectrum VIHA potability analysis (bacteriological, metals, organics, etc.)



Maintenance: Distribution System

- Unidirectional flushing: Full system (annual); low-demand or dead-end sections (semi-annual / as needed)
- Fire hydrants: Pressure testing, painting, physical inspection and maintenance (annual); data reported to fire department, see Appendix 2.
- Valve exercising: Open/close all system valves to confirm operational; check all box covers and arrow painting (annual)
- Water meters: Physical inspection for leaks or bypasses; add mulch for frost protection (annual)



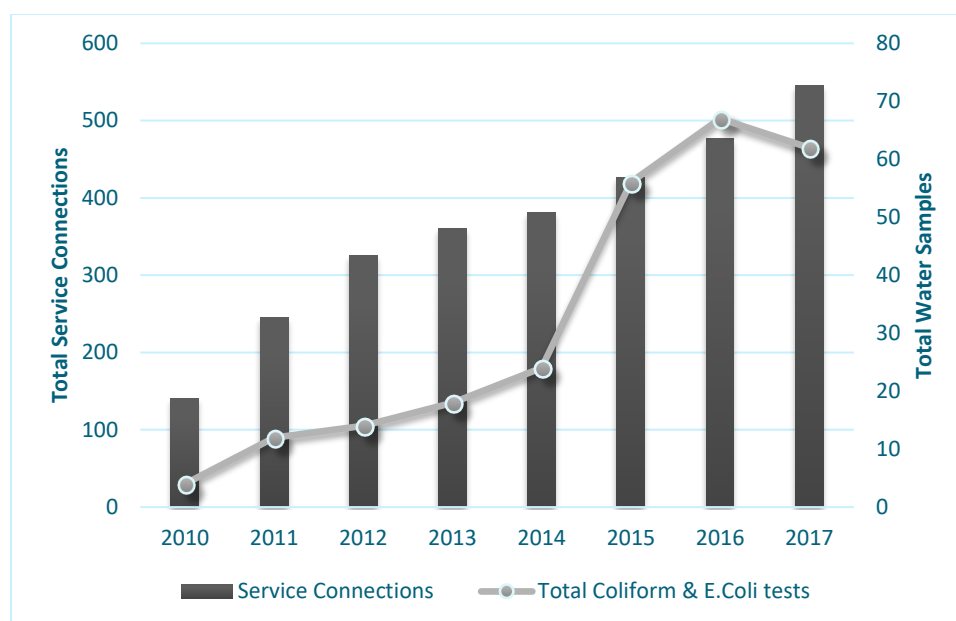
Unidirectional Flushing

Water Quality Monitoring

In 2017, SSL collected samples on a weekly basis at 7 dedicated sampling sites. These sites are evenly distributed throughout the Westhills Water System to give a good representation of water quality across the entire distribution network.

In 2017, 12 HPC, 12 Turbidity and 62 bacteriological samples for Total Coliform and E. Coli were collected. Sampling frequency has steadily increased over the years to keep up with the ongoing growth of the Westhills Water System and community, as seen in the graph below. All samples were sent for analysis at an accredited third-party laboratory, where tests were conducted in order to detect potentially harmful parameters in the water supply.

Number of Bacteriological Samples vs Service Connections



Total coliforms are a group of bacteria that are usually found on or in plants, soils, water, and in the intestines of humans and warm-blooded animals. Total coliforms can be used to help determine the efficacy of a drinking water treatment system⁷.

If total coliforms are detected in a water sample, the positive site(s) should be immediately resampled, which also helps to rule out human sampling error. If total coliforms are detected in consecutive samples, or more than 10% of samples collected in a given sampling period, further investigation is required. This investigation will be coordinated by SSL, involving the water system operator and project engineer as required, and may include flushing or disinfection of the supply system and sampling of adjacent sites. CRD Integrated Water Services and VIHA may also be notified in order to confirm results against the upstream regional supply data and/or initiate further actions if necessary.

⁷ Health Canada, Guidelines for Canadian Drinking Water Quality (2012)

Escherichia coli (*E. coli*) is a member of the coliform group of bacteria that are usually found in the intestines of humans and warm-blooded animals. It is not naturally found on or in other environments such as plants, soils and water. The presence of *E. coli* in a water sample is a good indicator of recent faecal contamination and can suggest a possible danger to public health⁶.

If *E. coli* is detected in a water sample, SSL will immediately notify the water system operator, project engineer and VIHA. The positive site(s) and adjacent sites will be immediately resampled and a boil water advisory may be issued (subject to direction from VIHA). If a consecutive sample is positive for *E. coli*, a boil water advisory will be issued and corrective actions undertaken in consultation with VIHA (see Appendix 4). CRD Integrated Water Services will also be notified.

Turbidity is the overall transparency of water caused by the presence of organic and inorganic particles, such as: decomposed plant and animal debris, microorganisms, clays, silts and metal precipitates⁶.

The maximum acceptable concentration for Turbidity is less than or equal to 1.0 NTU in 95% of the measurement or 95% of the time each month⁶. Turbidity should never exceed 3.0 NTU, in which case, further investigation is required. This investigation will be coordinated by SSL, involving the water system operator and project engineer as required. CRD Integrated Water Services will also be notified in order to confirm results against water system supply quality.

Heterotrophic Plate Count is used to provide an overall baseline of bacteriological activity within the drinking water system.

2017 Test Results

In 2017, 55 of the 62 bacteriological test results met the drinking water quality requirements for *E. coli* and total coliforms. In 7 samples, very low levels (between 1 and 2 CFU/100 mL) of total coliforms were detected (no *E. coli* detected). In each case, the site was immediately re-sampled with results confirming bacteriological results within acceptable limits, apart from one instance. In this case, an investigation was initiated involving the water system operator and system engineer. The subject site was re-sampled for a third time along with an additional site in the distribution system, all of which yielded acceptable bacteriological results. We suspect the sampling site in question may have been the problem, as it had recently been covered in landscaping materials and standing water. No samples in 2017 tested positive for *E. coli* bacteria and all 12 Turbidity samples were found to be within acceptable ranges and did not require further sampling or investigation. An overview of all water quality results from 2017 can be found in Table 2.

Table 2 – 2017 Water Quality Results

Sample Site	Sample Date	CL2 Res (ppm)	Total Coliforms (CFU/100mL)	E. coli (CFU/100mL)	Turbidity (NTU)	HPC	Temperature (°C)
Grob Crt	9-Jan-17	0.66, 0.61	<1	<1	0.1	<1	8, 8, 8
Dornier cul de sac	16-Jan-17	1.29, 1.35	<1	<1			7, 7, 8
3088 Dornier Rd	24-Jan-17	1.17, 1.16	<1	<1			4, 4, 5
Artesian cul de sac	30-Jan-17	1.38, 1.37	1	<1			3, 3, 5
Artesian cul de sac *	1-Feb-17	1.43, 1.29	<1	<1			6, 6, 6
Water Pump Station	8-Feb-17	1.43, 1.40	<1	<1	0.3	<1	4, 4, 4
Grob Crt	14-Feb-17	1.17, 1.07	<1	<1			8, 8, 8
Dornier cul de sac	20-Feb-17	1.52, 1.30	<1	<1			6, 6, 6
3088 Dornier Rd	28-Feb-17	1.20, 1.19	<1	<1			8, 8, 8
Artesian cul de sac	7-Mar-17	1.23, 1.18	<1	<1	0.3	1	6, 6, 6
Boeing & Bombardier	14-Mar-17	1.13, 1.07	<1	<1			8, 8, 8
Grob Crt	20-Mar-17	1.05, 1.07	<1	<1			8, 8, 8
Dornier cul de sac	28-Mar-17	1.23	<1	<1			7, 7, 7
Boeing & Bombardier	3-Apr-17	1.19, 1.26	1	<1 (1)	0.2		3, 7, 7
Boeing & Bombardier *	5-Apr-17	1.18, 1.11	0	<1 (1)			8, 8, 9
Water Pump Station	5-Apr-17	1.32	0	<1 (1)			8, 8, 9
Grob Crt	10-Apr-17	0.95, 0.88	0	0		1	9, 9, 9
3088 Dornier Rd	17-Apr-17	1.16, 1.06	0	0			12, 13, 13
Artesian cul de sac	25-Apr-17	1.13, 1.08	2	0			6, 6, 6
Artesian cul de sac	27-Apr-17	1.01, 0.94	0	0			7, 7, 6
Water Pump Station	27-Apr-17	N/A	0	0			7, 7, 6
Grob Crt	1-May-17	0.94, 0.97	0	0	0.3	<1	12, 14, 13
Dornier cul de sac	8-May-17	1.48, 1.39	0	0			10, 10, 10
3088 Dornier Rd	15-May-17	1.45, 1.42	1	0			9, 9, 9
3088 Dornier Rd *	17-May-17	1.03, 1.12	0	0			10, 10, 9
Artesian cul de sac	23-May-17	1.33, 1.33	0	0			16, 16, 16
Grob Crt	29-May-17	1.09, 1.01	2	0			12, 12, 11
Grob Crt *	31-May-17	1.11, 1.11	0	0			11, 11, 11
Dornier cul de sac	6-Jun-17	1.30, 1.29	0	0	0.3	1	15, 16, 15
3088 Dornier Rd	12-Jun-17	1.44, 1.56	0	0			13, 13, 13
Artesian cul de sac	19-Jun-17	1.11, 1.08	0	0			16, 16, 16
Grob Crt	26-Jun-17	1.11, 1.09	0	0			11, 12, 11
Dornier cul de sac	4-Jul-17	1.42, 1.31	1	0	0.5	14	11, 11, 11
Dornier cul de sac *	6-Jul-17	1.41, 1.44	1	0			14, 14, 14
3088 Dornier Rd	10-Jul-17	1.27, 1.26	0	0			9, 10, 15
Dornier cul de sac *	10-Jul-17	1.31, 1.34	0	0			9, 10, 15
Artesian cul de sac	18-Jul-17	1.32, 1.23	0	0			13, 13, 14
Grob Crt	26-Jul-17	1.75, 1.78	0	0			17, 16, 17
Water Pump Station	27-Jul-17	1.9	0	0			12, 17, 11

