



Making a difference...together

FULFORD WATER SERVICE COMMISSION SPECIAL MEETING

Notice of Meeting on Tuesday, November 2, 2021 at 12:00 PM
Fulford Community Hall, 2591 Fulford-Ganges Rd, Salt Spring Island, BC

Gary Holman

Anthony Maude

Carole Eyles

Gord Singbeil

Alan Martin

(r) regrets

AGENDA

1. Territorial Acknowledgement / Call Meeting to Order

2. Limited Space Meeting Resolution

That this resolution applies to the Fulford Water Service Commission for the meeting being held on November 2, 2021, and that the attendance of the public at the place of the meeting will be limited in accordance with the applicable requirements or recommendations under the Public Health Act, despite the best efforts of the Commission because:

- a. The available meeting facilities cannot accommodate more than (175) people in person, including members of the Commission and staff, and
- b. There are no other facilities presently available that will allow physical attendance of the Commission and the public in sufficient numbers; and

That the Commission is ensuring openness, transparency, accessibility and accountability in respect of the open meeting by the following means:

- a. By making the meeting agenda, as well as the other relevant documents, available on the CRD website, and directing interested persons to the website by means of the notices provided in respect of the meeting,
- b. By making the minutes of the meeting available on the CRD website following the meeting.

Zoom Link: <https://us06web.zoom.us/j/85488011499>

3. Approval of Agenda

1

4. Adoption of Minutes - None

5. New Business

5.1 Fulford Asset Management Plans

2-74

That the Fulford Water Service Commission receive this report for information.

To ensure quorum, advise Shayla Burnham 250 537 4448 if you cannot attend.

EXEC-1295039085-2414

- 6. Next Meeting - TBD**
- 7. Adjournment**

TO: Fulford Water Local Area Service

FROM: Karla Campbell, Senior Manager, Salt Spring Island Electoral Area

DATE: November 3, 2020

SUBJECT: Fulford Asset Management Plans

BACKGROUND:

In 2019 the CRD engaged McElhanney Consulting Services to develop an Asset Management Plan (AMP) for each of the CRD water services on Salt Spring Island. The purpose of the AMP is to ensure that we are being sustainable in our delivery of our service and with that, the CRD has changed the name of the plan to Sustainable Service Delivery Plan (SSDP). An SSDP is essentially a plan to understand the demands of our community, the level of service that is being provided to serve that demand, risk, workforce and management of the asset's current and future lifecycle needs. It guides prioritization of future capital improvements and/or replacement through informed decision making and provides the basis to create a financial strategy for maintaining required and desired level of services. An SSDP ensures that sufficient resources are in place when needed to address the full lifecycle costs of owning tangible capital assets (assets) that are needed for delivering services. An asset is a physical component that has value, enables services to be provided, and has an economic life greater than 12 months.

The SSDP helps put some rigour and structure around the information used to make strategic decisions; and to ensure that the level of service being provided is sustainable and the assets will continue to work well, with no surprises, and provide our citizens with services by providing the following information:

- What are the demands and what is the level of service (current and desired) that is being provided?
- What performance level that each asset need to provide to provide the agreed upon level of service to the community?
- What we own, where it is, and what condition is it in?
- What is the asset's remaining useful life or service life?
- Which assets are the most critical, and what is the level of risk to their function and sustainability?
- What do we need to do to sustain the services provided by each asset? When do we need to do it by? What will it cost?

SSDP is a process used in decision making. It helps the CRD sustain the services that is delivered to the community and essential care for the infrastructure in way that considers service needs of the community; manages risks and opportunities; and uses resources wisely. In effect it is way to ensure safe and sustainable services delivered in a predictable, and cost-effective manner.

KEY FINDINGS:

- Total estimated capital infrastructure replacement is \$705,400
- Roughly 91% (\$2,999,650) of the Fulford assets¹ are overdue for renewal; a further 6% (\$208,300) in 1 – 5 years; and 2% (\$71,500) in 6 plus years.
- Financial planning work is required to address the asset investment while still maintaining sustainable services.
- Recommend resources be attached to improved data and records management to ensure accuracy, and create adequate system maps, working drawings, and system documentation.

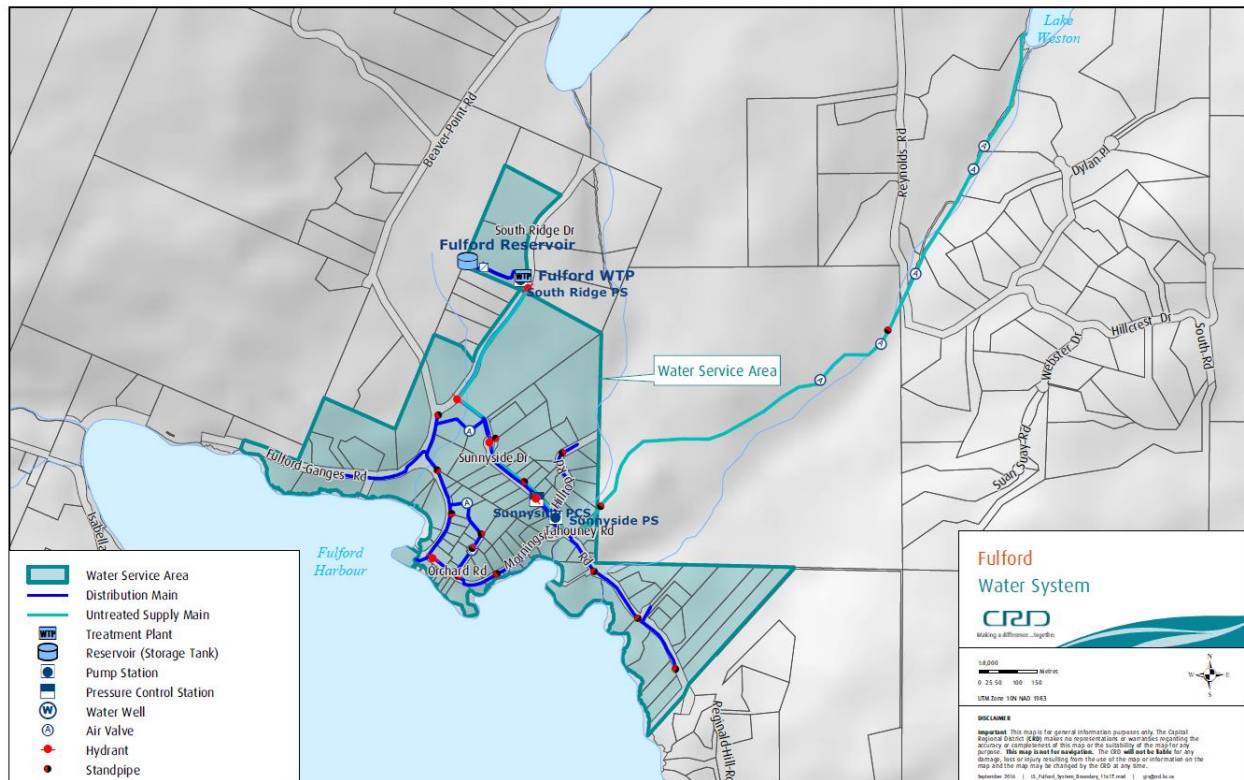
Attachment(s): Fulford Water System Asset Management Plan

KC/AX:kc

¹ Not incl. Reynolds Road building - decommissioned and hatch installation completed in 2020

CRD Salt Spring Island Electoral Area

Fulford Water System Asset Management Plan



Prepared By:

McElhanney Consulting Services Ltd.

www.mcelhanney.com

Date:

May 2020

REVISION No.	REVISION DESCRIPTION	DATE

ACKNOWLEDGEMENT

McElhanney would like to acknowledge and express their appreciation to the CRD and North Salt Spring Waterworks District (NSSWD) staff during this assignment. A team effort was required to develop this Asset Management Plan; and it could not have been completed without the invaluable assistance provided by the following key individuals.

- Luke Sturdy, CRD Operations and Maintenance Operator
- Grant Tamboline, Waterworks Supervisor, North Salt Spring Waterworks District

EXECUTIVE SUMMARY

McElhanney Consulting Services Ltd. (McElhanney) has been retained by the Capital Regional District (CRD) – *Salt Spring Island Electoral Area* to provide an updated asset management plan for the Fulford Water System. The asset management plan is intended to help the CRD optimize allocation of resources, support long term financial plans to fund infrastructure renewal / replacement as required, and further understand associated risks to help ensure that the Fulford Water System meets acceptable levels of service and regulatory requirements.

The asset management plan was developed through review of available system background information, site inspection of each asset, a system capacity assessment for current and future demands; and incorporation of CRD staff comments and concerns.

Based on the data gathered assembling the asset management plan, prioritized capital project recommendations to benefit the Fulford water system have been provided along with recommended time lines for implementation and cost estimates for planning purposes.

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Appendix A – Fulford Water System Boundary Map

Appendix B – Fulford Water System Background Information List

Appendix C – Fulford Asset Condition Assessment Table

Appendix D – Fulford Asset Photo Observation Sheets

Appendix E – Fulford Water System Recommended Capital Projects Table

1. BACKGROUND

1.1. INTRODUCTION

McElhanney Consulting Services Ltd. (McElhanney) has been retained by the Capital Regional District (CRD) – *Salt Spring Island Electoral Area* to provide an updated Asset Management Plan (AMP) for the Fulford Water System. The goals of the Fulford Water System AMP are to help the CRD optimize allocation of resources, support the CRD's long term financial plan to fund infrastructure renewal / replacement as required, and further understand associated risks to help ensure that the Fulford Water System meets acceptable levels of service and regulatory requirements.

McElhanney developed the AMP by reviewing available background information, conducting a site inspection of each asset generating a condition assessment; assessed system capacity for current and anticipated future population; and established prioritized recommendations with related cost estimates based on the study findings.

1.2. SYSTEM SUMMARY

The Fulford Water System is located in a semi-rural residential community with an elementary school and commercial component. The water system is situated on the north side of Fulford Harbour on Salt Spring Island. Lake Weston supplies raw water to the Fulford Water System and is at an elevation of approximately 60 m above sea level with the topography of the water service area ranging between sea level and 60 m.

The area is comprised of 102 parcels of land of which 91 parcels are presently connected to the system. See the *Fulford Water System Boundary System Map* in **Appendix A**.

The Fulford Water System is primarily comprised of the following assets:

FULFORD WATER TREATMENT PLANT, RESERVOIR & PUMP STATION

The water treatment plant draws water from Lake Weston with a treatment process consisting of a rapid mix system, flocculation, dissolved air floatation (DAF), rapid filtration, ultraviolet (UV) disinfection, and chlorination. The water is then pumped to the reservoir. The Fulford reservoir has a capacity of 360 m³ (80,000 IG) and is located south west of Fulford Community Elementary School.

FULFORD DISTRIBUTION SYSTEM

Approximately 4.5 km of water distribution pipe consists of 50 mm to 100 mm asbestos cement pipe installed in 1970 and approximately 2.2 km of 50 mm to 150 mm PVC watermain installed in the late 2000s. The distribution system also includes fire hydrants, standpipes, gate valves; and water service connections complete with water meters.

SUNNYSIDE DRIVE PRESSURE REDUCING STATION

There is one (1) pressure reducing valve station, PRS Sunnyside, in front of 122 Sunnyside Drive.

SUNNYSIDE DRIVE PUMP STATION

The Sunnyside Drive pump station is located across from the Hilltop Road and Sunnyside Drive intersection, specifically at 105 Hilltop Place. The pump station boosts the water supply from Lake Weston to the water treatment plant at a simultaneous pumping rate of 2.3 L/s (30 gpm) from 2 pumps.

1.3. LEVEL OF SERVICE

The level-of-service that a water system should provide can be broken down into a few key areas as follows:

- Regulatory Compliance;
- Capacity of the System (existing and future); and,
- Customer Expectations / Risk tolerance.

The regulatory compliance level-of-service is mandatory and must be achieved to meet minimum public health and safety standards for safe drinking water and safe operation of the system. Regulatory compliance regulations, guidelines and standards for the Fulford Water System are listed in **Section 1.5** for reference.

The capacity of the system relates to the supply, production and delivery of the drinking water to the service area. There are a number of factors that can influence the level-of-service including, how much water people consume, age of the system (reduced efficiency), growth of the service area, climate change, etc. Capacity for the Fulford Water System is discussed in **Section 2.2**.

Customer expectation and risk tolerance is related to how well customers expect the system to perform over the long-term. This can include improved water quality requirements, water storage volumes (for domestic use and fire protection), system conveyance and pressures, system reliability and fire protection (flow, capacity, hydrants, etc.). Risk tolerance also relates to how much preventative maintenance should be performed on the system, when assets should be upgraded or replaced, system redundancy, and seismic resiliency.

The CRD has defined customer expectation and risk tolerance for the Fulford Water System as follows:

- Water quality meets regulatory compliance and safe water drinking guidelines;
- Fire flows/capacities are not supported; however, some hydrants are present;
- Storage capacity is adequate for existing usage, however, does not meet requirements for peak demand, or fire flows;
- Flushing of watermain occurs once per year for maintenance of the system, including exercising valves and hydrants;
- Pipe sizing is adequate for existing usage, but does not meet minimum requires as per Fire Underwriters Society;
- There is no system wide leak detection program;
- There is no back up power at critical infrastructure;
- There is no minimum requirement for pressure or flow for individual services; and,
- Maintenance program is a combination of preventative and reactive (discussed in more detail below), with the goal leaning more towards cost savings, rather than system resiliency.

1.4. 2011 FULFORD WATER SYSTEM ASSET MANAGEMENT PLAN

The Fulford Water System was first developed in 1968 under the name 'Fulford Water Improvement District'. The CRD undertook a feasibility study in 2000 towards ownership of the system and then established the 'CRD Fulford Water Service' in 2004. In 2011, the CRD developed a Fulford Water System AMP to re-evaluate the system and recommend improvements. The following table summarizes the 2011 Fulford Water System AMP recommendations, confirms if the recommendations are currently still valid and if they have been addressed.

