



# **2020 Corporate Strategic Asset Management Plan**

## **Appendix E**

### **Condition Assessment Framework Part 6 - Sewer Systems**

## 800 - Cowichan Bay Sewer

Infrastructure Condition Assessment and Capital Plan  
1825 Cowichan Bay Road., Cowichan Bay, BC

Date Prepared

July 18, 2018

### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$17,692,159	
Number of Users	870	
Replacement Cost Per User	\$20,336	
Annual Replacement Cost (40 Years)	\$289,143	per year
Annual Replacement Cost (80 Years)	\$218,422	per year
10 Year Capital Plan Total	\$125,000	
10 Year Operations and Maintenance Pla	\$165,000	

### PROPERTY DESCRIPTION

The Cowichan Bay Sewer system started construction in 1972 and includes the phases outlined in the table below.

Development	Year Installed	Source
Collection System	1972	CBS-931401
Cowichan Bay Rd	2000	Record Drawings (237-01-01)
Lift Station (Cowinchan Bay)	2004	Record Drawings (12032400)
Glen Rd/Rondeault Rd/Simon Place	2004	Record Drawings (1431-01)
Simon Place	2004	Record Drawings (1448-01)
Forcemain	2005	Record Drawings (12032400)
Casalinda Place	2005	Record Drawings (010932-20)
Falcon Crescent	2006	Record Drawings (1004-C)
Cowichan Bay Rd	2006	Record Drawings (EV1153-1-03)
Buena Vista Place/Regatta Place	2010	Record Drawings (1600-01-01)
Cowichan Bay Rd	2011	Record Drawings (101-15938-00)
The Cannery	2015	Record Drawings (3093-002)
Vee rd/Mallard way	2015	Record Drawings (1053-C-01)

### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
Todd Etherington, Utility Operations Superintendent  
David Parker, Engineering Technologist III  
Rob Grant, GIS Supervisor  
Andrea Kross, GIS Technician I  
Adam Greenwood, Project Engineer  
Kieran Bertsch, E.I.T.  
Caleb Light, GIS

### CONTACT INFORMATION

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## 800 - Cowichan Bay Sewer

Infrastructure Condition Assessment and Capital Plan  
1825 Cowichan Bay Road., Cowichan Bay, BC

Date Prepared July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 2, 2018	Adam Greenwood and Kieran Bertsch	STEP Systems were identified in the GIS System. We have assumed that these systems are the responsibility of the homeowner and therefore the CVRD is not responsible for the replacement and servicing of these systems.
March 2, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 14, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 800 - Cowichan Bay Sewer

Infrastructure Condition Assessment and Capital Plan

1825 Cowichan Bay Road., Cowichan Bay, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	S-LS-COM-6	Capital Renewal	Locate VFDs and control panels in lift station housing to reduce condensation.	\$5,000	\$25,000
	8	3	S-LS-GEN-11	Capital Renewal	Install generator to code at Buena Vista PI lift station.	\$20,000	
	9						
Medium Term (5 - 10 Year)	10	2	S-LS-GEN-7	Capital Upgrade/New	Replace generator at lift station.	\$100,000	\$100,000
	11						
	12						
						Total	\$125,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-LS-BLD-1	Maintenance	Outfall of Lagoons may be upgraded by JUB. Confirm portion of cost to be contributed to outfall improvements and any other future lagoon upgrades/improvements.	\$10,000	\$105,000
	8	2	S-LS-BLD-2	Maintenance	Issues with I&I have resulted in LS backups and trucking sewage. Continue I&I investigation and repairs.	\$40,000	
	9	4, 20, 23, 30 and 42	ALL	Operations	Inspect/flush forcemain to confirm there are no operational issues.	\$40,000	
	10	48	S-STP-DF-103	Operations	Review condition of disposal field.	\$15,000	
	11						
	12						
Medium Term (5 - 10 Year)	13	17 to 48	ALL	Operations	Inspect/assess collection system and manholes for deterioration and I&I issues to determine replacement timing/phasing. This will include visual inspections, and/or reviewing historical maintenance and repair frequencies.	\$60,000	\$60,000
	14						
	15						
	16						
	17						
						Total	\$165,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