Boeing & Bombardier	27-Jul-17	1.5	0	0			12, 17, 11
Dornier cul de sac	27-Jul-17	2.0	0	0			12, 17, 11
3088 Dornier Rd	1-Aug-17	2.2, 2.2	0	0			19, 19, 22
Artesian cul de sac	8-Aug-17	1.88, 1.89	0	0	0.3	1	15, 12, 12
Grob Crt	14-Aug-17	1.48, 1.49	0	0			15, 15, 15
Dornier cul de sac	21-Aug-17	2.06, 1.94	0	0			14, 13, 13
Boeing & Bombardier	28-Aug-17	2.14, 2.16	0	0			23, 23, 23
3088 Dornier Rd	5-Sep-17	1.70, 1.70	0	0	0.3	<1	22, 23, 23
Artesian cul de sac	12-Sep-17	1.45, 1.39	0	0			15, 15, 15
Grob Crt	18-Sep-17	1.37, 1.26	0	0			20, 20, 19
Boeing & Bombardier	25-Sep-17	1.64, 1.51	0	0			10, 10, 10
Dornier cul de sac	3-Oct-17	1.85, 1.83	0	0	0.3	1	20, 21, 20
3088 Dornier Rd	10-Oct-17	1.55, 1.48	0	0			10, 10, 10
Artesian cul de sac	17-Oct-17	1.59, 1.70	0	0			15, 15, 15
Grob Crt	30-Oct-17	1.52, 1.55	0	0			16, 15, 15
Dornier cul de sac	1-Nov-17	1.75, 1.92	0	0	0.2	<1	13, 14, 15
Artesian cul de sac	15-Nov-17	1.58, 1.57	0	0			10, 9, 9
3088 Dornier Rd	20-Nov-17	1.91, 1.83	0	0			11, 11, 12
Grob Crt	27-Nov-17	1.55, 1.72	0	0			13, 12, 13
Boeing & Bombardier	5-Dec-17	1.58, 1.59	0	0			8, 8, 7
Dornier cul de sac	13-Dec-17	2.04, 2.02	0	0		<1	6, 6, 6
Artesian cul de sac	20-Dec-17	1.73, 1.79	0	0			9, 10, 13
Water Pump Station	20-Dec-17	1.94, 2.05	0	0	0.2		9, 10, 13

* Indicates a resample

2017 VIHA Potability Analysis

In addition to routine bacteriological testing, we also commission an annual “full spectrum” analysis of water in the Westhills distribution system. This analysis measures dozens of parameters which are impractical for routine testing, including metals, nutrients and various physical properties. While this is not required under the DWPA or our operating permit, we see value in the long-term maintenance of such records. The CRD also performs this analysis on the regional water source each year which allows us to make helpful comparisons between our distribution system and the primary water supply. The results of our 2017 analysis are included in Appendix 5.

2017 Water Quality Complaints

No water quality complaints were received by SSL from homes within Westhills in 2017.

Conclusion

In 2017, the Westhills Water System was operated and maintained in accordance with the requirements set out in the BC Drinking Water Protection Act. This would not be possible without the efforts of our core staff and an extended team of engineers, contractors, and operators. Their dedicated support is greatly appreciated by SSL and the wider public who enjoy daily access to reliable and safe drinking water.

For 2018, we are looking forward to continued development in the Westhills community. In particular, the Lakepoint One project, a mixed-use residential and commercial project, will be completed in the Spring. This project represents a significant expansion to the existing Water System in Westhills' emerging Lakepoint District. Furthermore, our booster pump station will undergo several upgrades in late-2018 as part of a phased infrastructure expansion project to support local growth. This will ultimately include the construction of a water storage reservoir which is tentatively scheduled to come online in late-2019.

Southern Vancouver Island is extremely fortunate to enjoy high-quality drinking water resources. This has largely been made possible through efforts by the CRD and VIHA, who we acknowledge as invaluable partners in the ongoing delivery of safe, clean water to our customers. We are proud of our role in providing a critical utility to the vibrant and growing community of Westhills and look forward to many years of continued service.