TABLE 1 – 2011 FULFORD WATER SYSTEM AMP EVALUATION AND IMPROVEMENTS SUMMARY

Item #	Category	Asset Name	2011 AMP Evaluation / Recommendation	Still Valid ?	Addressed as of 2018 ?
1	Water Source	WTP FULFORD	"The quality of the raw water provided by Weston Lake represents the most significant issue related to the water source. Weston Lake is considered a eutrophic lake (high in nutrients and low in oxygen). Consideration should be given to the potential needs and implementations of control programs for algae, aquatic weeds or other undesirable aquatic organisms."	YES	NO
2	General	WTP FULFORD	"The existing system is over 40 years old, with much of the infrastructure showing its age. The 2010 Annual Water Quality Report for the Fulford water system indicated that the system continues to produce safe drinking."	YES	NO
3	Disinfection and Treatment	WTP FULFORD	"The Fulford water system currently has a DAF, rapid sand filtration WTP along with UV and chlorine disinfection. The WTP has ultimately a treatment capacity of 392 m ³ /day. This equipment is all less than two years old."	NO	YES
4	Storage	WTP FULFORD (RES FULFORD)	"The Fulford water system existing storage capacity for treated water is considered to be adequately sized to provide emergency and equalization storage."	NO	YES

Item #	Category	Asset Name	2011 AMP Evaluation / Recommendation	Still Valid ?	Addressed as of 2018 ?
6	Distribution System	DISTRIBUTION FULFORD	"The existing distribution system currently meets the domestic needs of the community but the non-revenue water production of 40% is considered significant. The water distribution system is not designed to provide fire protection. The mains are two-thirds asbestos cement (4,500 m) and reported to have been constructed in the late 1980s, making them almost 30 years old. The other third of the mains is PVC (2,200 m) and the majority of this pipe is less than 10 years old."	YES	NO Distribution flow is considered to be adequate, provided fire flows are not required
7	Distribution System	DISTRIBUTION FULFORD	"A program to replace the asbestos cement distribution mains should be initiated to reduce the water loss in the system. It would be desirable to replace the AC mains within the next five to ten years."	YES	NO See recommendations
9	Distribution System	DISTRIBUTION FULFORD	"The system contains a number of dead-end mains that cannot be interconnected as they service narrow areas that are at the extremities of the system or difficult terrain makes them difficult to loop. Flushing these mains during the summer months will be required to ensure chlorine residual and to maintain water quality."	YES	NO See recommendations
10	Distribution System	DISTRIBUTION FULFORD	"Distribution components associated with the asbestos cement watermain will be replaced as part of any watermain replacement program. Many of these components are as old as the mains. The valves need to be located and those that operate should be exercised regularly. The valves that do not operate should be identified and only replaced if they are critical to the operation of the distribution system."	YES	NO See recommendations
11	Distribution System	DISTRIBUTION FULFORD	"The watermain would need to be upgraded to a minimum 150 mm in order to provide fire protection."	YES	NO See comments on watermain pipe sizing in the Capacity Analysis

Further discussion on the "Still Valid" 2011 AMP system evaluation and recommendations that have not been addressed as of 2018 are covered in **Section 3**.

1.5. REGULATORY COMPLIANCE

The operation and maintenance of a water utility should be compliant with Provincial and Federal legislation, regulations, guidelines and standards as listed below, but not limited to:

- Guidelines for Canadian Drinking Water Quality, Health Canada
- Drinking Water Protection Act and Regulations, British Columbia
- Dam Safety Regulations – Water Act, British Columbia – Water Licenses
- British Columbia Water Sustainability Act and Groundwater Protection Regulation
- Island Health Authority
- Worksafe BC

1.6. MAINTENANCE PROGRAM

The Fulford Water System currently relies on a combination of preventative maintenance for larger serviceable items and reactive maintenance for smaller non-serviceable items, but not limited to:

- Currently using Preventative Maintenance Practices, with maintenance activities (PM's) scheduled in the Strategic Asset Plan (SAP);
- Smaller replaceable assets rely on reactive maintenance (fix it when it breaks), which is common industry practice;
- A shift to more predictive maintenance practices for critical assets may provide a more reliable system; however, this practice would increase costs, and may not be deemed necessary for a system of this size;
- Currently, some spare parts are not stored on Salt Spring Island and are kept in a pool of spare parts to be shared with other services within the CRD in an effort to reduce costs. Maintaining an inventory of critical spare parts on-hand may provide a more reliable system; however, maintaining such inventory would increase costs; and,
- The lifecycle plan for major assets (i.e. water treatment plant, reservoir, pump stations, etc.) will be to maintain and operate until it becomes cost-prohibited to do so. This lifecycle point will be anticipated through maintenance reviews and updated AMPs, at which time options for replacement/upgrade will be evaluated.

2. SYSTEM FINDINGS

2.1. ASSET ASSESSMENTS

McElhanney undertook an investigation which included review of available CRD system information and conducted site condition assessments for each asset with CRD staff.

2.1.1. SYSTEM BACKGROUND INFORMATION REVIEW

McElhanney reviewed Fulford Water System information made available by the CRD which primarily consisted of the documents listed in **Appendix B**. Relevant information was used to further understand the system and confirm asset components.

2.1.2. CONDITION ASSESSMENTS

Site assessments were completed to determine asset physical condition, establish criticality, and estimated remaining service life. The four (4) system assets have been defined as follows:

- **FULFORD WTP** – The water treatment plant and pump station are located on South Ridge Drive, adjacent to the Fulford Elementary School. A 360 m³ (80,000 IG) capacity bolted-steel water tank is located northwest of the water treatment plant.
- **FULFORD DISTRIBUTION** - Approximately 4.5 km of asbestos cement and 2.2 km of PVC water distribution pipe and appurtenances located throughout the system area.
- **PRS SUNNYSIDE** – Pressure reducing valve station located on Sunnyside Drive near Hilltop Road.
- **PST SUNNYSIDE** - Pump station located next to Sunnyside Drive and Hilltop Road intersection.

The site assessments occurred over a two-day period on September 13th & 14th 2018. CRD staff attended the reviews to provide site access and offer relevant background information. CRD Operations staff input on the assessments is covered in **Section 2.1.7**.

Assets were assessed primarily focusing on mechanical, civil, health & safety, electrical, and structural aspects. Assessments were based on the criteria described in the following sections.

2.1.3. ASSET PHYSICAL CONDITION GRADING SYSTEM

Asset physical conditions were graded based on the level of maintenance now required and on expected renewal / rehabilitation requirements:

1. **Very Good** – Asset is physically sound, performing its function as originally intended. Generally new or recently rehabilitated. Only planned maintenance required.
2. **Good** – Asset is physically sound, performing its function as originally intended. Required maintenance costs as within acceptable standards but increasing. Asset has been used for some time but is within mid stage of expected life.
3. **Fair** – Asset is showing signs of deterioration, performing at a lower level than originally intended. Some components are becoming physically deficient. Required maintenance costs exceed acceptable standards and increasing. Asset within the later stages of expected life.
4. **Poor** – Asset is showing significant signs of deterioration, performance is much lower than originally intended. Majority of asset is physically deficient. Required maintenance costs significantly exceed acceptable standards. Asset is approaching end of expected life.

5. **Very Poor** – Asset is physically unsound and/or not performing as originally intended. Asset has higher probability of failure or failure is imminent. Maintenance costs are unacceptable. Replacement / major refurbishment required.

2.1.4. ASSET CRITICALITY GRADING SYSTEM

Asset criticality grades were established focusing on system interruption risk and health and safety issues. The grades are based on the following criteria:

1. **Non-Critical Asset** – Failure would not result in an immediate problem.
2. **Asset Standby Equipment Available** – Asset failure would result in replacement/repairs which could be completed relatively quickly.
3. **No Asset Equipment Redundancy** – Asset failure could result in moderately prolonged service interruption. Asset standby equipment not readily available.
4. **No Equipment Redundancy & Failure of equipment not monitored by alarm** - Asset failure could cause prolonged system interruption. Significant time and cost to get system back online.
5. **No Equipment Redundancy & Failure of equipment not monitored by alarm and/or immediate Health & Safety Concerns** - Asset Failure could cause prolonged system interruption. Significant time and cost to get system back online. Asset essential to health and safety requirements.

2.1.5. ASSET DATA CONFIDENCE GRADING SYSTEM

Assets were graded based on available data and records including but not limited to; documented procedures, investigations, analyses, reports, and drawings. Data confidence grades are based on the following criteria:

- A. **Highly Reliable** - Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete. Accuracy estimated +/- 2%.
- B. **Reliable** - Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, i.e. some data is old, missing, and / or extrapolated. Dataset is complete. Accuracy estimated +/- 10%.
- C. **Uncertain** - Data is based on sound records, procedures, investigations and analysis which is incomplete, unsupported, and/or extrapolated. Dataset is substantially complete but up to 50% is extrapolated. Accuracy estimated +/- 25%.
- D. **Very Uncertain** - Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most of the data is estimated or extrapolated. Accuracy estimated +/- 40%.
- E. **Unknown** - Very little or no data available.

2.1.6. ASSET SYSTEM CAPACITY GRADING SYSTEM

A capacity analysis was conducted for existing and future system requirements based on anticipated growth projections. The asset capacity analysis findings are discussed further in **Section 2.2**. Assets were graded based on capacity to meet current and long-term demands. Capacity Grades are based on the following criteria:

- A. **Excellent** - The asset has the capacity to meet long-term demand up to 10 years.
- B. **Good** - The asset has the capacity to meet medium-term demand up to 5 years.
- C. **Moderate** - The asset has the capacity to meet short-term growth demands.
- D. **Borderline** - The asset has the capacity to meet short-term growth demands but experiences some shortfalls.
- F. **Fail** - The asset capacity is not meeting its current demand and experiencing frequent shortfalls.

2.1.7. ASSET SERVICE LIFE

Estimated remaining service life of each asset and/or essential components were taken into consideration for the condition assessment with known installation dates.

Asset assessment data have been compiled into the *Asset Condition Assessment Table* found in **Appendix C**. The tables summarize the assessment findings and are grouped into mechanical, civil, health and safety, electrical, and structural components. The table provides additional information such as asset equipment description, general comments, location, gradings, service life, recommendations related to asset capital projects for improvements / upgrades, along with estimated costs. Capital project recommendations and cost estimates are discussed further in **Section 3**. *Photo Observation Sheets* found in **Appendix D** provide additional photographic details of select assets.

2.1.8. CRD AND NSSWD INPUT

CRD and NSSWD operator comments and concerns were collected and incorporated into the AMP recommendations. Comments and concerns received for the Fernwood Water System are listed below:

- “The Reynolds Road meter building with strainer should be decommissioned and a vault be installed.”
- “The Sunnyside air valve should be replaced.”
- “The Sunnyside (PST Sunnyside) booster pump impellers were “shaved down” and need to be replaced with correct impellers. The impellers will allow the plant to be able to run at maximum design flow of 4 L/s instead of the current operating flow of 2.2 L/s.”
- “The 50 mm galvanize piping in the Sunnyside pressure reducing valve station is rusted, corroded, and starting to leak.”
- “The air valves on the raw water line through Frasers’ Easement, from Reynolds Road to Tahouney Road, should be upgrade/replaced.”
- “The reservoir should be clean and inspect, as this has never been done since installation of the reservoir.”
- “The water service at 341 Reynolds Road has a direct water connection to the raw water line. Has requirements been addressed?”
- “The raw water intake pipe has never been inspected. Divers have not been there ever.”
- “The weir site has not been inspected.”
- “There is a beaver dam. Who is responsible for maintenance of the beaver dam?”
- “A security fence is needed at the treatment plant facility.”

2.2. SYSTEM CAPACITY ANALYSIS

Existing and Future Demand

The Fulford water service area is comprised of 102 properties of which 91 are connected to the system. Within those 91 parcels, there are 95 single family equivalents (SFE) as the use on some parcels represent more than one dwelling.

Between 2014 and 2017, total water produced has varied between 27,805 m³/year and 29,506 m³/year. The Fulford Water System does not have residential water meters; therefore, water consumption was not tracked and a single-family equivalent (SFE) water consumption was calculated. As per the 2017 annual report, the SFE water demand has increased from 234 m³/year in 2016 to 238 m³/year in 2017. Water consumption by users have been fluctuating by 5.8% over the past four years. This fluctuation may be typical throughout the CRD in areas with limited population growth as demand per capita has been decreasing.

Demand in the system varies significantly over the year, with the peak occurring in July or August. The measured Maximum Day Demand (MDD) in 2011 was 191 m³/day or 1,900 L/day per service connection. This is significantly lower than the CRD design criteria for MDD of 2,680 L/day per service connection.

While population on Salt Spring is anticipated to grow by approximately 2.5% per year, it is also predicted that water consumption per person will continue to decrease. Currently 89% of the properties in the water district are serviced. Unless the boundaries of the water service area are expanded, or significant subdivision occurs within the water service boundaries, it is anticipated that future demand will remain at current levels or perhaps decrease slightly.

Water Supply

The CRD holds two water licenses for Lake Weston to divert a total of up to 106,400 m³ per year (292 m³/day) and store up to 49,300 m³. Lake Weston is estimated to have a total volume of 1,090,000 m³. Lake Weston is subject to seasonal water quality changes and is affected by algae blooms. We are not aware of any recent hydrological studies to determine the capacity of the lake. The peak volume of water withdrawn from the lake between 2014 and 2017 was 29,506 m³/year. This peak volume is approximately 28% of the allowable capacity under the water licenses.

Lake Intake

The existing lake intake was constructed in conjunction with the current water treatment plant. The capacity of the intake meets the capacity of the treatment plant. There were no issues observed or identified with respect to the condition or operation of the existing lake intake.

Water Treatment Plant & Pump Station

The rated design flow for the water treatment plant is 4.5 L/s or 390 m³/day. This is approximately 2 times the MDD recorded in 2011. The treatment plant appears to have adequate capacity for the demand; however, further investigation should be conducted to assess plant efficiencies at lower demands. This recommendation has been captured in **Section 3**.

Water Storage

There is one water storage reservoir in the system with a capacity of 360 m³ (80,000 IG). The reservoir operates a single pressure system and is at an elevation of approximately 90 m above sea level.

Water reservoir capacity is comprised of three components: balancing storage, fire storage and emergency storage. Balancing storage should be a minimum of 25% of maximum day demand. Fire storage is dependent on the properties being protected, but for rural residential should be a minimum of 60 L/s for 1.5 hours or a total of 324 m³. Emergency storage is 25% of the balancing + fire storage.

The Fulford reservoir has a storage volume of 360 m³. It supplies water to approximately 91 properties (95 SFE). The Fulford Reservoir is fed from the South Ridge pump station. Balancing storage requirements are 47.7 m³. Fire storage is 324 m³ and emergency storage is 93 m³. The total storage for requirement for Fulford is 464.7 m³. This reservoir has adequate storage for domestic flows but lacks capacity for full fire protection.

Water Distribution

The water distribution system consists of 6.7 km of distribution main, in which there are 4.5 km of asbestos cement and 2.2 km of PVC piping. The system contains approximately half a dozen “dead end” mains. Most of these “dead ends” mains cannot be looped because they are located at the end of narrow service areas. There is an elevation drop from the Lake Weston to the properties closer to the ocean, which requires a pressure reducing stations along the route.

The 100 mm mains do not meet design guidelines and are under sized for fire flow as the friction head loss at fire flow would be excessive. At domestic flow rates, the friction head loss is lower, and the existing mains seem to provide adequate flow and pressure. The minimum size for watermains is 150 mm.

Summary

As it is anticipated that future demand will remain at current levels or perhaps decrease slightly, future system capacity analyses were not evaluated. The following table provides a brief summary of the system capacity findings based on fire flow requirements not being required.