800 Cowichan Bay Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**LIFT STATION  
FIELD INSPECTION**

*Park Place .  
Cowichan Bay Sewer .*

**SYSTEM:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**SYSTEM CODE:** \_\_\_\_\_ **PROJECT No.:** 5170700

**INSPECTED BY:** \_\_\_\_\_ **CVRD STAFF PRESENT:** \_\_\_\_\_

1) Site Conditions

2) Building Conditions

3) Condition of wet well:  
Visible Deterioration of structure and hatch:

800 (1)



800 (2)  
1 of 9

800 Cowichan Bay Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



800 (3)



800 (4)  
2 of 9

800 Cowichan Bay Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



800 (5)



800 (6)  
3 of 9

800 Cowichan Bay Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



800 (7)



800 (8)  
4 of 9

800 Cowichan Bay Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



800 (9)



800 (10)  
5 of 9

800 Cowichan Bay Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



800 (11)



800 (12)

800 Cowichan Bay Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



800 (13)



800 (14)  
7 of 9

800 Cowichan Bay Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



800 (15)



800 (16)  
8 of 9

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800 (17)

## 801 - Brulette Place Sewer

### Infrastructure Condition Assessment and Capital Plan

Brulette Place, Mill Bay, BC

Date Prepared

July 18, 2018

#### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$2,853,530	
Number of Users	56	
Replacement Cost Per User	\$50,956	
Annual Replacement Cost (40 Years)	\$45,927	per year
Annual Replacement Cost (80 Years)	\$35,229	per year
10 Year Capital Plan Total	\$290,000	
10 Year Operations and Maintenance Plan Total	\$26,000	

#### PROPERTY DESCRIPTION

The Brulette Place Sewer system was originally constructed by a developer with multiple household scale treatment systems connected together for treatment. The CVRD has purchased a membrane treatment system (TORAY) and will be retrofitting the treatment system in the near future. The date of the original system install was not available at the time of this assessment.

Development	Year Installed	Source
Treatment System - Multiple household scale treatment systems	n/a (assumed 2000)	CVRD Input
Treatment System - RBC and RIB for 19 units	n/a (assumed 2000)	CVRD Input
Brulette Place Collection	2003	Record Drawing (151-01)

#### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
 Todd Etherington, Utility Operations Superintendent  
 David Parker, Engineering Technologist III  
 Rob Grant, GIS Supervisor  
 Andrea Kross, GIS Technician I  
 Adam Greenwood, Project Engineer  
 Kieran Bertsch, E.I.T.  
 Caleb Light, GIS

#### CONTACT INFORMATION

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## 801 - Brulette Place Sewer

### Infrastructure Condition Assessment and Capital Plan

Brulette Place, Mill Bay, BC

Date Prepared

July 18, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 2, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 801 - Brulette Place Sewer

Infrastructure Condition Assessment and Capital Plan  
Brulette Place, Mill Bay, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1	1	S-STP-STP-1	Capital Renewal	Install Toray System and modify existing system.	\$250,000	\$250,000
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-STP-GEN-5	Capital Renewal	Replace generator for STP (scheduled).	\$40,000	\$40,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
<b>Total</b>							<b>\$290,000</b>

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-STP-UV-6	Operations	Inspect/assess UV filter in STP to ensure it is performing well.	\$2,000	\$16,000
	8	2	S-STP-STP-8 and S-STP-PP-9	Operations	Review condition of RBC treatment system for deterioration to determine replacement timing/phasing.	\$5,000	
	9	3	S-STP-STP-10	Operations	Review condition of RIB treatment system for deterioration to determine replacement timing/phasing.	\$5,000	
	10	4	ALL	Operations	Inspect/assess lift station and pumps to ensure they are performing well.	\$2,000	
	11	5	ALL	Operations	Inspect/assess lift station and pumps to ensure they are performing well.	\$2,000	
	12						
Medium Term (5 - 10 Year)	13	1	S-STP-PP-2	Operations	Inspect/assess process piping in STP for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$5,000	\$10,000
	14	1	S-STP-COM-4	Operations	Assess communication system to ensure it meets the system needs.	\$5,000	
	15						
	16						
	17						
<b>Total</b>							<b>\$26,000</b>