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Appendices

Appendix 1: SSL Water Main Book

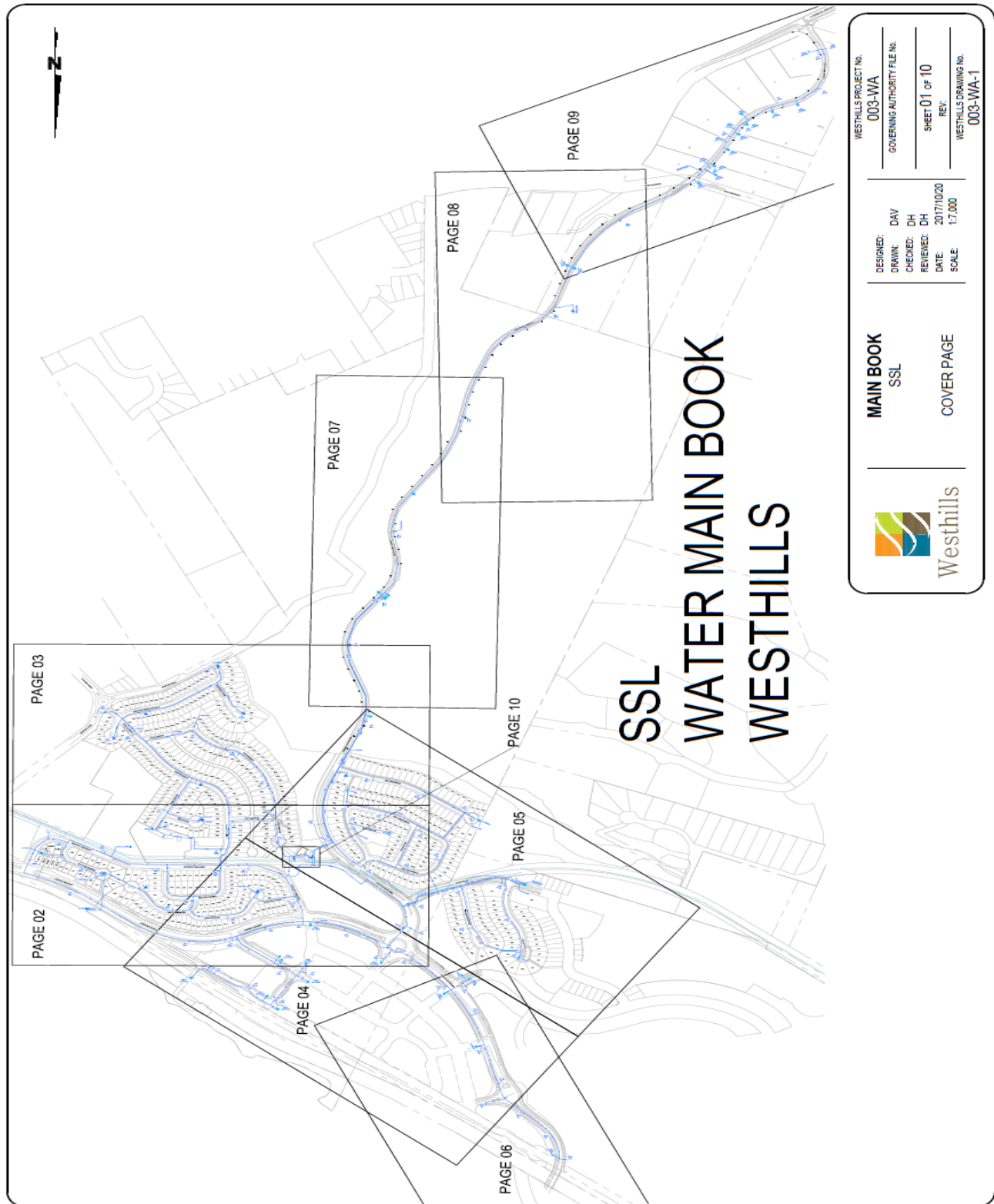
Appendix 2: Hydrant Maintenance Sheet

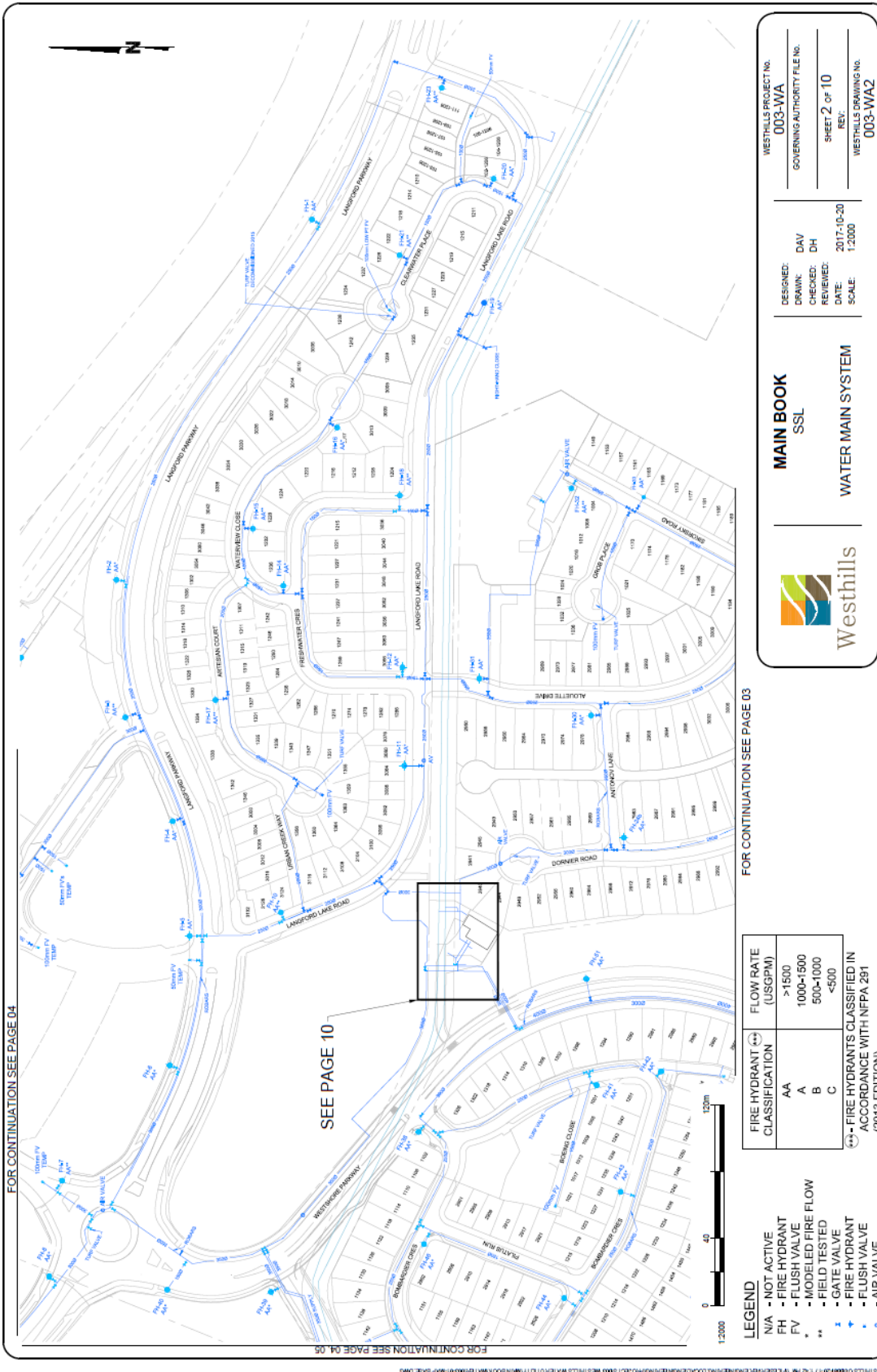
Appendix 3: VIHA Operating Permit

Appendix 4: Sample Drinking Water Quality Advisories

Appendix 5: Full Spectrum Potability Analysis

Appendix 1: SSL Water Main Book





WESTHILLS PROJECT NO.
003-WA

GOVERNING AUTHORITY FILE NO.