TABLE 2 FULFORD WATER SYSTEM CAPACITY ANALYSIS SUMMARY TABLE

Asset Name	System Components	System Capacity	System Capacity Grades (Defined in Section 2.1.6)
WTP FULFORD	Water Supply (From Weston Lake)	106,507 m ³ /year (water license limit)	A
WTP FULFORD	Lake Intake	292 m ³ /day	A
WTP FULFORD	Water Treatment Plant and Pump Station	292 m ³ /day	A
RES FULFORD	Water Storage	360 m ³ (80,000 IG)	A
DISTRIBUTION FULFORD	Water Distribution	Measured MDD in 2011 was 190 m ³ /day or 1,900 L/day per service	D

Evaluation Design Criteria

The system capacity analysis referenced the following list of design criteria and guidelines:

- Design Guidelines for Rural Residential Community Water System, BC
- CRD Juan de Fuca Water Distribution Engineering Specifications
- Master Municipal Construction Document Design (MMCD) Guidelines
- Fire Underwriters Survey (FUS) – Water Supply for Public Fire Protection
- American Water Works Association (AWWA) Standards
- Recommended Standards for Water Works, Health Research Inc.

3. RECOMMENDATIONS

Prioritized capital project recommendations with recommended timelines and estimated costs have been developed for the Fulford Water System to support the CRD's asset management goals. The recommendations along with supporting data have been detailed in the *Fulford Water System Recommended Capital Projects Table* in **Appendix E**. Itemized recommendations are referenced to the *Condition Assessment Table* in **Appendix C** for further information and have been sorted by timeline prioritization. Prioritization, cost estimates, and evaluation source are further described below.

3.1. GOVERNING PRINCIPLES

The capital project recommendations are prioritized based on the Fulford Water System AMP governing principles which have been developed to align with the CRD's water system level of service and asset management strategic goals. The governing principles, along with recommended timeline for project completion have been defined as follows:

- 1. Mandated Projects (IMMEDIATE: to be completed immediately to within one (1) year)**
These are projects that are mandated by senior level of government. Projects required to adhere to regulatory compliance is an example of this.
- 2. Health and Safety Issues (IMMEDIATE: to be completed immediately to within one (1) year)**
These are projects, that if not completed, could impact health, safety and property.
- 3. Community Priority (SHORT TERM: to be completed within one to five years)**
These are projects that have been identified as a higher priority to benefit the community.
- 4. Operating Efficiencies / Costs (SHORT TERM: to be completed within one to five years)**
These are projects that are intended to help reduce higher than usual operations and maintenance costs, and / or improve system functionality
- 5. Economic Support (LONG TERM: to be completed after six (6) plus years)**
These are projects that are not immediately necessary but may be provided through community funding and grants.
- 6. Sustainability (LONG TERM: to be completed after six (6) plus years)**
These are projects related to asset life cycle planning. All systems deteriorate over time; as such they will require maintenance and replacement.

3.2. COST ESTIMATES

Estimated costs have been provided as an order of magnitude approximation for planning purposes. There are several limitations with preliminary budgetary estimates due to many variables and unknowns for work without detailed cost estimations, and assembling quotes, especially where the work may take place many years from now. CRD costs such as procurement, staff time, contingencies and additional operations and maintenance should be considered along with a detailed evaluation of any design, permitting, and construction costs. Timing and extent of asset upgrades and/or replacements is highly dependent on how well existing equipment is maintained in the interim and the owner following regularly scheduled AMP reassessments which are recommended to be completed every 5 years. For the Purposes of this exercise, cost estimates are generally intended to only include, engineering / design / planning, equipment procurement, and construction with a relatively small contingency (approx. 10%).

3.3. EVALUATION SOURCE

The evaluation source for each asset capital project recommendation are listed in the *Fulford Water System Recommended Capital Projects Table*. Each of the evaluation sources listed below have been detailed throughout this report:

- Asset condition assessment;
- Review of current and future asset capacity requirements;
- Review of previous system AMP recommendations and current status; and,
- Incorporation of system comments and concerns from CRD staff.

4. FINANCIAL PLANNING

It was identified at the outset of this AMP that there were insufficient funds available to complete Financial Planning for implementation of the AMP recommendations. As such, Financial Planning will be completed by the Manager of Engineering, Salt Spring Island Electoral Area, in cooperation with CRD's Operations and Financial departments.

5. IMPROVEMENT PLAN

To help ensure future asset management plans and re-assessments on the CRD Salt Spring Island Electoral Area's water systems are executed effectively and efficiently, the following suggestions are provided for consideration:

- Provide additional details in future asset management plan request-for-proposals on service delivery expectations, report formatting, additional system background information, and avoid setting limitations on man-hours;
- Provide CRD staff NAMS training if the CRD wish to utilize this asset management system moving forward;
- Provide more time and opportunity for Operations staff to communicate issues, concerns, histories, and system details during asset management plan updates;
- Allocate additional time and resources to CRD staff to assemble, update, and keep track of all documentation relating the water system which could assist in future asset management planning exercises;
- Provide resources for more detailed Condition Assessments of critical equipment including, but not limited to, take-down, asset inspections, and non-destructive testing;
- Provide resources to provide more thorough review maintenance records;
- Provide resources to complete financial planning for recommended works; and,
- Provide resources to update / create adequate system maps, working drawings, and record documentation.

6. CLOSURE

We thank you for the opportunity to work on advancing the CRD Salt Spring Island Electoral Area's asset management planning and strategy for the Fulford Water System and sincerely look forward to working with you in the near future

This report has been prepared by **McELHANNEY CONSULTING SERVICES LTD.**

Prepared by:

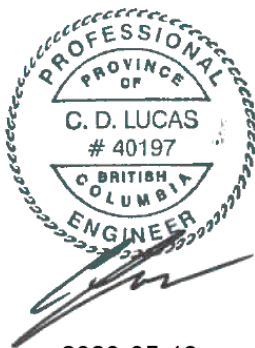


Chris Lucas, P.Eng.
Senior Project Manager

Reviewed by:



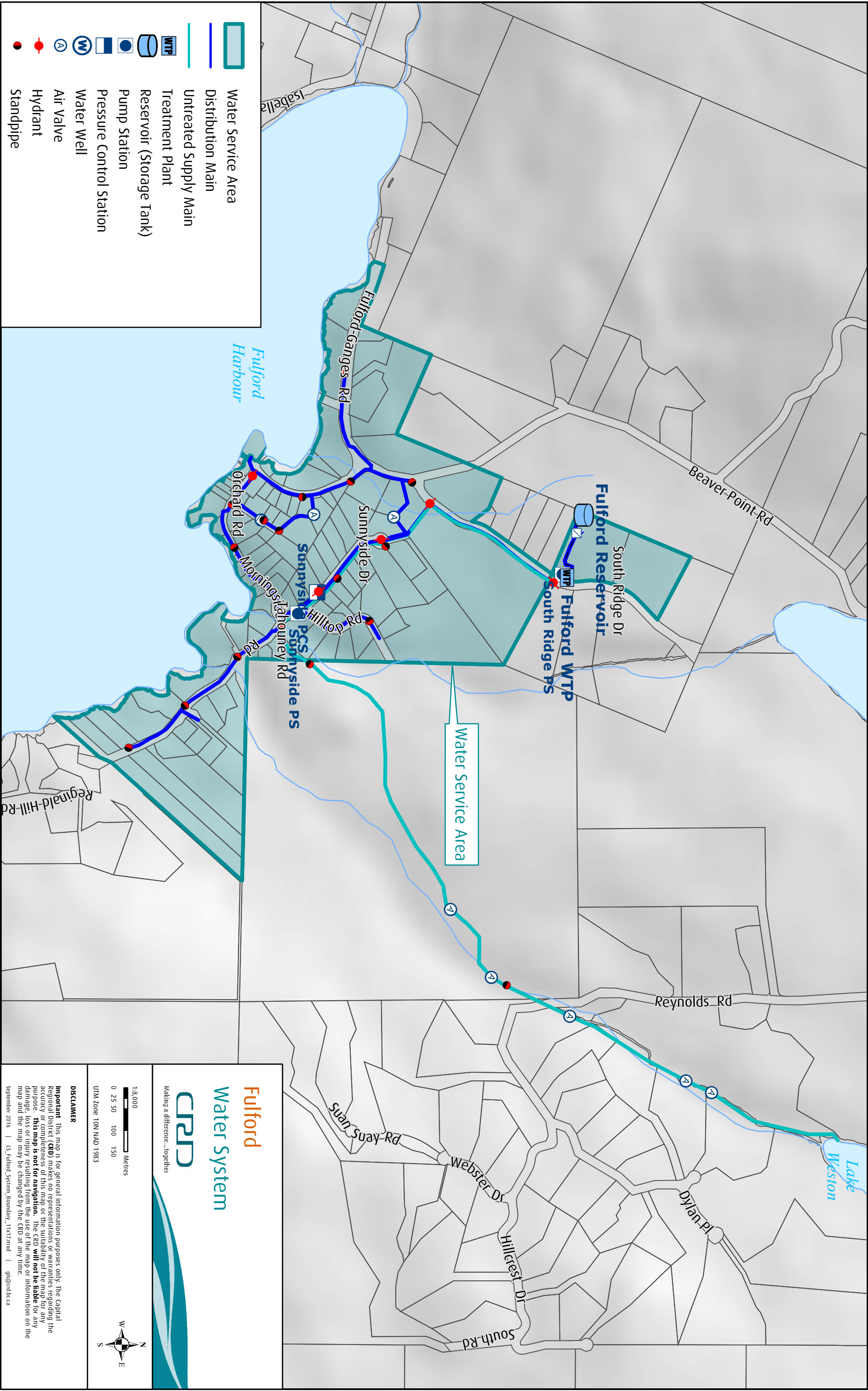
Ian Whitehead, P.Eng.
Vice President



2020-05-19

APPENDIX A

FULFORD WATER SYSTEM BOUNDARY MAP



APPENDIX B

FULFORD WATER SYSTEM BACKGROUND INFORMATION LIST

FULFORD WATER SYSTEM DOCUMENTS

- 1** FULFORD WATER SYSTEM BOUNDARY AND LAYOUT
- 2** SAMP - UPDATED FEB 2012 (DRAFT)
- 3** FULFORD WATER SERVICE - 2017 ANNUAL REPORT - JUNE 4, 2018
- 4** WATER SYSTEM (EXISTING AND PROPOSED)
- 5** BYLAW MAPPING
- 6** FULFORD RESERVOIR AND TREATMENT PLANT
- 7** SUNYSIDE RESERVOIR, DISSOLVED AIR FILTRATION, AND TREATMENT PLANT

APPENDIX C

FULFORD WATER SYSTEM ASSET CONDITION ASSESSMENT TABLE

Item No.	Water System	Asset Name	Component	Object Types	Equipment Identifier			Equipment Location			Asset Ratings					Asset Service Life			Capital Project Recommendations and Cost Estimate	
					Equipment Description	Quantity	Comments	Location	System Description	Physical Condition	Criticality	Data Confidence	Capacity Adaptation	Date Installed	Service Life	Anticipated Replacement / Rehabilitation Date	Recommended Upgrade / Replacement / Investigation Capital Projects	Estimated cost (in 2019 dollars)		
27	Fulford	WTP FULFORD	Electrical	FLT	FLT, Process Instruments, Level Transducer	3	Backwash, Cleanwell and Rise Tanks, all float and level transducer wiring susceptible to damage and vandalism.	Backwash, Cleanwell and Rise Tanks	Tank level sensing	2	5	A	A	A	2010	15	2025	Provide a secure vault for float and level transducer wiring	\$6,000	
28	Fulford	WTP FULFORD	Electrical	HVAC	HVAC, Electric Forced Air Unit Heater 3kW	1		Pump Station	Electric Heat	2	1	A	A	A	2010	15	2025			
29	Fulford	WTP FULFORD	Electrical	LIT	LIT, Light, Bagfill Fluorescent 2 lamp T8 Vapour Proof	3	T8 lamps considered outdated, LED replacement should be considered	Pump Station	Lighting	2	1	A	N/A	N/A	2010	10	2020	Replace T8 lamps with LED lighting	\$1,000	
30	Fulford	WTP FULFORD	Electrical	LIT	LIT, Light, Emergency Lighting Ready-Lite	1		Pump Station	Emergency Backup Lighting for building egress	2	2	A	N/A	N/A	2010	10	2020			
31	Fulford	WTP FULFORD	Electrical	REC	REC, Receptacles	2		Pump Station	Receptacles	2	1	A	A	A	2010	10	2020			
32	Fulford	WTP FULFORD	Electrical	FLT	FLT, Process Instruments, Float Switch	2		Reservoir	Tank level sensing	2	5	A	A	A	2010	15	2025			
33	Fulford	WTP FULFORD	Electrical	FLT	FLT, Process Instruments, Level Transducer	1		Reservoir	Tank level sensing	2	5	A	A	A	2010	15	2025			
34	Fulford	WTP FULFORD	Structural	SIT	SIT, Overall Site	1	Ongoing maintenance is being performed by CRD personnel. Ground cover is maintained on a regular basis.	Treatment Plant	Site is sloping with a stacked rock retaining wall to provide a flat area for the chlorine treatment building.	1	1	A	N/A	N/A	2011	50	2061			
35	Fulford	WTP FULFORD	Structural	DWY	DWY, Driveway, Gravel	1	Gravel driveway is well maintained and accessible.	Pump Station	Gravel driveway is shared with the DAF treatment building. Driveway is sloped down to South Ridge Drive.	1	1	A	N/A	N/A	2011	50	2061			
36	Fulford	WTP FULFORD	Structural	PKG	PKG, Parking Lot	1	Gravel driveway is well maintained and accessible.	Pump Station	Parking is part of the driveway. Overflow parking on the side of South Ridge Drive.	1	1	A	N/A	N/A	2011	50	2061			
37	Fulford	WTP FULFORD	Structural	SER	SER, Service, Stormwater	1	No service issues were noted.	Pump Station	Stormwater exits the site into a ditch along South Ridge Drive.	1	1	A	A	N/A	2011	50	2061			
38	Fulford	WTP FULFORD	Structural	FEN	FEN, Fence, Perimeter	0	Perimeter fencing is required to secure the water treatment facilities. See Main Building.	Pump Station	There is no perimeter fencing around the site.	5	1	A	A	N/A	2011	25	2036	Install perimeter fencing around WTP	Refer to Item (1)	
39	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Foundation	15.0 m ²	No foundation issues were noted.	Pump Station	Foundation is a reinforced concrete foundation and slab on grade system.	1	1	A	A	A	2011	50	2061			
40	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Wood Frame	15.0 m ²	PST, South Ridge houses pumping and chlorination systems and is located on the same site as WTP Fulford. The building is a single storey wood frame structure on a concrete slab on grade foundation system.	Pump Station	Structure is a wood framed wall and roof system.	1	1	A	A	A	2011	50	2061			
41	Fulford	WTP FULFORD	Structural	STR	STR, Structure Cladding, Cement	15.0 m ²	Exterior walls are covered in horizontal cementitious siding. No cladding issues were noted.	Pump Station	The building is clad in cement based siding with a rainscreen system.	1	1	A	A	A	2011	25	2036			
42	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Openings, Exterior	15.0 m ²	Door mules are required to prevent door to frame contact. Door contactors for alarm system require replacement with roller type devices.	Pump Station	There are no windows in the building. Doors are insulated metal with metal frames and emergency hardware.	2	1	A	A	A	2011	25	2036	Install door mules and replace roller type alarm system.	\$3,000	
43	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Roof	15.0 m ²	The roof system is sloped with asphalt shingle roofing and metal gutters. Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure.	Pump Station	Roof is an asphalt shingle system with metal gutters and downspouts.	2	1	A	A	A	2011	25	2036	Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure.	\$4,000	
44	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Partitions, Interior	15.0 m ²	No issues were noted with interior partitions.	Pump Station	Separation wall between pumps and chlorine room are wood framed.	1	1	A	A	A	2011	25	2036			
45	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Finishes, Interior	15.0 m ²	No issues were noted with interior finishes.	Pump Station	Walls and ceiling are covered in painted plywood sheathing. Floor is an exposed concrete slab.	1	1	A	A	A	2011	15	2026			
46	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Openings, Interior	15.0 m ²	N/A	Pump Station	Structure interior opening	1	1	A	A	A	2011	25	2036			
47	Fulford	WTP FULFORD	Structural	HVAC	HVAC, Exhaust System	1	There is no washroom facility. There is a building exhaust system. There is a requirement for a washroom facility on site (see Main building).	Pump Station	Structure mechanical	1	1	A	A	N/A	2011	25	2036	There is a requirement for a washroom facility on site	\$6,000	
48	Fulford	WTP FULFORD	Structural	ELC	ELC, Heater	1	Heating is provided by an electric unit heater and baseboard heaters. There is no emergency generator to operate emergency systems in case of a power outage.	Pump Station	The building is heated with an electric unit heater and baseboard heater.	1	1	A	N/A	N/A	2011	25	2036			
49	Fulford	WTP FULFORD	Structural	SAF	SHO/EXT, emergency eye wash station, fire extinguisher	1	Emergency wash station and fire extinguisher are serviced on a regular basis. There is a requirement for a hot water tank in the chlorine room to temper the water provided for the eye wash station.	Pump Station	There is an emergency eye wash station. There is a fire extinguisher installed. There is a chlorine condenser system.	3	1	A	A	N/A	2011	25	2036	Install hot water tank to temper water provided for eye wash station.	\$3,000	
50	Fulford	WTP FULFORD	Structural	SIT	SIT, Overall Site	1	Ongoing maintenance is being performed by CRD personnel. Ground cover is maintained on a regular basis.	Reservoir	Site is sloping with a fill area created at the top of the site for the tank and foundation.	1	1	A	A	N/A	2011	50	2061			
51	Fulford	WTP FULFORD	Structural	PTH	PTH, Access Pathway	1	Grass path is maintained on a regular basis.	Reservoir	Access is by way of a grass path from the school below.	1	1	A	A	N/A	2011	50	2061			
52	Fulford	WTP FULFORD	Structural	PKG	PKG, Parking Lot	0	N/A	Reservoir	There is no parking for the site.	1	1	A	A	N/A	2011	50	2061			
53	Fulford	WTP FULFORD	Structural	SER	SER, Service, Water System	1	N/A	Reservoir	All services are related to water system.	1	1	A	A	N/A	2011	50	2061			
54	Fulford	WTP FULFORD	Structural	FEN	FEN, Fence, Perimeter	0	Perimeter fencing is required to secure the water reservoir from vandalism.	Reservoir	There is no perimeter fencing around the site.	1	1	A	A	N/A	2011	25	2036	Install perimeter fencing around water reservoir.	\$15,000	
55	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Foundation, Concrete	1	No foundation issues were noted.	Reservoir	Foundation is a reinforced concrete foundation system.	1	1	A	A	A	2011	50	2061			
56	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Tank, Steel	1	RES Fulford is located above the adjacent school playing field. The reservoir is a packaged metal tank on a concrete foundation system.	Reservoir	Tank is a packaged steel tank.	1	1	A	A	A	2011	50	2061			
57	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Cladding	1	No cladding issues were noted.	Reservoir	Tank is clad in prefinished sheet metal.	1	1	A	A	A	2011	25	2036			
58	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Openings, Exterior	1	No issues noted with exterior openings.	Reservoir	Tank lid is secured from vandalism.	1	1	A	A	A	2011	25	2036			
59	Fulford	WTP FULFORD	Structural	STR	STR, Structure, Roof	1	No issues were noted with the roof of the tank.	Reservoir	Roof is part of the packaged steel tank.	1	1	A	A	A	2011	25	2036			