SHEET 2 OF 10

REV: 2017-10-20
SCALE: 1:2000

DESIGNED: DAV
DRAWN: DH
CHECKED: DH
REVIEWED: DH

MAIN BOOK
SSL

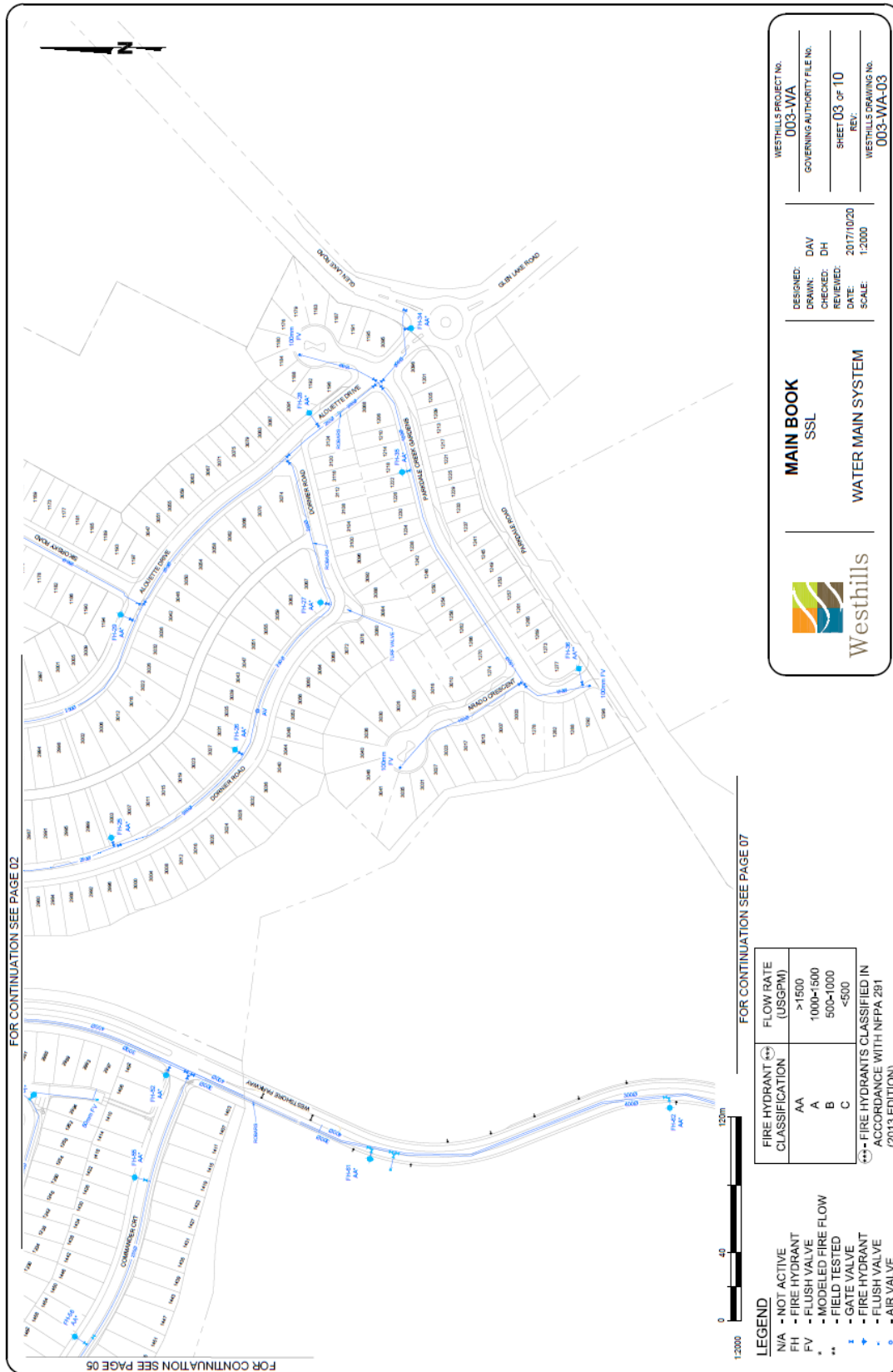
WATER MAIN SYSTEM

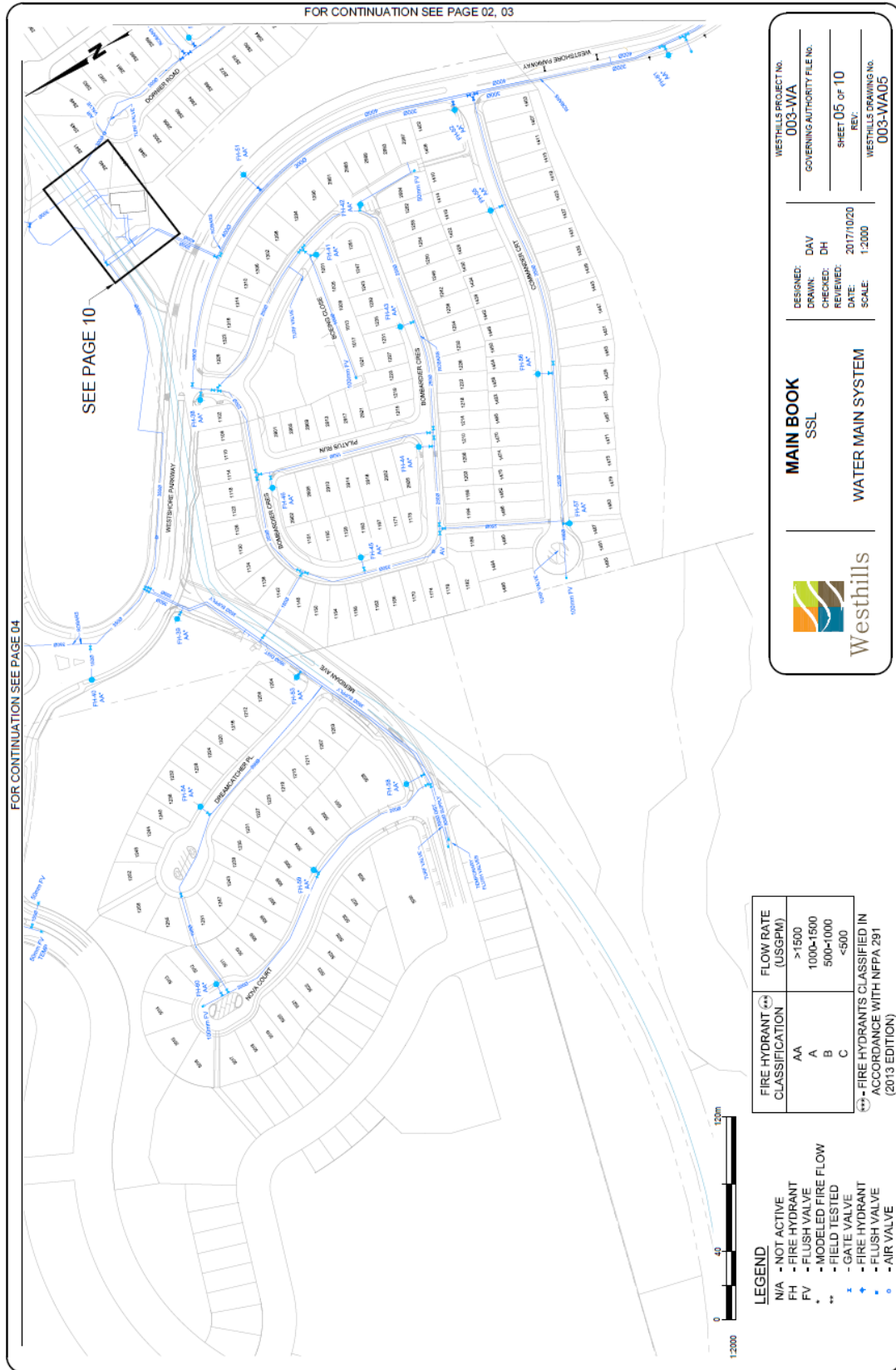
LEGEND

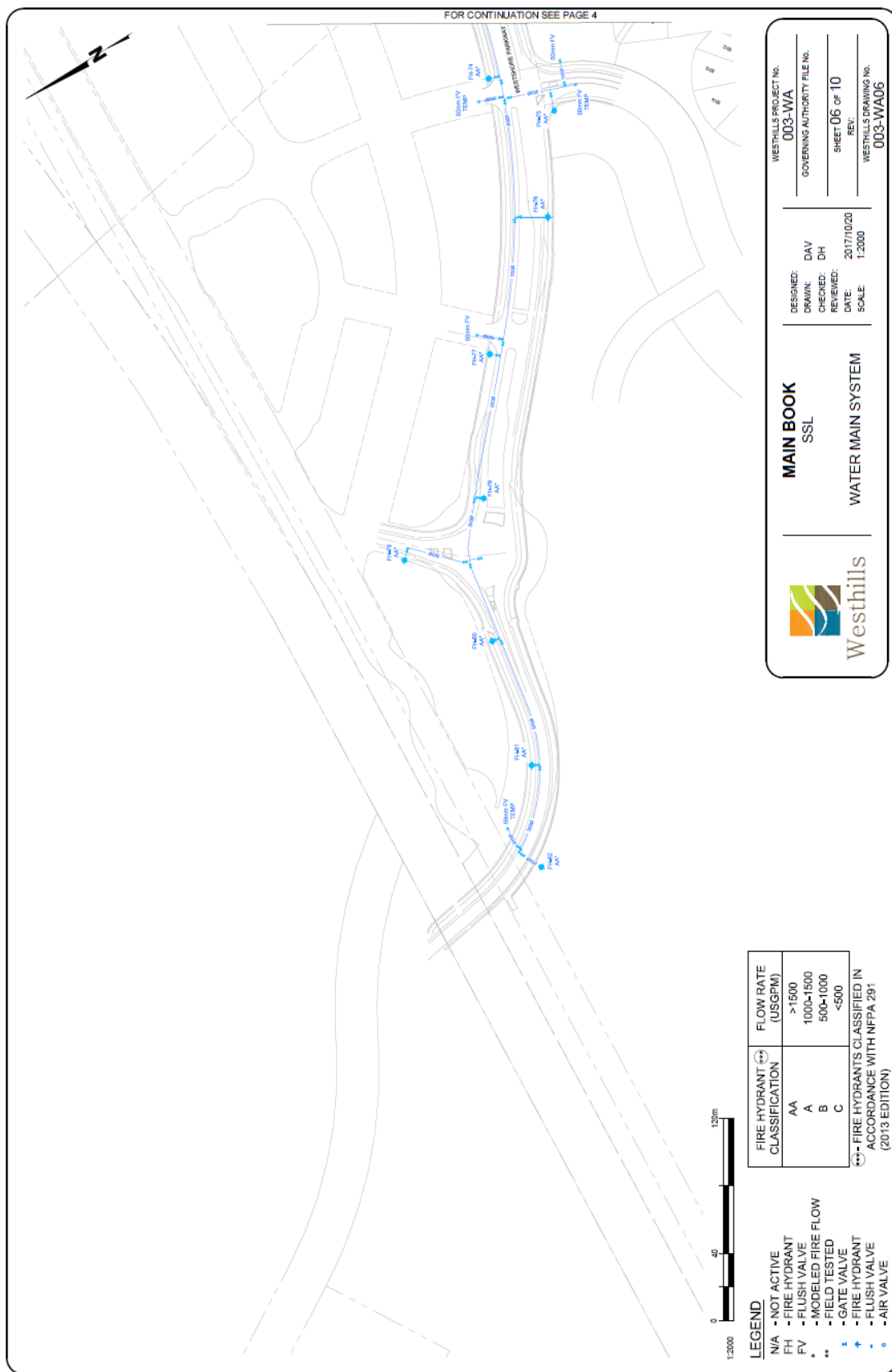
- N/A - NOT ACTIVE
- PH - FIRE HYDRANT
- FV - FLUSH VALVE
- ** - MODELED FIRE FLOW
- 1 - FIELD TESTED
- 2 - GATE VALVE
- 3 - FIRE HYDRANT
- 4 - FLUSH VALVE
- 5 - AIR VALVE

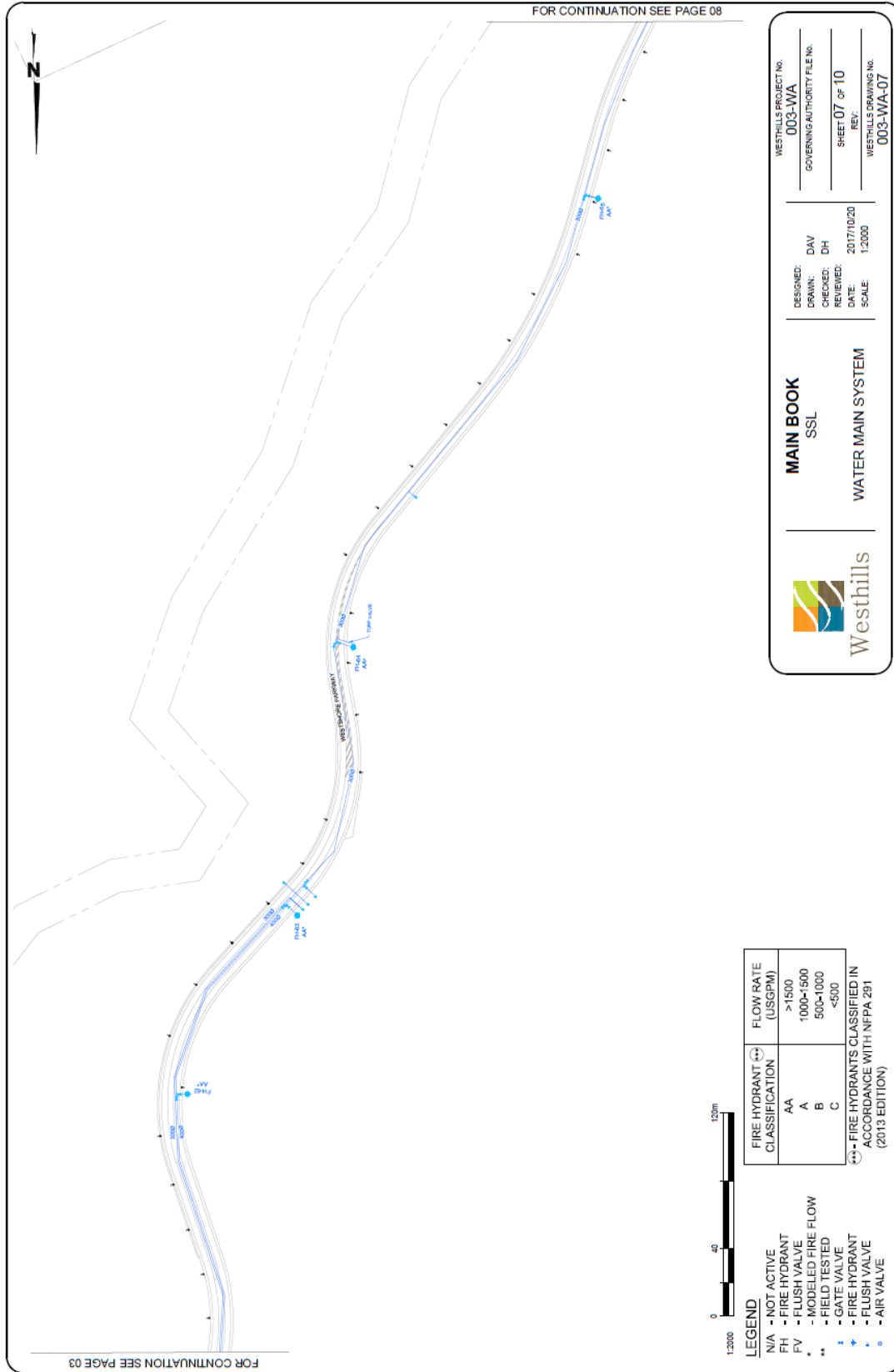
FIRE HYDRANT CLASSIFICATION	FLOW RATE (USGPM)
AA	>1500
A	1000-1500
B	500-1000
C	<500

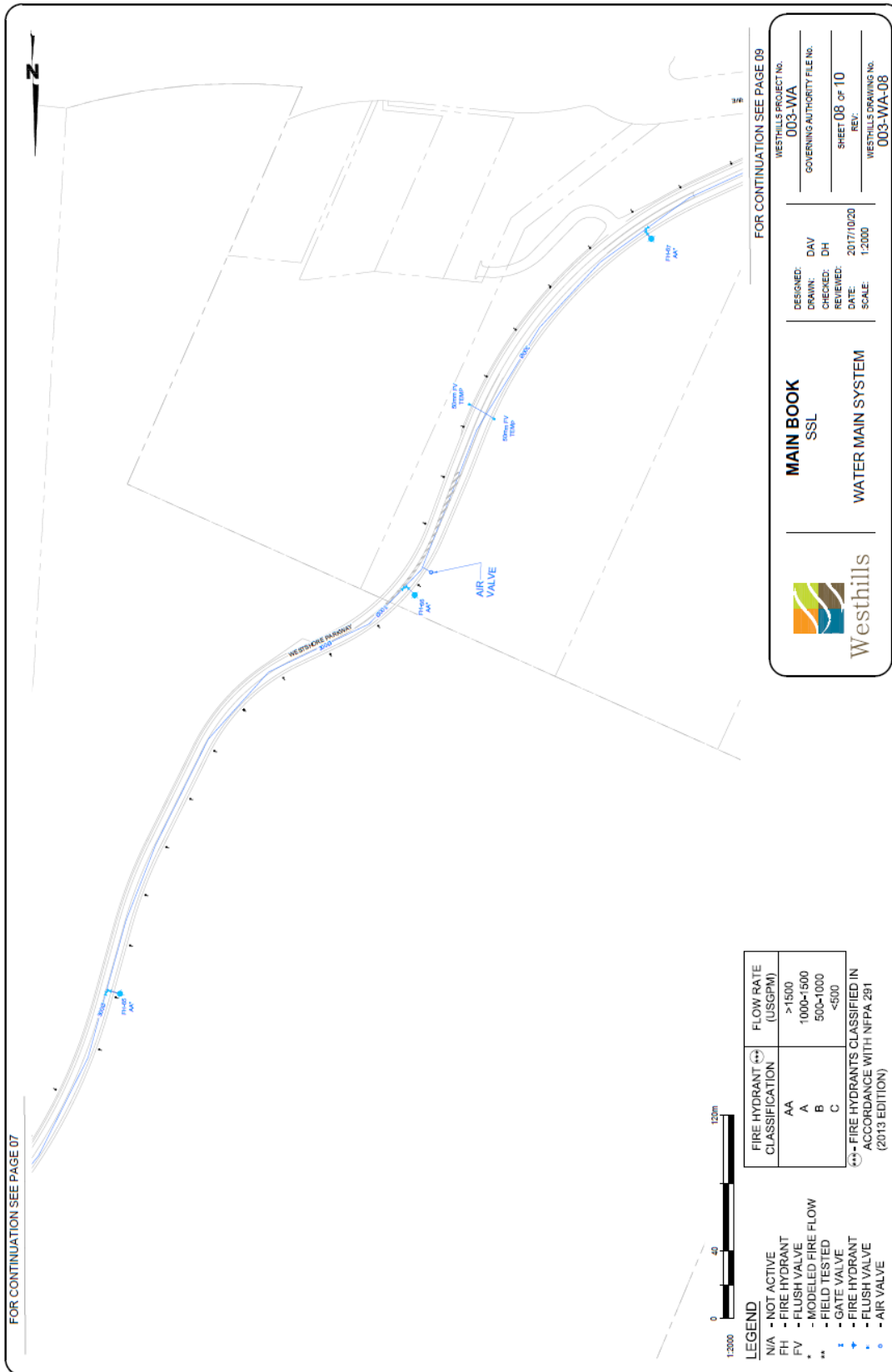
1-2-3-4-5 - FIRE HYDRANTS CLASSIFIED IN ACCORDANCE WITH NFPA 291 (2013 EDITION)