Item No.	Water System	Asset Name	Component	Object Types	Equipment Description	Equipment Identifier			Equipment Location			Asset Ratings				Asset Service Life			Capital Project Recommendations and Cost Estimate	
						Quantity	Comments	Location	System Description	Physical Condition	Criticality	Data Confidence	Capacity Adaptation	Date Installed	Service Life	Anticipated Replacement / Refurbishment Date	Recommended Upgrade / Replacement / Investigation Capital Projects	Estimated cost (in 2019 dollars)		
60	Fullford	WTP FULLFORD	Structural	LAD	LAD, Ladder, Reservoir Access, Ladder	1	The metal hatch at the bottom of the ladder enclosure requires a new lock.	Reservoir	The exterior metal ladder system is part of the packaged tank.	1	1	A	N/A	2011	25	2036	Install new lock on metal hatch at the bottom of the tank's ladder	\$100		
61	Fullford	WTP FULLFORD	Structural	RAI	RAI, Railing, Exterior	1	There were no issues noted with exterior railings.	Reservoir	The metal ladder enclosure and upper railing are part of the packaged tank.	1	1	A	N/A	2011	25	2036				
62	Fullford	WTP FULLFORD	Structural	SAF	LAD, Ladder, Enclosure	1	No issues were noted with the safety of the tank.	Reservoir	Fall prevention at the ladder enclosure is by way of a metal enclosure around the ladder and upper hatch.	1	1	A	N/A	2011	25	2036				
63	Fullford	WTP FULLFORD	Structural	SIT	SIT, Overall Site	1	Ongoing maintenance is being performed by CRD personnel. Ground cover is maintained on a regular basis. Adjacent trees require trimming to prevent damage to the roof system and adjacent finishes. Invasive blackberry bushes in back of WTP should be removed.	Treatment Plant	Site is sloping with a Loc Block retaining wall to provide a flat area for the DAF Main building.	2	1	A	N/A	2011	50	2061	Tree and bush trimming required around facility to prevent damage to facility roofing and finishing.	\$4,000		
64	Fullford	WTP FULLFORD	Structural	DWY	DWY, Driveway, Gravel	1	Gravel driveway is well maintained and accessible.	Treatment Plant	Gravel driveway is shared with the chlorination building. Driveway is sloped down to South Ridge Drive.	1	1	A	N/A	2011	50	2061				
65	Fullford	WTP FULLFORD	Structural	PKG	PKG, Parking Lot, Gravel	1	Gravel driveway is well maintained and accessible.	Treatment Plant	Parking is part of the driveway. Overflow parking on the side of South Ridge Drive.	1	1	A	N/A	2011	50	2061				
66	Fullford	WTP FULLFORD	Structural	SER	SER, Service, Stormwater	1	Positive drainage is required at the rear of the pipe entry shed. Consider tying rainwater downspout to the existing perimeter drainage for the main part of the building.	Treatment Plant	Stormwater exits the site into a ditch along South Ridge Drive.	2	1	A	N/A	2011	50	2061	Positive drainage is required at the rear of the pipe entry shed. Consider tying rainwater downspout to the existing perimeter drainage for the main part of the building.	\$5,000		
67	Fullford	WTP FULLFORD	Structural	FEN	FEN, Fence, Perimeter	1	Perimeter fencing is required to secure the water treatment facilities.	Treatment Plant	There is no perimeter fencing around the site.	5	1	A	N/A	2011	25	2036	Install perimeter fencing around WTP.	Refer to Item (1)		
68	Fullford	WTP FULLFORD	Structural	STR	STR, Structure, Foundation, Concrete	71.5 m²	Backfilling is required at the foundation slab for the pipe entry shed to prevent further erosion of grounds under concrete slab that could cause failure of the slab.	Treatment Plant	Foundation is a reinforced concrete foundation and slab on grade system.	2	1	A	A	2011	50	2061	Backfill is required at foundation slab	\$1,000		
69	Fullford	WTP FULLFORD	Structural	STR	STR, Structure, Wood Frame	71.5 m²	WTP Fullford houses the DAF water treatment system and is located on the same site as PST South Ridge. Fullford Water Treatment Plant (Main) is a single story wood frame structure on a concrete slab on grade foundation system.	Treatment Plant	Structure is a wood framed wall and roof system.	1	1	A	A	2011	50	2061				
							No structural issues were noted.													
70	Fullford	WTP FULLFORD	Structural	STR	STR, Structure, Cladding	71.5 m²	The caulking between the painted plywood and the cement siding at the electrical mast has failed and requires replacement to prevent damage to finishes and supporting structure.	Treatment Plant	The building is clad in cement based siding with a rainscreen system.	2	1	A	A	2011	25	2036	Replace cement siding at electrical mast on facility.	\$2,000		
71	Fullford	WTP FULLFORD	Structural	STR	STR, Structure, Openings, Exterior	71.5 m²	Door mules are required to prevent door to frame contact. Door contactors for alarm system require replacement with roller type devices.	Treatment Plant	There are no windows in the building. Doors are insulated metal with metal frames and emergency hardware.	2	1	A	A	2011	25	2036	Install door mules and replace roller type alarm system.	\$5,000		
72	Fullford	WTP FULLFORD	Structural	STR	STR, Structure, Roof	71.5 m²	The roof system is sloped with asphalt shingle roofing and metal gutters. Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure. Rear gutters requires replacement due to damage.	Treatment Plant	Roof is an asphalt shingle system with metal gutters and downspouts.	2	1	A	A	2011	25	2036	Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure. Replace rear gutters.	\$10,000		
73	Fullford	WTP FULLFORD	Structural	STR	STR, Structure, Finishes, Interior	71.5 m²	No issues were noted with interior finishes.	Treatment Plant	Walls and ceiling are covered in painted plywood sheathing. Floor is an exposed concrete slab.	1	1	A	A	2011	15	2026				
74	Fullford	WTP FULLFORD	Structural	STR	STR, Structure, Cabinets	1	No issues were noted with the cabinets.	Treatment Plant	Cabinets are MDF with a laminate counter top.	1	1	A	N/A	2011	15	2026				
75	Fullford	WTP FULLFORD	Structural	LAD	LAD, Stairs, Interior, Aluminum	1	No issues were noted with the interior stairs and landing. Access stairs are required to provide safe access to the building level from the parking area to prevent slipping in wet and/or freezing weather.	Treatment Plant	Aluminum stairs and landing are attached to the DAF packaged treatment system. There are no exterior stairs.	3	1	A	N/A	2011	25	2036				
76	Fullford	WTP FULLFORD	Structural	RAI	RAI, Railing, Exterior	1	No issues were noted with exterior guardrails.	Treatment Plant	A pipe guardrail is installed on top of retaining wall to reduce falling hazard.	1	1	A	N/A	2011	25	2036				
77	Fullford	WTP FULLFORD	Structural	RAI	RAI, Railing, Interior	1	No issues were noted with interior handrails / guardrails.	Treatment Plant	Aluminum handrails / guardrails are attached to the DAF packaged treatment system.	1	1	A	N/A	2011	25	2036				
78	Fullford	WTP FULLFORD	Structural	DAV	DAV, Lifting Dault	0	Support for a lifting apparatus is required at ceiling level to lift the 80th rd for the Sluiceway. Support for a confined space entry apparatus is required over the DAF treatment system to accommodate entry for cleaning and servicing.	Treatment Plant	There are no provisions for lifting.	4	1	A	N/A	2011	25	2036	Support for a lifting apparatus is required at ceiling level to lift the 80th rd for the Sluiceway. Support for a confined space entry apparatus is required over the DAF treatment system to accommodate entry for cleaning and servicing.	\$25,000		
79	Fullford	WTP FULLFORD	Structural	HVAC	HVAC, Exhaust System	0	There is a requirement for a washroom facility on site. A mechanical exhaust system is required to extract blue green opavoids produced by blue green algae in the summer months.	Treatment Plant	There is a wash up sink installed. There is no washroom facility. There is no building exhaust system.	4	1	A	N/A	2011	25	2036	There is a requirement for a washroom facility on site. A mechanical exhaust system is required to extract blue green opavoids produced by blue green algae in the summer months.	\$6,000		
80	Fullford	WTP FULLFORD	Structural	ELC	ELC, Heater	1	Heating is provided by electric unit heaters and baseboard heaters. There is no emergency generator to operate emergency systems in case of a power outage.	Treatment Plant	The building is heated with electric unit heaters.	1	1	A	N/A	2011	25	2036				
81	Fullford	WTP FULLFORD	Structural	SAF	SHOEXT, emergency eye wash station, fire extinguisher	1	Emergency wash station and fire extinguisher are serviced on a regular basis. There is a hot water tank to provide tempered water to the emergency eye wash station and wash up area.	Treatment Plant	There is a packaged emergency deluge shower and eye wash station. There is a fire extinguisher installed.	1	1	A	N/A	2011	25	2036	Install hot water tank to temper water provided for eye wash station.	\$3,000		
<div>1. Very Good: Asset is physically sound, performing its function as originally intended. Generally a new or recently rehabilitated. Only planned maintenance required.</div> <div>2. Good: Asset is physically sound, performing its function as originally intended. Required maintenance costs as with acceptable standards but increasing. Asset has been used for some time but is within mid stage of expected life.</div> <div>3. Fair: Asset is showing signs of deterioration, performing at a lower level than originally intended. Some components are becoming physically deficient. Required maintenance costs exceed acceptable standards and increasing. Asset within the later stages of expected life.</div> <div>4. Poor: Asset is showing significant signs of deterioration, performance much lower than originally intended. Majority of asset is physically deficient. Required maintenance costs significantly exceed acceptable standards. Asset is approaching end of expected life.</div> <div>5. Very Poor: Asset is physically unsound and/or not performing as originally intended. Asset has higher probability of failure or failure is imminent. Maintenance costs are unacceptable. Replacement / major refurbishment required.</div>																				
<div>Asset Criticality Rating</div> <div>1. Non-critical: Asset failure would not result in immediate problem.</div> <div>2. Asset Standby Equipment Available: Asset failure would result in replacement/repairs which could be completed relatively quickly.</div> <div>3. No equipment redundancy: Asset failure could result in moderately prolonged service interruption. Asset standby equipment not readily available.</div> <div>4. No Equipment Redundancy & Failure of equipment not monitored by alarm: Asset Failure could cause prolonged system interruption. Significant time and cost to get system back online.</div> <div>5. No Equipment Redundancy & Failure of equipment not monitored by alarm and/or immediate health & safety concerns: Asset Failure could cause prolonged system interruption. Significant time and cost to get system back online. Asset essential to health and safety requirements.</div>																				
<div>Asset Criticality Rating</div> <div>A - Highly Reliable: Data based on sound records, procedures, investigations and analysis. Documented properly and agreed as the best method of assessment. Dataset is complete. Accuracy estimated +- 2%.</div> <div>B - Reliable: Data based on sound records, procedures, investigations and analysis. Documented properly but has minor shortcomings, i.e. some data is old, missing, extrapolated. Dataset is complete. Accuracy estimated +- 10%.</div> <div>C - Uncertain: Data is based on sound records, procedures, investigations and analysis. Data is incomplete or unverified, or extrapolated. Dataset is substantially complete but up to 50% is extrapolated. Accuracy estimated +- 25%.</div> <div>D - Very Uncertain: Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy estimated +- 40%.</div> <div>E - Unknown: None or very little data held.</div>																				
<div>Capacity Adaptation Ranking System</div> <div>A - Excellent: The asset has the capacity to meet long-term demand up to 10 years</div> <div>B - Good: The asset has the capacity to meet medium-term demand up to 5 years</div> <div>C - Moderate: The asset has the capacity to meet short-term growth demands.</div> <div>D - Borderline: The asset has the capacity to meet short-term growth demands but experiences some shortfalls.</div> <div>E - Fail: The asset capacity is not meeting its current demand and experiencing frequent shortfalls.</div>																				