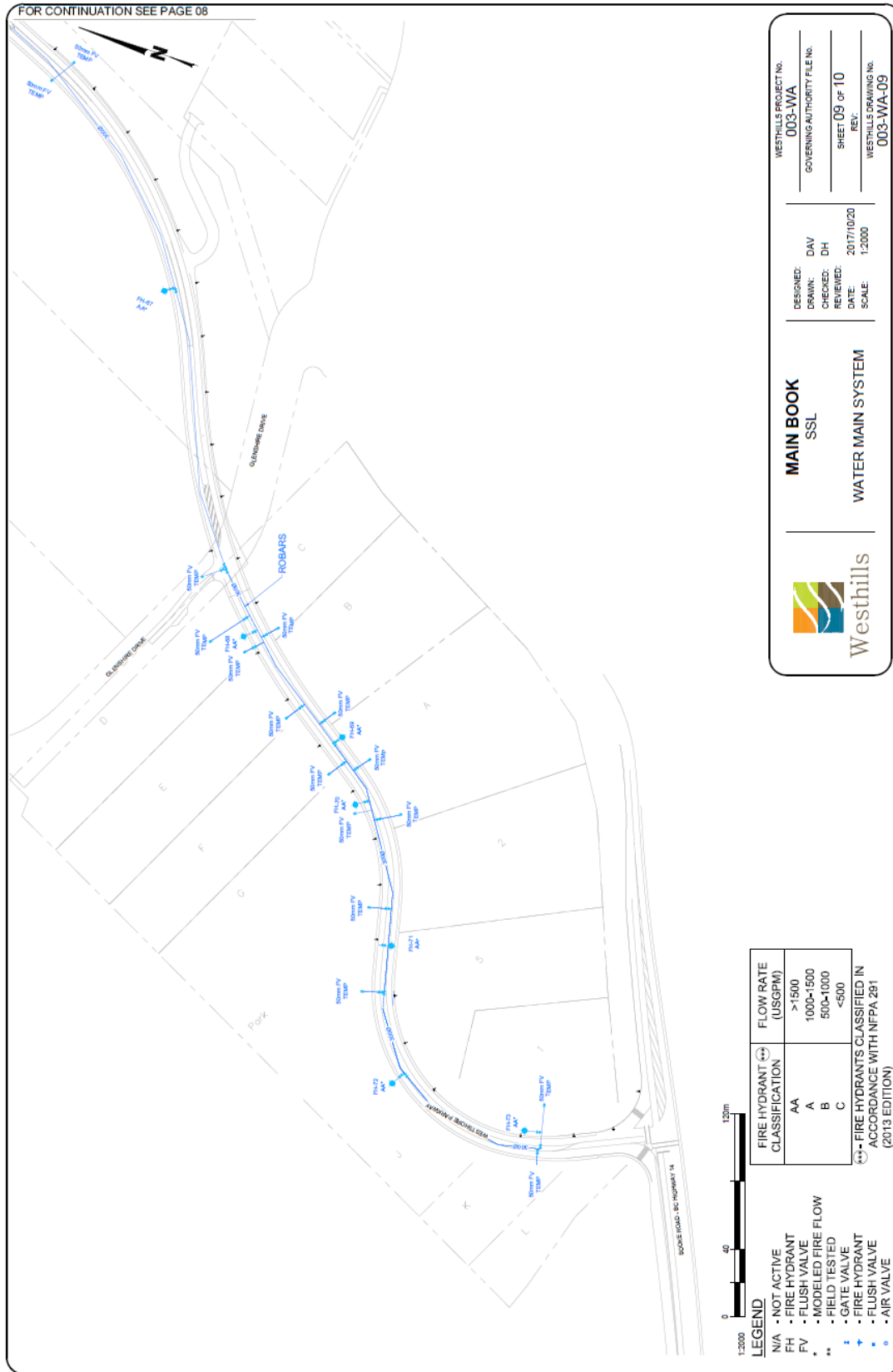


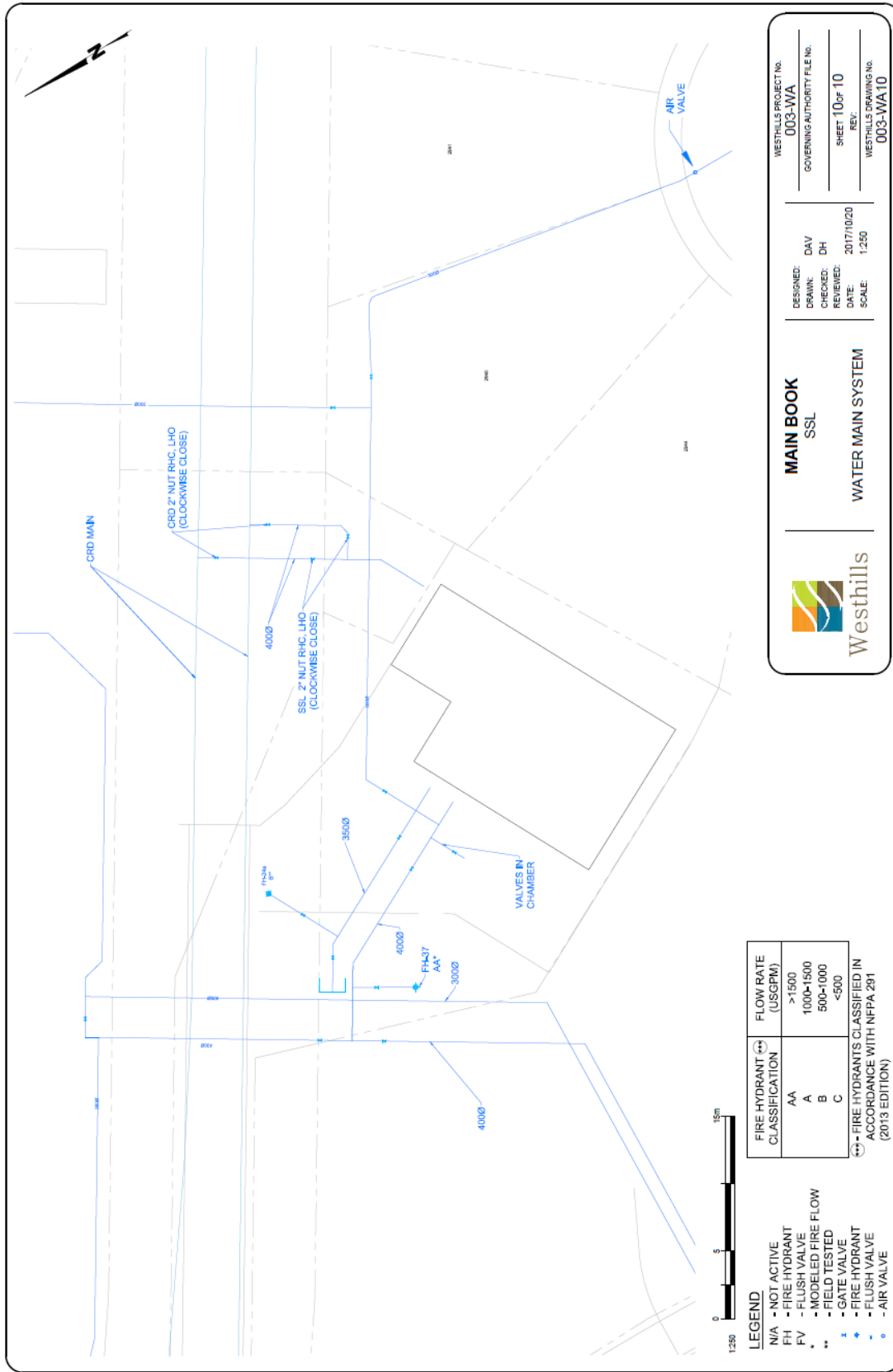















Westhills

MAIN BOOK

SSL

WATER MAIN SYSTEM

DESIGNED: DAV

DRAWN: DH

CHECKED: DH

REVIEWED: 2017/10/20

DATE: 1:250

WESTHILLS PROJECT No. 003-WA

GOVERNING AUTHORITY FILE No. SHEET 10 of 10

REV. REV. 003-WA10

FIRE HYDRANT CLASSIFICATION	FLOW RATE (USGPM)
AA	>1500
A	1000-1500
B	500-1000
C	<500

(AA) = FIRE HYDRANTS CLASSIFIED IN ACCORDANCE WITH NFPA 291 (2013 EDITION)

- LEGEND**
- N/A - NOT ACTIVE
 - FH - FIRE HYDRANT
 - FV - FLUSH VALVE
 - MV - MODELED FIRE FLOW
 - - FIELD TESTED
 - - GATE VALVE
 - - FIRE HYDRANT
 - - FLUSH VALVE
 - - AIR VALVE

Appendix 2: Hydrant Maintenance Sheet

Hydrant #	Pressure (psi)	Requires Paint? (Y or N)	Notes
PH #1	109	N	Being painted by others
PH #2	92	N	Being painted by others
PH #3	88	Y	
PH #4	84	Y	
PH #5	79	Y	
PH #6	79	Y	
PH #7	79	Y	
PH #8	0 *in use	Y	Cap was missing, replaced cap.
PH #9	92-98	Y	Slight leak at flange gasket. Pressure moving between 90-100 psi with main valve closed.
PH #10	80	Y	
PH #11	62	Y	
PH #12	72	Y	
PH #14	82	Y	
PH #15	88	Y	
PH #16	95	Y	
PH #17	74	Y	
PH #18	78	Y	
PH #19	92	Y	
PH #20	102	Y	
PH #21	106	Y	
PH #23	112	Y	
PH #24A	34	Y	
PH #24B	35	Y	
PH #25	75	Y	
PH #26	74	Y	
PH #27	80	Y	
PH #28	90	Y	
PH #29	72	Y	
PH #30	70	Y	
PH #31	70	Y	

PH #32	56	Y	
PH #33	62	Y	
PH #34	0	Y	Held no pressure when main closed. Held at 90 psi (12 min test).
PH #35	98	Y	
PH #36	102	Y	
PH #37	80	Y	
PH #38	70-80	Y	Fluctuating between 70-80. Main closed. No fluctuation, holding at 71 psi.
PH #39	71	Y	
PH #40	76	Y	
PH #41	70	Y	
PH #42	68	Y	
PH #43	62	Y	
PH #44	55	Y	
PH #45	53	Y	
PH #46	68	Y	
PH #47	96	Y	
PH #48	0	Y	Big leak at flange gasket also at main stem. Fixed leak (tightened bolts).
PH #49	100	Y	
PH #50	110	Y	Slight fluctuation between 104-110 with main valve off. New rubber no fluctuation holding at 110 psi.
PH# 51	78	Y	
PH #51	86	Y	
PH #52	70	Y	
PH #53	67	Y	
PH #54	78	Y	
PH# 52	66	Y	
PH #55	66	Y	
PH #56			
PH #57			
PH #58			
PH# 53			
PH #59			
PH #60			

Appendix 3: VIHA Operating Permit



Health Protection Environment
201-771 Vernon Avenue
Victoria BC V8X 5A7



May 8, 2017

WESTHILLS WATER SYSTEM
SSL-SUSTAINABLE SERVICES LTD.
204-957 LANGFORD PARKWAY
VICTORIA BC V9B 0A5

Dear Operator:

Health Operating Permit April 01st, 2017 to March 31st, 2018

S3049

WESTHILLS WATER SYSTEM - 64010259

Enclosed please find your April 2017 – March 2018 validation decal # 3150 for your facility.

This decal should be affixed to your Permit to Operate and displayed in a conspicuous place and is not transferable.

If your facility has been sold or closed, please advise your local Environmental Health office and return the permit/decal to the appropriate office.

Please contact Finance at 250-755-7691 ext 53109 for billing inquiries or your local EHO office at the number below for non-billing queries.

Thank you,

Health Protection Environment Services

Victoria EHO
Gateway Village Hlth Unit
201 771 Vernon Ave
Victoria, B.C.
V8X 5A7
(250) 519-3401

Nanaimo EHO
3rd Floor,
6475 Metral Dr.
Nanaimo, B.C.
V9T 2L9
(250) 755-6215

Duncan EHO
4th Floor
238 Government St
Duncan, B.C.
V9L 1A5
(250) 737-2010

Campbell River EHO
200-1100 Island Hwy
Campbell River, BC
V9W 8C6
(250) 850-2110

Port Alberni EHO
4227 6th Ave
Port Alberni, B.C.
V9Y 4N1
(250) 731-1315

Parksville EHO
OHC 489 Alberni Hwy
Parksville, B.C.
V9P 1J9
(250) 947-8222

Port Hardy EHO
7070 Market St
Port Hardy, B.C.
V0N 2P0
(250) 902-6071

Courtenay EHO
355 11th St.
Courtenay, B.C.
V9N 1S4
(250) 331-8518

Appendix 4: Sample Drinking Water Quality Advisory

BOIL WATER NOTICE

SSL-Sustainable Services Ltd. (SSL), in consultation with the Vancouver Island Health Authority (VIHA), has issued a BOIL WATER NOTICE for the Westhills Water Distribution System. This Notice is effective immediately and covers all residents of Westhills and those who obtain water from the Westhills Water Distribution System (Facility #1948)

Until further notice, water from the Westhills Water Distribution System should be held at a rolling boil for one (1) minute and cooled before it is consumed. For your safety, only boiled or bottled water should be used for drinking, making ice or fountain drinks, washing dishes, brushing teeth, or preparing foods that will not be cooked.

The following checked statement best describes the situation that triggered this notice:

- Recent water test show the presence of unacceptable levels of bacteria. Boiling the water will make it safe to drink.
- Turbidity in the water system has risen to unacceptable levels as a result of _____. High turbidity can interfere with disinfection and may signal the presence of disease causing organisms. Boiling the water will make it safe to drink.
- The water system recently experienced a _____, which may make the water unsafe to drink. Boiling the water will make it safe to drink.

SSL and VIHA are working together to resolve the situation. Once the water is safe to drink, this Boil Water Notice will be rescinded.

Updates will be provided regularly to Westhills residents' _____ as well as by postings in locations throughout the community and online at www.SSL-BC.com. Updates can also be obtained by contacting one of:

SSL-Sustainable Services Ltd. – 250-391-7260
Island Flow Control Water Solutions Ltd. – 250-361-5503

The Vancouver Island Health Authority has additional information about boil water notices online at http://www.viha.ca/mho/water/boil_water

Thank you for your patience and cooperation. For further information, please contact:

Name:
Phone:
Email:
Date:

DO NOT USE WATER

SSL-Sustainable Services Ltd. (SSL), in consultation with the Vancouver Island Health Authority (VIHA), has issued a DO NOT USE WATER Notice for the Westhills Water Distribution System. This Notice is effective immediately and covers all residents of Westhills and those who obtain water from the Westhills Water Distribution System (Facility #1948)

*Until further notice, do not drink or use water from the Westhills Water Distribution System.
Boiling the water will not make it safe to drink.*

The following statement best describes the situation that triggered this notice:

SSL and VIHA are working together to resolve the situation. Once the water is safe to drink, this DO NOT USE WATER Notice will be rescinded.