Item No.	Water System	Asset Name	Component	Object Types	Equipment Identifier			Equipment Location		System Description	Asset Ratings					Asset Service Life			Capital Project Recommendations and Cost Estimate				
					Equipment Description	Quantity	Comments	Location	Physical Condition		Criticality	Data Confidence	Capacity Adaptation	Date Installed	Service Life	Anticipated Replacement / Refurbishment Date	Recommended Upgrade / Replacement / Investigation Capital Projects	Estimated cost (in 2019 dollars)					
PST Sunnyside - 122 Sunnyside Drive																							
82	Failed	PST SUNNYSIDE	Mechanical	PS	PS, Pressure Station, Sunnyside PS	1	The PS is housing duplex pumps. Access to the PS is restricted due to confined space entry. The pump flow rate is 2.3 L/sec. due to shawed down impellers. Replacement of impellers is required to match the WTP processing capacity.	Valve Chamber	Booster lift station for raw water supply to the Fultord WTP	1	2	A	A				Replace impellers in pumps.	\$6,000					
83	Failed	PST SUNNYSIDE	Health & Safety	RAI	RAI, Railing	1	No protective barrier for a ~3 ft drop to the east of the electrical cabinet. A 4 m metal rail should be installed.	Valve Chamber	Railing	5	1	A	N/A				No protective barrier for a ~3 ft drop to the east of the electrical cabinet. A 4 m metal rail should be installed.	\$3,000					
84	Failed	PST SUNNYSIDE	Health & Safety	ACC	ACC, Access Hatch, Manhole Frame & Lid	1	Operations staff (NSSVD) noted that they bring their tripod and portable blower for access. CRD should have their own.	Valve Chamber	CPE Tripod and Winch	4	1	A	A				Recommended purchasing portable CPE tripod and winch to use at this station and others.	\$5,000					
85	Failed	PST SUNNYSIDE	Electrical	ELC	ELC, 70 Amp Combination Main & TVSS 120/240 Volt 1 phase	1	Pole mounted Hydro Meter. Tree trimming required around Hydro incoming pole and BC Hydro meter	Valve Chamber	Electrical Service/TVSS and BC Hydro meter	2	5	A	A	2010	30	2040	Tree trimming required around Hydro incoming pole and BC Hydro meter	\$2,000					
86	Failed	PST SUNNYSIDE	Electrical	STR	STR, Structure, Kiosk Enclosure	1	Requires housekeeping and Preventative Maintenance routines	Valve Chamber	Aluminum Kiosk	2	5	A	A	2010	30	2040	Provide housekeeping and Preventative Maintenance routines	\$2,500					
87	Failed	PST SUNNYSIDE	Electrical	STR	STR, Structure, Foundation, Kiosk	1	Mounted to underground Dry Pit	Valve Chamber	Kiosk foundation / base	2	5	A	A										
88	Failed	PST SUNNYSIDE	Electrical	SCA	SCA, SCADA Panel 350	1		Valve Chamber	Site control process Scada & Scada communications	2	5	A	A	2010	30	2040							
89	Failed	PST SUNNYSIDE	Electrical	ANT	ANT, Antenna, GE Trained 800 MHz	1		Valve Chamber	Communications radio antenna	2	5	A	A	2010	30	2040							
90	Failed	PST SUNNYSIDE	Electrical	VFD	VFD, Variable Frequency Drive, Booster P1 and P2	2	Eaton VFD, MMX model no longer supported	Valve Chamber	Booster Pump VFD	2	2	A	A	2010	15	2025	Eaton VFD, MMX model no longer supported. Investigate alternatives	\$5,000					
91	Failed	PST SUNNYSIDE	Electrical	FLT	FLT, Process Instruments, Float Switch	1		Valve Chamber	Chamber Flood Float	2	5	A	A	2010/2016	15	2025							
92	Failed	PST SUNNYSIDE	Electrical	LIT	LIT, Light, Fluorescent strip 3'	1		Valve Chamber	Lighting	2	1	A	N/A	2010	10	2020							
93	Failed	PST SUNNYSIDE	Electrical	LIT	LIT, Light, Begall Fluorescent 2 lamp T8 Vapour Proof	2	T8 Lamps considered outdated. LED replacement should be considered	Valve Chamber	Lighting	2	2	A	N/A	2010	10	2020	Replace T8 Lamps with LED Lighting	\$300					
94	Failed	PST SUNNYSIDE	Electrical	REC	REC, Receptacles	1		Valve Chamber	Receptacles	2	1	A	A	2010	10	2020							
95	Failed	PST SUNNYSIDE	Structural	SIT	SIT, Overall Site	1	Ongoing maintenance is being performed by CRD personnel. Ground cover is maintained on a regular basis. Tree trimming is required to allow access to the PCS and to clear the electrical meter located on the adjacent power pole.	Valve Chamber	Site is sloping and adjacent to a deep roadside ditch	2	1	A	N/A	1990	50	1950	Tree trimming is required to allow access to the PCS and to clear the electrical meter located on the adjacent power pole.	\$2,000					
96	Failed	PST SUNNYSIDE	Structural	PKG	PKG, Parking Lot	1	N/A	Valve Chamber	Parking is on the side of Sunnyside Drive.	1	1	A	N/A	1990	50	1950							
97	Failed	PST SUNNYSIDE	Structural	SER	SER, Service, Stormwater	1	No service issues were noted	Valve Chamber	Stormwater exits the site into a ditch along Sunnyside Drive.	2	1	A	N/A	1990	50	1950							
98	Failed	PST SUNNYSIDE	Structural	STR	STR, Structure, Foundation, Concrete	1	No foundation issues were noted	Valve Chamber	Foundation is a reinforced concrete foundation and slab on grade system.	2	1	A	A	1990	50	1950							
99	Failed	PST SUNNYSIDE	Structural	STR	STR, Structure, Underground Enclosure, Concrete	1	PRS Sunnyside is a reinforced concrete underground enclosure with a suspended slab concrete lid.	Valve Chamber	There is no structure over tank.	1	1	A	A	1990	50	1950							
100	Failed	PST SUNNYSIDE	Structural	STR	STR, Structure, Openings, Exterior	1	No issues noted on access hatch.	Valve Chamber	Access to the tank is by way of a secured access hatch.	2	1	A	A	1990	25	1925							
101	Failed	PST SUNNYSIDE	Structural	STR	STR, Structure, Roof	1	No issues were noted with the tank cover.	Valve Chamber	The tank is covered with a suspended slab roof/cover.	3	1	A	A	1990	25	1925							
102	Failed	PST SUNNYSIDE	Structural	STR	STR, Structure, Finishes, Interior	1	No issues were noted with interior finishes.	Valve Chamber	Interior walls are exposed concrete.	1	1	A	A	1990	15	1915							
103	Failed	PST SUNNYSIDE	Structural	LAD	LAD, Ladder, Aluminum	1	No issues were noted with the ladder.	Valve Chamber	Access into the tank is by way of an aluminum ladder with a safety pole.	3	1	A	N/A	1990	25	1925							
104	Failed	PST SUNNYSIDE	Structural	RAI	RAI, Railing, Exterior	1	Install a full height guardrail that still allows for access but prevents a fall hazard when working on the tank.	Valve Chamber	There is a low height railing located adjacent to the access hatch.	1	1	A	N/A	1990	25	1925	Install a full height guardrail that still allows for access but prevents a fall hazard when working on the tank.	Refer to item 103					
105	Failed	PST SUNNYSIDE	Structural	DAV	DAV, Lifting Deck	0	Provide securing for a portable hi-pod device.	Valve Chamber	There are no provisions for confined space entry.	4	1	A	N/A	1990	25	1925	Provide mount area for a portable hi-pod device.	Refer to item 104					
106	Failed	PST SUNNYSIDE	Structural	ELC	ELC, Heater	1	The controls are located in a premanufactured metal enclosure. See electrical for comments.	Valve Chamber	The tank is heated with an electric baseboard heater.	1	1	A	N/A	1990	25	1925							
1. Very Good: Asset is physically sound, performing its function as originally intended. Generally a new or recently rehabilitated. Only planned maintenance required 2. Good: Asset is physically sound, performing its function as originally intended. Required maintenance costs as within acceptable standards but increasing. Asset has been used for some time but is within mid stage of expected life. 3. Fair: Asset is showing signs of deterioration, performing at a lower level than originally intended. Some components are becoming physically deficient. Required maintenance costs exceed acceptable standards and increasing. Asset within the later stages of expected life. Asset Physically Condition Rating: 4. Poor: Asset is showing significant signs of deterioration, performance much lower than originally intended. Majority of asset is physically deficient. Required maintenance costs significantly exceed acceptable standards. Asset is approaching end of expected life. 5. Very Poor: Asset is physically unsound and/or not performing as originally intended. Asset has higher probability of failure or failure is imminent. Maintenance costs are unacceptable. Replacement / major refurbishment required						Asset Criticality Rating: 1. Non-critical: Asset failure would not result in immediate problem. 2. Asset Standby Equipment Available: Asset failure would result in replacement/repairs which could be completed relatively quickly. 3. No equipment redundancy: Asset failure could result in moderately prolonged service interruption. Asset standby equipment not readily available. 4. No Equipment Redundancy & Failure of equipment not monitored by alarm: Asset failure could cause prolonged system interruption. Significant time and cost to get system back online. 5. No Equipment Redundancy & Failure of equipment not monitored by alarm and/or immediate Health & Safety Concerns: Asset failure could cause prolonged system interruption. Significant time and cost to get system back online. Asset essential to health and safety requirements.						Data Confidence System A - Highly Reliable: Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete. Accuracy estimated +- 2% B - Reliable: Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, (i.e. some data is old, missing, extrapolated). Dataset is complete. Accuracy estimated +- 10% C - Uncertain: Data is based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated. Dataset is substantially complete but up to 50% is extrapolated. Accuracy estimated +- 25% D - Very Uncertain: Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy estimated +- 40% E - Unknown: None or very little data held						Capacity Adaptation Ranking System A - Excellent: The asset has the capacity to meet long-term demand up to 10 years B - Good: The asset has the capacity to meet medium-term demand up to 5 years C - Moderate: The asset has the capacity to meet short-term growth demands. D - Borderline: The asset has the capacity to meet short-term growth demands but experiences some shortfalls. E - Fail: The asset capacity is not meeting its current demand and experiencing frequent shortfalls.					

Item No.	Water System	Asset Name	Component	Object Types	Equipment Identifier			Equipment Location			Asset Ratings					Asset Service Life			Capital Project Recommendations and Cost Estimate	
					Equipment Description	Quantity	Comments	Location	System Description	Physical Condition	Criticality	Data Confidence	Capacity Adaptation	Date Installed	Service Life	Anticipated Replacement / Refurbishment Date	Recommended Upgrade / Replacement / Investigation Capital Projects (in 2019 dollars)	Estimated cost		
PRS Sunnyside - Sunny Side Drive																				
						1	In-line strainers are not installed in front of PRVs for protection from fire seals. Signs of corrosion are visible from piping.	Valve Building	PRV assembly in dual bypass/main configuration.	3	1	A	A				Install in-line strainers in front of PRV. Replace piping	\$5,000 \$7,000		
108	Fulford	PRS SUNNYSIDE	Health & Safety	EXT	EXT: Fire Extinguisher	1	No fire extinguisher observed / fire extinguisher required. The hydrant directly adjacent to PRS building.	Valve Building	Fire Extinguisher	5	4	A	N/A				Inspect Fire Extinguisher and replace if required.	\$200		
109	Fulford	PRS SUNNYSIDE	Structural	SIT	SIT: Overall Site	1	Ongoing maintenance is being performed by CRD personnel. Ground cover is maintained on a regular basis. Adjacent bushes require trimming to prevent damage to the wall system and finishes. Maintenance required on surrounding vegetation, including branches around overhead telecommunications.	Valve Building	Site is flat and covered with gravel.	2	1	A	N/A	2011	50	2061	Adjacent bushes require trimming to prevent damage to the wall system and finishes. Maintenance required on surrounding vegetation, including branches around overhead telecommunications.	\$2,000		
110	Fulford	PRS SUNNYSIDE	Structural	DWY	DWY: Driveway, Gravel	1	Gravel driveway is well maintained and accessible.	Valve Building	Gravel driveway is part of the overall site.	1	1	A	N/A	2011	50	2061				
111	Fulford	PRS SUNNYSIDE	Structural	PKG	PKG: Parking Lot	1	Gravel driveway is well maintained and accessible.	Valve Building	Parking is part of the driveway.	1	1	A	N/A	2011	50	2061				
112	Fulford	PRS SUNNYSIDE	Structural	SER	SER: Services, Stormwater	1	No servicing issues were noted.	Valve Building	Stormwater exits the site into a ditch along Sunnyside Drive.	1	1	A	N/A	2011	50	2061				
113	Fulford	PRS SUNNYSIDE	Structural	FEN	FEN: Fence, Perimeter	0	Perimeter fencing is required to secure the pump system.	Valve Building	There is no perimeter fencing around the site.	5	1	A	N/A	2011	25	2036	Perimeter fencing is required to secure the pump system.	\$15,000		
114	Fulford	PRS SUNNYSIDE	Structural	STR	STR: Structure, Foundation	10.3 m²	No issues were noted with the foundation.	Valve Building	Foundation is a reinforced concrete foundation and slab on grade system.	1	1	A	A	2011	50	2061				
115	Fulford	PRS SUNNYSIDE	Structural	STR	STR: Structure, Wood Frame	10.3 m²	PRV Sunnyside is a single-storey wood frame structure on a concrete slab on grade foundation system.	Valve Building	Structure is a wood framed wall and roof system.	1	1	A	A	2011	50	2061				
116	Fulford	PRS SUNNYSIDE	Structural	STR	STR: Structure, Cladding	10.3 m²	Exterior walls are covered in horizontal cementitious siding. No cladding issues were noted.	Valve Building	The building is clad in cement-based siding with a rainscreen system.	1	1	A	A	2011	25	2036				
117	Fulford	PRS SUNNYSIDE	Structural	STR	STR: Structure, Openings, Exterior	10.3 m²	Door requires painting and replacement of door sweep and weather stripping to prevent insects from entering the building. Prepare and paint all surfaces to the Master Panter Institute (MPI) Standards.	Valve Building	There are no windows in the building. Door is insulated metal with metal frame and emergency hardware.	2	1	A	A	2011	25	2036	Door requires painting and replacement of door sweep and weather stripping to prevent insects from entering the building. Prepare and paint all surfaces to the Master Panter Institute (MPI) Standards.	\$1,000		
118	Fulford	PRS SUNNYSIDE	Structural	STR	STR: Structure, Roof	10.3 m²	The roof system is sloped with asphalt shingle roofing and metal gutters. Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure.	Valve Building	Roof is an asphalt shingle system with metal gutters and downspouts.	2	1	A	A	2011	25	2036	Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure.	\$2,500		
119	Fulford	PRS SUNNYSIDE	Structural	STR	STR: Structure, Finishes, Interior	10.3 m²	Interior requires painting to prevent damage to the plywood finishes in case of a leak in the pumping system. Prepare and paint all surfaces to the Master Panter Institute (MPI) Standards.	Valve Building	Walls and ceiling are covered in painted plywood sheathing. Floor is an exposed concrete slab.	3	1	A	A	2011	15	2026	Interior requires painting to prevent damage to the plywood finishes in case of a leak in the pumping system. Prepare and paint all surfaces to the Master Panter Institute (MPI) Standards.	\$3,000		
120	Fulford	PRS SUNNYSIDE	Structural	SAF	EXT: Fire Extinguisher	0	Installation of a fire extinguisher is required.	Valve Building	There are no safety devices installed.	3	1	A	N/A	2011	25	2036	Installation of a fire extinguisher is required.	\$500		
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3. Fair: Asset is showing signs of deterioration, performing at a lower level than originally intended. Some components are becoming physically efficient. Required maintenance costs exceed acceptable standards and increasing. Asset within the later stages of expected life.																				
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Capital Regional District - Salt Spring Island Electoral Area
Strategic Asset Management Plans for Local Water Services
FULFORD WATER SYSTEM - ASSET CONDITION ASSESSMENT

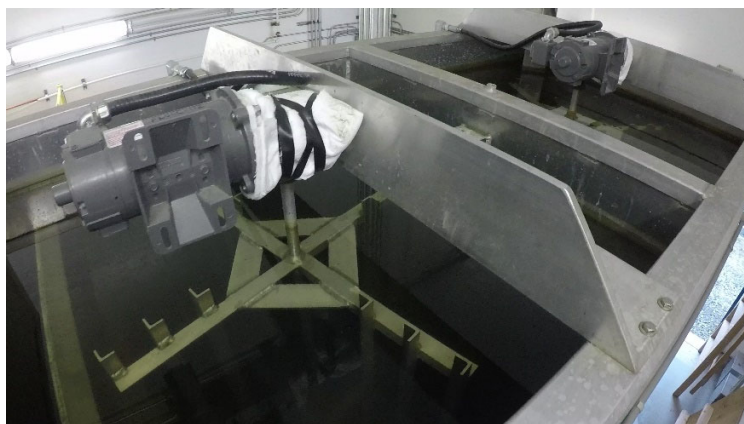
Item No.	Water System	Asset Name	Component	Object Types	Equipment Identifier			Equipment Location		Asset Ratings					Asset Service Life			Capital Project Recommendations and Cost Estimate	
					Equipment Description	Quantity	Comments	Location	System Description	Physical Condition	Criticality	Data Confidence	Capacity Adaptation	Date Installed	Service Life	Anticipated Replacement / Refurbishment Date	Recommended Upgrade / Replacement / Investigation Capital Projects	Estimated cost (in 2019 dollars)	
Distribution Fulford																			
121	Fulford	DISTRIBUTION FULFORD	Coil	V/LV	V/LV, Air Valves	5	All air valves on supply main not observed / visible - limited access. Trail should have vegetation maintenance for access.	from Weston Lake to PST Sunnyside	Air valves on supply main	2	3	A	A	2008			Trail should have vegetation maintenance for access.	\$2,000	
122	Fulford	DISTRIBUTION FULFORD	Coil	STP	STP, Standpipe	12	All standpipes should have cap on outlet. Trail should have vegetation maintenance for access.	from Weston Lake to PST Sunnyside	Standpipes along supply main	2	1	A	A	2008	50	2058	All standpipes should have cap on outlet.	\$500	
123	Fulford	DISTRIBUTION FULFORD	Coil	INT	INT, intake strainer, stainless steel	1	Strainer recently maintained / cleaned. Need underwater diving inspections, never done.	Weston Lake	Water intake strainer at water source	1	4	A	A	2008	50	2058	Strainer for water intake requires inspection. Underwater inspection on raw water intake should be done.	\$10,000	
124	Fulford	DISTRIBUTION FULFORD	Coil	WM	WM, Wateman, Raw, 100 mm, PVC	~2,215 m	Watemans should be flushed annually. Air valves (5 ea.) should be replaced.	from Weston Lake to PST Sunnyside	Supply wateman	2	5	A	A	2008	75	2083			
125	Fulford	DISTRIBUTION FULFORD	Coil	WM	WM, Wateman, Raw, 150 mm, PVC, C900, Blue Buile	~730 m	Wateman should be flushed annually.	from PST Sunnyside to WTP Fulford	Supply wateman	2	5	A	A	2008	75	2083	Air valves should be replaced.	\$9,000	
126	Fulford	DISTRIBUTION FULFORD	Coil	BLD	BLD, Building, Raw, Meter	1	Building should be removed and underground chamber installed to contain raw water meter.	from Weston Lake to PST Sunnyside	Building for raw water meter	5	1	A	A		30		Demolish and replace existing building with underground chamber.	\$25,000	
127	Fulford	DISTRIBUTION FULFORD	Coil	SER	SER, Service, Water Service	1	Water service to 341 Reynolds Rd directly from RAW supply main with no treatment. Suggest CRD do further investigation to determine if water is to be treated or not or if the homeowner has a private treatment system.	341 Reynolds Rd	Wateman service	5	5	A	D		50		Water service to 341 Reynolds Rd directly from RAW supply main with no treatment. Suggest CRD do further investigation to determine if water is to be treated or not or if the homeowner has a private treatment system.	\$5,000	
128	Fulford	DISTRIBUTION FULFORD	Coil	WM	WM, Wateman, 50 mm, AC	123 m	- Wateman should have maintenance flushing schedule.	Local Water Service	Distribution wateman	2	5	A	D	1980	50	2030	Wateman to be replaced with new services (+ 6 years). Cost based on \$500 /m	\$61,500	
129	Fulford	DISTRIBUTION FULFORD	Coil	WM	WM, Wateman, 100 mm, AC	4,391 m	- Wateman should have maintenance flushing schedule.	Local Water Service	Distribution wateman	2	5	A	D	1970	50	2020	Wateman to be replaced with new services (+ 1 year). Cost based on \$650 /m	\$2,900,000	
130	Fulford	DISTRIBUTION FULFORD	Coil	WM	WM, Wateman, 50 mm, PVC	68 m	- Wateman should have maintenance flushing schedule.	Local Water Service	Distribution wateman	2	5	A	D	1980	75	2055			
131	Fulford	DISTRIBUTION FULFORD	Coil	WM	WM, Wateman, 50 mm, PVC	46 m	- Wateman should have maintenance flushing schedule.	Local Water Service	Distribution wateman	2	5	A	D	2006	75	2081			
132	Fulford	DISTRIBUTION FULFORD	Coil	WM	WM, Wateman, 100 mm, PVC	1,126 m	- Wateman should have maintenance flushing schedule.	Local Water Service	Distribution wateman	2	5	A	D	2008	75	2083			
133	Fulford	DISTRIBUTION FULFORD	Coil	WM	WM, Wateman, 150 mm, PVC	937 m	- Wateman should have maintenance flushing schedule.	Local Water Service	Distribution wateman	2	5	A	A	2006	75	2081			
134	Fulford	DISTRIBUTION FULFORD	Coil	HYD	HYD, Hydrant	4	- Hydrants should be exercised annually.	Local Water Service	Hydrants along distribution main	2	1	A	A						
135	Fulford	DISTRIBUTION FULFORD	Coil	STP	STP, Standpipe	12	- All standpipes should have cap on outlet.	Local Water Service	Standpipes along distribution main	2	1	A	A				All standpipes should have cap on outlet.	\$500	
136	Fulford	DISTRIBUTION FULFORD	Health & Safety	SHO	SHO, Eyewash, Portable	1	Distilled water to be replaced on a regular basis.	Supply Main Building Reynolds Rd	Personal protective equipment	1	1	A	N/A						
137	Fulford	DISTRIBUTION FULFORD	Electrical	ELC	ELC, 60 Amp customer owned pole, BC Hydro meter 120/240 Volt, 1 phase	1	Pole mounted Hydro Meter. Customer owned Pole mounted service has safety concerns with buried cable to head building.	Supply Main Building Reynolds Rd	Electrical service and BC Hydro meter	5	1	A	A	<1991	25	2016			
138	Fulford	DISTRIBUTION FULFORD	Electrical	ELC	ELC, 60 Amp Panel 120/240 Volt, 1 phase	1	External Mounted Panelboard. External mounted panel has safety concerns with moisture, access and security, vandalism and poor condition.	Supply Main Building Reynolds Rd	Electrical Panel main service	5	1	A	A	<1991	25	2016			
139	Fulford	DISTRIBUTION FULFORD	Electrical	ELC	ELC, Light, Heat, Receptacles	1	Equipment severely corroded.	Supply Main Building Reynolds Rd		5	1	A	A	<1991	15	2006	Replace lighting, heating, and receptacles in building.	\$1,000	
140	Fulford	DISTRIBUTION FULFORD	Electrical	SAF	SAF, Safety Code	3	Electrical condition of building lights, heat and receptacles are in very poor condition and have safety concern, grounding and corrosion. Recommend removal or replacement. Ongoing maintenance is being performed by CRD personnel around the site.	Supply Main Building Reynolds Rd		1	1	A	A	1900	50		Replace severely corroded equipment.	\$5,000	
141	Fulford	DISTRIBUTION FULFORD	Structural	SIT	SIT, Overall Site	1	Ground cover is maintained on a regular basis.	Supply Main Building Reynolds Rd	Site is flat approximately 40m into the bushes.	1	1	A	N/A	1900	50	1950			
142	Fulford	DISTRIBUTION FULFORD	Structural	PTH	PTH, Access Pathway	1	Access path is well maintained and accessible.	Supply Main Building Reynolds Rd	There is no driveway. Access is by way of a path.	1	1	A	N/A	1900	50	1950			
143	Fulford	DISTRIBUTION FULFORD	Structural	PKG	PKG, Parking Lot	1	N/A	Supply Main Building Reynolds Rd	Parking is on Reynolds Road.	1	1	A	N/A	1900	50	1950			
144	Fulford	DISTRIBUTION FULFORD	Structural	SER	SER, Service, Stormwater	1	N/A	Supply Main Building Reynolds Rd	Storm drainage is to the adjacent swamp area.	1	1	A	N/A	1900	50	1950			
145	Fulford	DISTRIBUTION FULFORD	Structural	STR	STR, Structure, Foundation, Concrete	6.0 m ²	No issues were noted with the foundation. Demolish building.	Supply Main Building Reynolds Rd	Foundation is a reinforced concrete foundation and slab on grade system.	1	1	A	A	1900	50	1950	Demolish existing building.	Refer to Item 126	
146	Fulford	DISTRIBUTION FULFORD	Structural	STR	STR, Structure, Wood Frame	6.0 m ²	Reynolds road strainer building is a single story wood frame structure on a concrete slab on grade foundation system.		Structure is a wood framed wall and roof system.	5	1	A	A	1900	50	1950	Demolish existing building.	Refer to Item 126	
147	Fulford	DISTRIBUTION FULFORD	Structural	STR	STR, Structure, Cladding	6.0 m ²	Exterior walls are covered in vertical cedar siding. Cladding is rotting and has exceeded its estimated service life. Demolish building.	Supply Main Building Reynolds Rd	The building is clad in vertical cedar siding.	5	1	A	A	1900	25	1925	Demolish existing building.	Refer to Item 126	
148	Fulford	DISTRIBUTION FULFORD	Structural	STR	STR, Structure, Openings, Exterior	6.0 m ²	N/A	Supply Main Building Reynolds Rd	The one window in the building has been boarded over. The entry door is wood.	5	1	A	A	1900	25	1925			
149	Fulford	DISTRIBUTION FULFORD	Structural	STR	STR, Structure, Roof	6.0 m ²	The roof system is sloped asphalt with no gutters. Roof should be demolished as part of the overall building.	Supply Main Building Reynolds Rd	Roof is covered with a tarp and leaking.	5	1	A	A	1900	25	1925	Demolish existing building.	Refer to Item 126	

APPENDIX D

FULFORD ASSET PHOTO OBSERVATION SHEETS

Local Water Service		
FULFORD LOCAL WATER SERVICE		

Asset	Component	Location
WTP Fulford	Mechanical	203 South Ridge Drive



Description:

Fulford Water Treatment Plant

Observation:

Top of the rapid mix and flocculation tanks. Both mixer motors are leaking. Temporary fix implemented by wrapping the motors with fabric cloths. Drip trays are required to prevent oil from dripping into the rapid mix/flocculation tanks.



Description:

Fulford Water Treatment Plant

Observation:

Top of the rapid mix and flocculation tanks. Both mixer motors are leaking. Temporary fix implemented by wrapping the motors with fabric cloths. Drip trays are required to prevent oil from dripping into the rapid mix/flocculation tanks.



Description:




Fulford Water Treatment Plant

Observation:

Top of the dissolved air flotation (DAF) unit. Single unit only.

The WTP processing capacity is 4.5 L/sec (16.2 m³/hr).

Asset	Component	Location
WTP Fulford	Mechanical	203 South Ridge Drive

	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Observation:
	DAF duplex pressurization pumps and duplex compressor sitting on top of the air tank. Vertical pressurization vessel (blue) is seen on the left-hand side. The assembly is an integral part of the package WTP.
	Observation:
	DAF outlet manifold on the right-hand side in the background and air scour blower used for filter backwash in the foreground. DAF pressurization system on the left-hand side in the background is an integral part of the package WTP.
	Observation:
	Pressurized single UV disinfection module.

Asset	Component	Location
WTP Fulford	Mechanical	203 South Ridge Drive

	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Observation:
	DAF outlet manifold with the original valve actuators recently replaced with new Rotork actuators (blue).
	Observation:
	Effluent (filter) turbidimeters; one for each filter.
	Observation:
	Coagulant storage tank (right-hand side) and coagulant mix tank (left-hand side).

Asset	Component	Location
WTP Fulford	Mechanical	203 South Ridge Drive

	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Observation:
	Duplex chemical (coagulant) dosing pumps.
	Observation:
	Emergency eye wash and shower station located next to chemical storage/mix tanks.
	Observation:
	Coagulant storage tank (right-hand side) and coagulant mix tank (left-hand side).