Updates will be provided regularly to Westhills residents _____ as well as by postings in locations throughout the community and online at www.SSL-BC.com. Updates can also be obtained by contacting one of:

SSL-Sustainable Services Ltd. – 250-391-7260
Island Flow Control Water Solutions Ltd. – 250-361-5503

Thank you for your patience and cooperation. For further information, please contact:

Name:
Phone:
Email:
Date:

Appendix 5: Full Spectrum Potability Analysis

RDL = Reportable Detection Limit

N/A = Not Applicable

Criteria A = Maximum Acceptable Concentration (MAC)

Criteria B = Aesthetic Objectives (AO)

Criteria C = Operational Guidance Values (OG)

RESULTS OF CHEMICAL ANALYSES OF DRINKING WATER

Maxxam ID					SG4585		
Sampling Date					2017-10-19 12:10		
COC Number					WI008978		
	UNITS	MAC	AO	OG	PUMPSTATION	RDL	QC Batch
ANIONS							
Nitrite (N)	mg/L	1	-	-	<0.0050	0.0050	8802613
Calculated Parameters							
Total Hardness (CaCO ₃)	mg/L	-	-	-	17.3	0.50	8800241
Nitrate (N)	mg/L	10	-	-	<0.020	0.020	8799322
Misc. Inorganics							
Fluoride (F)	mg/L	1.5	-	-	<0.020	0.020	8801834
Alkalinity (Total as CaCO ₃)	mg/L	-	-	-	14.1	1.0	8802415
Total Organic Carbon (C)	mg/L	-	-	-	2.09	0.50	8805167
Alkalinity (PP as CaCO ₃)	mg/L	-	-	-	<1.0	1.0	8802415
Bicarbonate (HCO ₃)	mg/L	-	-	-	17.2	1.0	8802415
Carbonate (CO ₃)	mg/L	-	-	-	<1.0	1.0	8802415
Hydroxide (OH)	mg/L	-	-	-	<1.0	1.0	8802415
Anions							
Dissolved Sulphate (SO ₄)	mg/L	-	500	-	1.5	1.0	8804333
Dissolved Chloride (Cl)	mg/L	-	250	-	4.1	1.0	8804327
MISCELLANEOUS							
True Colour	Col. Unit	-	15	-	<5	5	8801812
Nutrients							
Total Organic Nitrogen (N)	mg/L	-	-	-	0.182	0.020	8800252
Total Ammonia (N)	mg/L	-	-	-	0.35	0.020	8805356
Nitrate plus Nitrite (N)	mg/L	-	-	-	<0.020	0.020	8802612
Total Nitrogen (N)	mg/L	-	-	-	0.535	0.020	8806618
Physical Properties							

Conductivity	uS/cm	-	-	-	47.9	2.0	8802414
pH	pH	-	7.0:10.5	-	7.44		8802413
Physical Properties							
Total Dissolved Solids	mg/L	-	500	-	23	10	8801823
Turbidity	NTU	see remark	see remark	see remark	0.3	0.1	8801831

MERCURY BY COLD VAPOR (DRINKING WATER)

Maxxam ID			SG4585		
Sampling Date			2017-10-19 12:10		
COC Number			WI008978		
	UNITS	MAC	PUMPSTATION	RDL	QC Batch
Elements					
Total Mercury (Hg)	ug/L	1	<0.010	0.010	8804789

ELEMENTS BY ATOMIC SPECTROSCOPY (DRINKING WATER)

Maxxam ID					SG4585		
Sampling Date					2017-10-19 12:10		
COC Number					WI008978		
	UNITS	MAC	AO	OG	PUMPSTATION	RDL	QC Batch
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	-	-	100	8.3	3.0	8803472
Total Antimony (Sb)	ug/L	6	-	-	<0.50	0.50	8803472
Total Arsenic (As)	ug/L	10	-	-	<0.10	0.10	8803472
Total Barium (Ba)	ug/L	1000	-	-	4.1	1.0	8803472
Total Beryllium (Be)	ug/L	-	-	-	<0.10	0.10	8803472
Total Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	8803472
Total Boron (B)	ug/L	5000	-	-	<50	50	8803472
Total Cadmium (Cd)	ug/L	5	-	-	<0.010	0.010	8803472
Total Chromium (Cr)	ug/L	50	-	-	<1.0	1.0	8803472
Total Cobalt (Co)	ug/L	-	-	-	<0.20	0.20	8803472
Total Copper (Cu)	ug/L	-	1000	-	1.38	0.20	8803472
Total Iron (Fe)	ug/L	-	300	-	25.5	5.0	8803472
Total Lead (Pb)	ug/L	10	-	-	<0.20	0.20	8803472
Total Manganese (Mn)	ug/L	-	50	-	6.5	1.0	8803472
Total Molybdenum (Mo)	ug/L	-	-	-	<1.0	1.0	8803472
Total Nickel (Ni)	ug/L	-	-	-	<1.0	1.0	8803472
Total Selenium (Se)	ug/L	50	-	-	<0.10	0.10	8803472
Total Silicon (Si)	ug/L	-	-	-	2080	100	8803472
Total Silver (Ag)	ug/L	-	-	-	<0.020	0.020	8803472

Total Strontium (Sr)	ug/L	-	-	-	16.5	1.0	8803472
Total Thallium (Tl)	ug/L	-	-	-	<0.010	0.010	8803472
Total Tin (Sn)	ug/L	-	-	-	<5.0	5.0	8803472
Total Titanium (Ti)	ug/L	-	-	-	<5.0	5.0	8803472
Total Uranium (U)	ug/L	20	-	-	<0.10	0.10	8803472
Total Vanadium (V)	ug/L	-	-	-	<5.0	5.0	8803472
Total Zinc (Zn)	ug/L	-	5000	-	<5.0	5.0	8803472
Total Zirconium (Zr)	ug/L	-	-	-	<0.10	0.10	8803472
Total Calcium (Ca)	mg/L	-	-	-	5.01	0.050	8799441
Total Magnesium (Mg)	mg/L	-	-	-	1.16	0.050	8799441
Total Potassium (K)	mg/L	-	-	-	0.133	0.050	8799441
Total Sodium (Na)	mg/L	-	200	-	1.69	0.050	8799441
Total Sulphur (S)	mg/L	-	-	-	<3.0	3.0	8799441

MICROBIOLOGY (DRINKING WATER)

Maxxam ID			SG4585		
Sampling Date			2017-10-19 12:10		
COC Number			WI008978		
	UNITS	MAC	PUMPSTATION	RDL	QC Batch
Microbiological Param.					
Heterotrophic Plate Count	CFU/mL	-	<1	1	8803910
Iron Bacteria	CFU/mL	-	2200	25	8814212
Sulphate reducing bacteria	CFU/mL	-	<75	75	8814222
Total Coliforms	CFU/100mL	0	0	N/A	8801811
E. coli	CFU/100mL	0	0	N/A	8801811

CALCULATED PARAMETERS (DRINKING WATER)

Maxxam ID		SG4585	
Sampling Date		2017-10-19 12:10	
COC Number		WI008978	
	UNITS	PUMPSTATION	QC Batch
Parameter			
Langelier Index (@ 4.4C)	N/A	-2.55	8800253
Langelier Index (@ 60C)	N/A	-1.50	8800254
Saturation pH (@ 4.4C)	N/A	9.99	8800253
Saturation pH (@ 60C)	N/A	8.94	8800254

MISCELLANEOUS (DRINKING WATER)

Maxxam ID			SG4585		
Sampling Date			2017-10-19 12:10		
COC Number			WI008978		
	UNITS	AO	PUMPSTATION	RDL	QC Batch
MISCELLANEOUS					
Total Sulphide	mg/L	0.05	0.0140	0.0050	8800725