Asset	Component	Location
WTP Fulford	Mechanical	203 South Ridge Drive

	<p>Description:</p> <p>Fulford Water Treatment Plant</p>
	<p>Observation:</p> <p>EOCP facility classification as a small water system.</p>
	<p>Description:</p> <p>Fulford Water Treatment Plant</p>
	<p>Observation:</p> <p>External tank collecting DAF float/scum.</p>
	<p>Description:</p> <p>Fulford Water Treatment Plant</p>
	<p>Observation:</p> <p>External tanks.</p>

Asset	Component	Location
WTP Fulford	Mechanical	203 South Ridge Drive



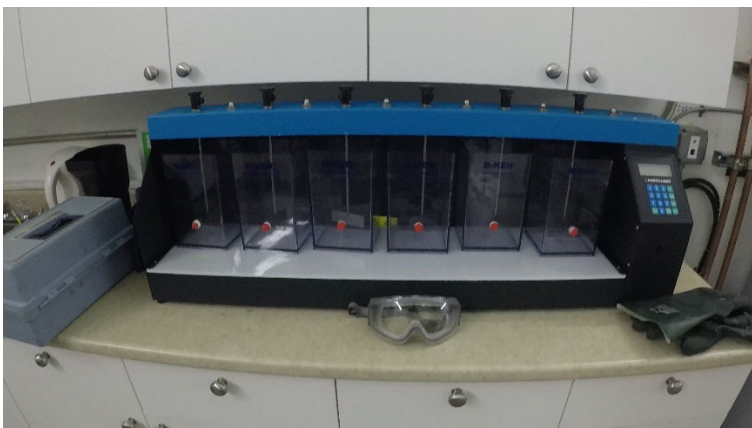
Description:
Fulford Water Treatment Plant

Observation:
Raw water influent flow meter.



Description:
Fulford Water Treatment Plant




Observation:
Process control panel with HMI. The WTP has PLC control system for fully automatic operation.






Description:
Fulford Water Treatment Plant

Observation:
Jar testing equipment shared with Beddis WTP.

Asset	Component	Location
WTP Fulford	Mechanical	203 South Ridge Drive


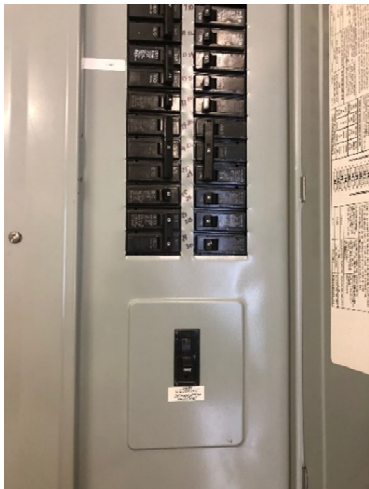

	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Observation:
	Loop system for the clear well and chlorine monitoring equipment.
	Observation:
	Chlorine room with a single chlorine pump and eye wash station (green) on the right-hand side.
	Observation:
	Single chlorine recirculation pump.



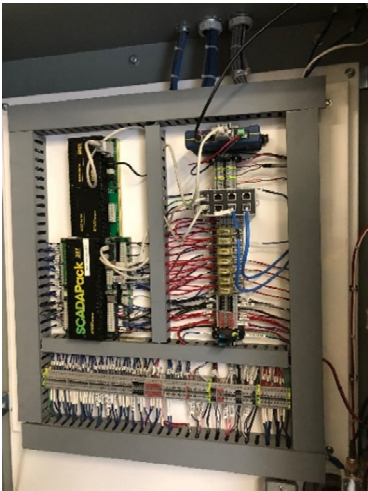
Asset	Component	Location
WTP Fulford	Mechanical	203 South Ridge Drive




	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Description:
	Fulford Water Treatment Plant
	Observation:
	Duplex effluent pumps enclosed in a sound insulation box.
	Observation:
	Duplex backwash and rinse water recycle pumps.
	Observation:
	Duplex effluent filters with automatic valves. The WTP processing capacity is 4.5 L/sec (16.2 m ³ /hr).

Asset	Component	Location
WTP Fulford	Civil	203 South Ridge Drive




	Description:
	Eyewash and Drench Shower
	Observation: Eyewash and drench shower station too situated close to filing cabinet. Suggest to relocation filing cabinet.
	Description:
	Isopac Containers
	Observation: Containers to have dedicated storage and free of tripping hazards.
	Description:
	Fire Extinguisher
	Observation: Fire extinguisher is expired and requires inspection.
	CRD Personnel Observation:
	No issues noted

Asset	Component	Location
WTP Fulford	Electrical	203 South Ridge Drive
		Description:
		DAF Process Control Panel
		Observation: Safety concerns, no ability to reset motor overloads without opening the Control Panel
		Description:
		Electrical Main Service Panel
		Observation: Panel Directory needs to be finalized
		Description:
		DC UPS
		Observation: No issues noted
		CRD Personnel Observation:
		No issues noted


Asset	Component	Location
WTP Fulford	Electrical	203 South Ridge Drive
	Description:	AC UPS
	Observation:	No issues noted
	CRD Personnel Observation:	No issues noted
	Description:	Surge Suppression TVSS
	Observation:	No issues noted
	CRD Personnel Observation:	No issues noted
	Description:	Process Scada and Communications
	Observation:	No issues noted
	CRD Personnel Observation:	No issues noted

Asset	Component	Location
WTP Fulford	Electrical	203 South Ridge Drive
		Description:
		Main Service and Radio Mast
		Observation:
		No issues noted
		Description:
		Fan Forced Unit Heater
		Observation:
		No issues noted
		Description:
		Site Main Incoming Electrical Service
		Observation:
		Panel Directory needs to be finalized
		CRD Personnel Observation:

Asset	Component	Location
WTP Fulford	Electrical	203 South Ridge Drive

	Description:	Fan Forced Unit Heater
	Observation:	No issues noted
	CRD Personnel Observation:	No issues noted
	Description:	Booster Pump VFD's
	Observation:	Eaton model MVX no longer supported.
	CRD Personnel Observation:	No issues noted
	Description:	Recycle Pump Starters
	Observation:	No issues noted
	CRD Personnel Observation:	No issues noted

Asset	Component	Location
WTP Fulford	Electrical	203 South Ridge Drive

	Description:
	Storage Tanks
	<p>Observation:</p> <p>Onsite storage tanks have exposed cabling for level transducers and floats, all subject to vandalism.</p>
<p>CRD Personnel Observation:</p> <p>No issues noted</p>	

Asset	Component	Location
WTP Fulford	Structural	203 South Ridge Drive




	Description:
	WTP Fulford (background) with PST South Ridge (foreground).
	<p>Observation:</p> <p>Grounds are well maintained. Fencing is required around the entire site.</p>
<p>CRD Personnel Observation:</p> <p>No issues noted</p>	

	Description:
	Side of WTP Fulford
	<p>Observation:</p> <p>Main access route to building with no stairs for safe access. Trees to the rear of the building require trimming to avoid damage to the roof and adjacent finishes.</p>
<p>CRD Personnel Observation:</p> <p>No issues noted</p>	

Asset	Component	Location
WTP Fulford	Structural	203 South Ridge Drive

	Description:
	Side of Water Treatment Building
	Observation: Plywood patch at electrical meter requires painting and replacement of failed caulking.
	Description:
	Side of Water Treatment Building
	Observation: Roof requires removal of moss. Upper gutter requires replacement due to damage.
	Description:
	Rear of Water Treatment Building
	Observation: Rainwater from roof has eroded the soils away from the slab on grade.
	CRD Personnel Observation:
	No issues noted

Asset	Component	Location
WTP Fulford	Structural	203 South Ridge Drive

	Description:
	Front of Water Treatment Building
	<p>Observation:</p> <p>Replacement of door alarm device and installation of weather stripping and/or door mutes is required to eliminate false alarms in stormy weather.</p>
	Description:
	Inside Water Treatment Building
	<p>Observation:</p> <p>Fire extinguishers, emergency eyewash, and emergency lighting equipment are serviced on a regular basis.</p>
	Description:
	Inside Water Treatment Building
	<p>Observation:</p> <p>Support for a lifting apparatus is required at ceiling level to lift the 80lb lid for the Saturator. Support for a confined space entry apparatus is required over the DAF treatment system to accommodate entry for cleaning and servicing.</p>
CRD Personnel Observation:	
No issues noted	

Asset	Component	Location
WTP Fulford	Structural	203 South Ridge Drive



Description:

WTP Fulford (background) with
PST South Ridge (foreground)

Observation:

Grounds are well maintained.
Fencing is required around the
entire site.

CRD Personnel Observation:

No issues noted



Description:

Front of Pump Station Building

Observation:

No issues noted

CRD Personnel Observation:

No issues noted



Description:

Side of Pump Station Building

Observation:

Roof requires removal of moss.



CRD Personnel Observation:

No issues noted



Asset	Component	Location
WTP Fulford	Structural	203 South Ridge Drive

	Description:
	Rear of Pump Station Building
	<p>Observation:</p> <p>Roof requires removal of moss. Fencing is required to protect tampering of valves at adjacent tanks.</p>
	Description:
	Front of Pump Station Building
	<p>Observation:</p> <p>Replacement of door alarm device and installation of weather stripping and/or door mutes is required to eliminate false alarms in stormy weather.</p>
	Description:
	Interior of Pump Station Building
	<p>Observation:</p> <p>Fire extinguishers, emergency eyewash, and emergency lighting equipment are serviced on a regular basis.</p>
CRD Personnel Observation:	
No issues noted	


Asset	Component	Location
WTP Fulford	Structural	203 South Ridge Drive

	Description:
	Inside of chlorine room
	Observation: Eyewash station is serviced on a regular basis. There is no hot water to temper the water.
	CRD Personnel Observation:
	No issues noted
	Description:
	Chlorine Room in Pump Station Building
	Observation: Inside of chlorine room. Exhaust fan is functional. There is a chlorine containment spill tank installed.
	CRD Personnel Observation:
	No issues noted

Asset	Component	Location
WTP Fulford	Mechanical	195 South Ridge Drive

	<p>Description:</p> <p>Fulford Water Reservoir</p>
	<p>Observation:</p> <p>View of the 80,000 Imp. gallon (360 m³) bolted steel water tank at an elevation of approximately 90 masl.</p>
	<p>Description:</p> <p>Fulford Water Reservoir</p>
	<p>Observation:</p> <p>Side hatch on the wall of the 80,000 Imp. gallon (360 m³) bolted steel water tank.</p>
	<p>Description:</p> <p>Fulford Water Reservoir</p>
	<p>Observation:</p> <p>Access to the top of the 80,000 Imp. gallon (360 m³) bolted steel water tank.</p>

Asset	Component	Location
WTP Fulford	Mechanical	195 South Ridge Drive

	Description:
	Fulford Water Reservoir
	<p>Observation:</p> <p>Access to the top of the 80,000 Imp. gallon (360 m³) bolted steel water tank.</p>


Asset	Component	Location
WTP Fulford	Structural	195 South Ridge Drive

	Description:
	RES Fulford packaged reservoir tank
	<p>Observation:</p> <p>Grounds are well maintained. Fencing is required around the entire site.</p>
	CRD Personnel Observation:
	No issues noted
	Description:
	Access path from school below.
	<p>Observation:</p> <p>Grounds are well maintained.</p>
	CRD Personnel Observation:
	No issues noted







Asset	Component	Location
WTP Fulford	Structural	195 South Ridge Drive

	Description:
	Farm side of reservoir.
	Observation: Farmers fence beside tank is damaged and not adequate to provide security at tank. Fencing is required around the entire site.
	Description:
	Access to ladder.
	Observation: Security hatch at the bottom of the access ladder requires new lock.
	CRD Personnel Observation:
	No issues noted


Asset	Component	Location
WTP Fulford	Mechanical	Reynolds Rd

	Description:
	Raw Water Flow Meter Shed
	Observation: View of the shed housing a raw water meter and strainer assembly. The asset was previously used for chlorination of raw water supply. Currently, it is used for flow metering and leak detection in the raw water supply line.



Asset	Component	Location
WTP Fulford	Mechanical	Reynolds Rd

	Description:
	Raw Water Flow Meter Shed
	Observation:
	Entrance door to the shed. The shed is in poor structural condition.
	Description:
	Raw Water Flow Meter Shed
	Observation:
	Shed interior. Signs of valve corrosion are visible.
	Description:
	Raw Water Flow Meter Shed
	Observation:
	Shed interior. Signs of valve corrosion are visible.



Asset	Component	Location
WTP Fulford	Mechanical	Reynolds Rd



	Description:
	Raw Water Flow Meter Shed
	Observation: Shed interior. Signs of valve corrosion are visible.



Asset	Component	Location
WTP Fulford	Electrical	Reynolds Rd

	Description:
	Site Main Incoming Electrical Service
	Observation: Service mounted external to building, exposed to vandalism. Safety and Electrical code concerns with installation
	Description:
	Pole mounted BC Hydro meter
	Observation: Feeder burial depth not to minimum 450 mm, Safety and Electrical code concerns with installation
	CRD Personnel Observation:
	No issues noted


Asset	Component	Location
WTP Fulford	Structural	Reynolds Rd

	Description:
	Strainer Building.
	Observation:
	Roof is leaking and exterior finishes have exceeded life expectancy.
	CRD Personnel Observation:
	No issues noted


	Description:
	Ceiling of Strainer Building.
	Observation:
	Ceiling is rotting with signs of mould. Building should be demolished.
	CRD Personnel Observation:
	No issues noted

	Description:
	Interior of Strainer Building.
	Observation:
	Space heater is being used as baseboard heater is not operational.
	CRD Personnel Observation:
	No issues noted




Asset	Component	Location
PRS Sunnyside	Mechanical	122 Sunnyside Drive

	Description:
	Sunnyside Pump Station
	<p>Observation:</p> <p>Top view of a booster duplex pump station feeding the water treatment plant. Access to the pump station is restricted due to confined space entry.</p>


Asset	Component	Location
PRS Sunnyside	Civil	122 Sunnyside Drive

	Description:
	Railing
	<p>Observation:</p> <p>Protective railing to be installed on the south side of the underground chamber, as there is an approximate 600 mm drop into a ditch on this side of the chamber.</p>
	<p>CRD Personnel Observation:</p> <p>No issues noted</p>



Asset	Component	Location
PRS Sunnyside	Electrical	122 Sunnyside Drive

	Description:
	Site Main Incoming Electrical Service
	Observation: Annual house keeping, vacuum enclosure needs to be preformed along with kiosk maintenance plans.
	Description:
	Booster Pump VFD's
	Observation: Eaton model MVX no longer supported.
	Description:
	Pole mounted BC Hydro meter
	Observation: Tree trimming needs to be performed
	CRD Personnel Observation:
	No issues noted



Asset	Component	Location
PRS Sunnyside	Electrical	122 Sunnyside Drive

	Description:
	Scada and Radio communications
	Observation: Radio antenna needs tree trimming performed
	CRD Personnel Observation: No issues noted


Asset	Component	Location
PRS Sunnyside	Structural	122 Sunnyside Drive

	Description:
	PRS controls enclosure on concrete tank.
	Observation: Guardrail is not high enough to provide adequate fall protection.
	CRD Personnel Observation: No issues noted
	Description:
	Electrical meter on the power pole.
	Observation: Adjacent trees require trimming.
	CRD Personnel Observation: No issues noted

Asset	Component	Location
PRS Sunnyside	Structural	122 Sunnyside Drive

	Description:
	Access hatch to the tank.
	Observation: Some rusting is occurring. Recommend cleaning of rust and painting.
	Description:
	Ladder to the tank.
	Observation: Access ladder has safety post as per requirements. Access is considered confined space and requires lifting apparatus for personnel.
	CRD Personnel Observation:
	No issues noted

Asset	Component	Location
PST Sunnyside	Mechanical	Sunnyside Drive

	Description:
	Sunnyside PRV Station
	Observation: View of the PRV station in dual bypass/main configuration. In-line strainers are not installed in front of PRVs for protection from fine solids.


Asset	Component	Location
PST Sunnyside	Mechanical	Sunnyside Drive

	Description:
	Sunnyside PRV Station
	Observation:
	Signs of corrosion are visible on galvanized piping.


	Description:
	Sunnyside PRV Station
	Observation:
	Signs of corrosion are visible.

	Description:
	Sunnyside PRV Station
	Observation:
	Signs of corrosion are visible.

Asset	Component	Location
PST Sunnyside	Mechanical	Sunnyside Drive

	Description:
	Sunnyside PRV Station
	Observation: Signs of corrosion are visible.


Asset	Component	Location
PST Sunnyside	Civil/Health & Safety	Sunnyside Drive

	Description:
	Fire Extinguisher
	Observation: A fire extinguisher should be installed inside the building.
	CRD Personnel Observation: No issues noted





Asset	Component	Location
PST Sunnyside	Structural	Sunnyside Drive

	Description:
	Pumphouse.
	Observation: Moss control is required on the roof.
	Description:
	Rear of pumphouse.
	Observation: Adjacent bushes require trimming.
	Description:
	Access door to pumphouse.
	Observation: Some rusting is occurring. Access door requires painting and replacement of weather stripping.
	CRD Personnel Observation: No issues noted

Asset	Component	Location
PST Sunnyside	Structural	Sunnyside Drive

	Description:
	Ceiling of pumphouse.
	Observation:
	Staining is from a previous leak in the system. Interior plywood finishes require repainting.
	CRD Personnel Observation:
	No issues noted

Asset	Component	Location
Distribution Fulford	Civil	Fulford Area

	Description:
	Standpipe
	Observation:
	In general, all standpipes should have cap on outlet.
	Description:
	Eye Wash Station
	Observation:
	No issues noted. Raw water meter building is suggested to be decommissioned, as the building is deemed not safe.
	Description:
	Fire hydrant at 122 Sunnyside Drive
	Observation:
	Fire hydrants are in good condition but requires operational maintenance.
	CRD Personnel Observation:
	Fire hydrants have not been maintained.

APPENDIX E

FULFORD WATER SYSTEM RECOMMENDED CAPITAL PROJECTS TABLE

CRD Salt Spring Island Electoral Area
FULFORD WATER SYSTEM RECOMMENDED CAPITAL PROJECTS

Item No.	Condition Assessment Table Item No.	Asset Name	Evaluation Source	Description of Recommended Capital Project	Relevant Governing Principles	Timeline	Estimated Costs (in 2019 dollars)
1	1	WTP Fulford	Condition Assessment	Repair or replace both flocculator mixer motors	4, 6	Immediate to < 1 year	\$7,000
2	1	WTP Fulford	Condition Assessment	Install turbidity meters on influent line	4, 6	Immediate to < 1 year	\$2,000
3	1	WTP Fulford	Condition Assessment	Investigate feasibility of supply emergency power supply for WTP	2, 4, 6	Immediate to < 1 year	\$5,000
4	1	WTP Fulford	Condition Assessment	Purchase a spare chlorine dosing pump	6	Immediate to < 1 year	\$1,000
5	2	WTP Fulford	Condition Assessment CRD Staff Comments	Clean sediment from bottom of tank. Maintenance Schedule for clearing and inspection water tank required. Improve security fencing around the facility.	1, 2, 4, 6	Immediate to < 1 year	\$8,000
6	5	WTP Fulford	Condition Assessment	Maintenance should be done for path to Reservoir	2, 6	Immediate to < 1 year	\$5,000
7	7	WTP Fulford	Condition Assessment	Inspect Fire Extinguisher and replace if required.	2, 6	Immediate to < 1 year	\$200
8	8	WTP Fulford	Condition Assessment	Inspect Fire Extinguisher and replace if required.	2, 6	Immediate to < 1 year	\$200
9	9	WTP Fulford	Condition Assessment	Relocate Containers	2	Immediate to < 1 year	\$250
10	11	WTP Fulford	Condition Assessment	Replace First Aid Kit	2	Immediate to < 1 year	\$200
11	43	WTP Fulford	Condition Assessment	Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure.	4, 6	Immediate to < 1 year	\$4,000
12	60	WTP Fulford	Condition Assessment	Install new lock on metal hatch at the bottom of the tank's ladder	2	Immediate to < 1 year	\$100
13	63	WTP Fulford	Condition Assessment	Tree and bush trimming required around facility to prevent damage to facility roofing and finishing.	4, 6	Immediate to < 1 year	\$4,000
14	72	WTP Fulford	Condition Assessment	Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure. Replace rear gutters.	4, 6	Immediate to < 1 year	\$10,000
15	82	PRS Sunnyside	Condition Assessment CRD Staff Comments	Replace impellers in pumps.	2, 4, 6	Immediate to < 1 year	\$6,000
16	83	PRS Sunnyside	Condition Assessment	No protective barrier for a ~2 ft drop to the east of the electrical cabinet. A 4 m metal rail should be installed.	2	Immediate to < 1 year	\$3,000
17	84	PRS Sunnyside	Condition Assessment	Recommend purchasing portable CFE tripod and winch to use at this station and others.	2, 4	Immediate to < 1 year	\$5,000
18	85	PRS Sunnyside	Condition Assessment	Tree trimming required around Hydro Incoming pole and BC Hydro meter	6	Immediate to < 1 year	\$2,000
19	86	PRS Sunnyside	Condition Assessment	Provide housekeeping and Preventative Maintenance routine plan	6	Immediate to < 1 year	\$2,500
20	95	PRS Sunnyside	Condition Assessment	Tree trimming is required to allow access to the PCS and to clear the electrical meter located on the adjacent power pole.	6	Immediate to < 1 year	\$2,000
21	104	PRS Sunnyside	Condition Assessment	Install a full height guardrail that still allows for access but prevents a fall hazard when working on the tank.	2	Immediate to < 1 year	Refer to Item No. 83
22	105	PRS Sunnyside	Condition Assessment	Provide securing for a portable tri-pod device.	2, 4	Immediate to < 1 year	Refer to Item No. 84
23	108	PST Sunnyside	Condition Assessment	Inspect Fire Extinguisher and replace if required.	2, 6	Immediate to < 1 year	\$200
24	109	PST Sunnyside	Condition Assessment	Adjacent bushes require trimming to prevent damage to the wall system and finishes. Maintenance required on surrounding vegetation, including branches around overhead telecommunications.	6	Immediate to < 1 year	\$2,000
25	118	PST Sunnyside	Condition Assessment	Removal of moss buildup is required to prevent damage to the roofing materials and supporting structure.	6	Immediate to < 1 year	\$2,500
26	120	PST Sunnyside	Condition Assessment	Installation of a fire extinguisher is required.	2	Immediate to < 1 year	\$500
27	121	Distribution Fulford	Condition Assessment	Trail should have vegetation maintenance for access.	6	Immediate to < 1 year	\$2,000
28	122	Distribution Fulford	Condition Assessment	All standpipes should have cap on outlet.	2, 4	Immediate to < 1 year	\$500
29	123	Distribution Fulford	Condition Assessment CRD Staff Comments	Strainer for water intake requires inspection. Underwater inspection on raw water intake should be done	2, 4, 6	Immediate to < 1 year	\$10,000
30	124	Distribution Fulford	Condition Assessment	Air valves should be replaced	4, 6	Immediate to < 1 year	\$9,000
31	127	Distribution Fulford	CRD Staff Comment	Water service to 341 Reynolds Rd directly from RAW supply main with no treatment. Suggest CRD do further investigation to determine if water is to be treated or not or if the homeowner has a private treatment system.	2, 3, 4, 6	Immediate to < 1 year	\$5,000
32	129	Distribution Fulford	Condition Assessment	Watermain to be replaced with new services (< 1 year). Cost based on \$650 /m	2, 3, 4, 6	Immediate to < 1 year	\$2,900,000
33	135	Distribution Fulford	Condition Assessment	All standpipes should have cap on outlet.	6	Immediate to < 1 year	\$500

CRD Salt Spring Island Electoral Area
FULFORD WATER SYSTEM RECOMMENDED CAPITAL PROJECTS

Item No.	Condition Assessment Table Item No.	Asset Name	Evaluation Source	Description of Recommended Capital Project	Relevant Governing Principles	Timeline	Estimated Costs (in 2019 dollars)
34	140	Distribution Fulford	Condition Assessment	Replace severely corroded equipment	2, 4, 6	Immediate to < 1 year	\$5,000
35	1	WTP Fulford	Condition Assessment CRD Staff Comments	Install security fencing around the facility	2, 5, 6	1 - 5 years	\$20,000
36	3	WTP Fulford	Condition Assessment CRD Staff Comments	Replace flow meter facility and provide a secured vault.	2, 4, 5	1 - 5 years	\$20,000
37	12	WTP Fulford	Condition Assessment	Replace panel board directory, or Install larger electrical service	2, 4, 6	1 - 5 years	\$12,000
38	14	WTP Fulford	Condition Assessment	Replace Siemens unit	2, 4, 6	1 - 5 years	\$5,000
39	20	WTP Fulford	Condition Assessment	Replace Panel Board Directory. Address safety concerns regarding resetting motor overloads	2, 4, 6	1 - 5 years	\$5,000
40	25	WTP Fulford	Condition Assessment	Eaton VFD, MVX model no longer supported . Investigate alternatives	2, 4, 6	1 - 5 years	\$5,000
41	27	WTP Fulford	Condition Assessment	Provide a secure vault for float and level transducer wiring	2, 4, 6	1 - 5 years	\$6,000
42	38	WTP Fulford	Condition Assessment CRD Staff Comments	Install perimeter fencing around WTP.	4, 5, 6	1 – 5 years	Refer to Item No. 1
43	42	WTP Fulford	Condition Assessment	Install door mutes and replace roller type alarm system.	2, 4, 6	1 – 5 years	\$3,000
44	47	WTP Fulford	Condition Assessment	There is a requirement for a washroom facility on site.	5	1 – 5 years	\$6,000
45	49	WTP Fulford	Condition Assessment	Install hot water tank to temper water provided for eye wash station.	5	1 – 5 years	\$3,000
46	54	WTP Fulford	Condition Assessment CRD Staff Comments	Install perimeter fencing around water reservoir.	2, 4, 5, 6	1 – 5 years	\$15,000
47	66	WTP Fulford	Condition Assessment	Positive drainage is required at the rear of the pipe entry shed. Consider tying rainwater downspout to the existing perimeter drainage for the main part of the building.	4, 6	1 – 5 years	\$5,000
48	67	WTP Fulford	Condition Assessment CRD Staff Comments	Install perimeter fencing around WTP.	2, 4, 5, 6	1 – 5 years	Refer to Item No. 1
49	68	WTP Fulford	Condition Assessment	Backfill is required at foundation slab	4, 6	1 – 5 years	\$1,000
50	70	WTP Fulford	Condition Assessment	Replace cement siding at electrical mast on facility.	4, 6	1 – 5 years	\$2,000
51	71	WTP Fulford	Condition Assessment	Install door mutes and replace roller type alarm system.	2, 6	1 – 5 years	\$5,000
52	78	WTP Fulford	Condition Assessment	Support for a lifting apparatus is required at ceiling level to lift the 80lb lid for the Saturator. Support for a confined space entry apparatus is required over the DAF treatment system to accommodate entry for cleaning and servicing.	2, 4	1 – 5 years	\$25,000
53	79	WTP Fulford	Condition Assessment	There is a requirement for a washroom facility on site. A mechanical exhaust system is required to extract blue green cyanotoxins produced by blue green algae in the summer months.	2, 4, 5	1 – 5 years	\$6,000
54	81	WTP Fulford	Condition Assessment	Install hot water tank to temper water provided for eye wash station.	2	1 – 5 years	\$3,000
55	90	PRS Sunnyside	Condition Assessment	Eaton VFD, MVX model no longer supported . Investigate alternatives	2, 4, 6	1 – 5 years	\$5,000
56	93	PRS Sunnyside	Condition Assessment	Replace T8 Lamps with LED Lighting.	2, 4, 6	1 – 5 years	\$300
57	107	PST Sunnyside	Condition Assessment	Install in-line strainers in front of PRV.	4, 5	1 – 5 years	\$5,000
58	107	PST Sunnyside	Condition Assessment	Replace piping	4, 6	1 – 5 years	\$7,000
59	113	PST Sunnyside	Condition Assessment	Perimeter fencing is required to secure the pump system.	2, 4, 5, 6	1 – 5 years	\$15,000
60	117	PST Sunnyside	Condition Assessment	Door requires painting and replacement of door sweep and weather stripping to prevent insects from entering the building. Prepare and paint all surfaces to the Master Painter Institute (MPI) Standards.	5, 6	1 – 5 years	\$1,000
61	119	PST Sunnyside	Condition Assessment	Interior requires painting to prevent damage to the plywood finishes in case of a leak in the pumping system. Prepare and paint all surfaces to the Master Painter Institute (MPI) Standards.	5, 6	1 – 5 years	\$3,000
62	126	Distribution Fulford	Condition Assessment CRD Staff Comments	Demolish and replace existing building with underground chamber,	4, 6	1 - 5 years	\$25,000
63	139	Distribution Fulford	Condition Assessment	Replace lighting, heating, and receptacles in building.	2, 4, 6	1 - 5 years	\$1,000
64	128	Distribution Fulford	Condition Assessment	Watermain to be replaced with new services (+ 6 years). Cost based on \$500 /m	2, 3, 4, 6	6 + years	\$61,500
65	145	Distribution Fulford	Condition Assessment	Demolish existing building	2, 4, 6	6 + years	Refer to Item No. 126
66	146	Distribution Fulford	Condition Assessment	Demolish existing building	2, 4, 6	6 + years	Refer to Item No. 126
67	147	Distribution Fulford	Condition Assessment	Demolish existing building	2, 4, 6	6 + years	Refer to Item No. 126
68	149	Distribution Fulford	Condition Assessment	Demolish existing building	2, 4, 6	6 + years	Refer to Item No. 126
69	150	Distribution Fulford	Condition Assessment	Demolish existing building	2, 4, 6	6 + years	Refer to Item No. 126

CRD Salt Spring Island Electoral Area
FULFORD WATER SYSTEM RECOMMENDED CAPITAL PROJECTS

Item No.	Condition Assessment Table Item No.	Asset Name	Evaluation Source	Description of Recommended Capital Project	Relevant Governing Principles	Timeline	Estimated Costs (in 2019 dollars)
70	1	WTP Fulford	Condition Assessment	There is a requirement for a washroom facility on site	2, 5	6 + years	\$6,000
71	18	WTP Fulford	Condition Assessment	Replace T8 Lamps with LED lighting	2, 4, 6	6 + years	\$3,000
72	29	WTP Fulford	Condition Assessment	Replace T8 Lamps with LED lighting	2, 4, 6	6 + years	\$1,000