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**SEWAGE TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Brulette Place Sewer DATE: Nov 23/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 801 PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic)  
1 - 19 homes → registration not needed class ↑  
1 - 30 homes  
↳

2) Site Conditions/Security

3) Condition of Structure:

801 (1)



801 (2)  
1 of 14

801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (3)



801 (4)  
2 of 14

801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (5)



801 (6)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (7)



801 (8)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (9)



801 (10)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (11)



801 (12)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (13)



801 (14)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (15)



801 (16)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (17)



801 (18)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (19)



801 (20)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (21)



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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (25)



801 (26)  
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801 Brulette Place Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



801 (28)

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Brulette Place Sewer - Com. Kiosk - Functional Code 801

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to Complete Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars	
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the structure was not reported and has been assumed.	5	5	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	120	\$20	SF	\$2,400	0%	5%	5%	\$3,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	120	\$10	SF	\$1,200	0%	5%	5%	\$2,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2010	21-Nov-17	MH	8	50	42	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	120	\$40	SF	\$4,800	0%	5%	5%	\$6,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2010	21-Nov-17	MH	8	12	4	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	200	\$8	SF	\$1,600	0%	15%	5%	\$2,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2010	21-Nov-17	MH	8	50	42	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	200	\$35	SF	\$7,000	0%	5%	5%	\$8,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit		1	Perforated metal soffit is present at the roof overhangs.	5	5	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$20	SF	\$1,200	0%	10%	5%	\$2,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	Two painted metal doors are present on the building.	5	5	2010	21-Nov-17	MH	8	30	22	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped roof assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders which drain to grade.	5	5	2010	21-Nov-17	MH	8	25	17	Replace the roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	150	\$30	SF	\$4,500	0%	5%	5%	\$5,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped roof assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders which drain to grade.	5	5	2010	21-Nov-17	MH	8	25	17	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	40	\$10	SF	\$400	0%	10%	5%	\$1,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes			The interior gypsum and plywood walls and ceilings are painted.	5	5	2010	21-Nov-17	MH	8	20	12	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Brulette Place Sewer - Com. Kiosk	Sewer Service Building	801	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	13	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Bruletter Place Sewer - Com. Kiosk - Functional Code 801



Photo 1

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Brulette Place Sewer - Lift Station - Functional Code 801**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr. Next or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Brulette Place Sewer - Lift Station	Sewer Service Building	801	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the structure was not reported and has been assumed.	5	5	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$20	SF	\$1,000	0%	5%	5%	\$2,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$10	SF	\$500	0%	5%	5%	\$1,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2010	21-Nov-17	MH	8	50	42	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$40	SF	\$2,000	0%	5%	5%	\$3,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Metal Siding	1	Painted metal siding (with exposed fasteners) is present on the exterior walls.	4	4	2010	21-Nov-17	MH	8	12	4	Complete fastener and sealant replacement as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	15%	5%	\$1,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted metal siding (with exposed fasteners) is present on the exterior walls.	5	5	2010	21-Nov-17	MH	8	50	42	The metal siding is expected to last the life of the building.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$35	SF	\$6,300	0%	5%	5%	\$7,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	16	\$20	SF	\$320	0%	10%	5%	\$1,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	5	5	2010	21-Nov-17	MH	8	30	22	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof.  The roof is edge drained.	5	5	2010	21-Nov-17	MH	8	40	32	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations. It is assumed that this work would be completed with the siding remedial work.	Replacement	3 - Future Renewal	No	Yes	No	No	60	\$30	SF	\$1,800	0%	5%	5%	\$2,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior plywood walls are not painted, the gypsum sheathing is painted.	5	5	2010	21-Nov-17	MH	8	20	12	Repaint interiors as required. Cost assumed that walls will be painted.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Brulette Place Sewer - Lift Station	Sewer Service Building	801	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Brulette Place Sewer - Lift Station - Functional Code 801

BUD Name	BUD Type	Function Code	Level 1 Major Group Element	Level 2 Group Element	Level 3 Individual Element	COMPONENT			CONDITION ASSESSMENT						LIFECYCLE DATA				RECOMMENDATION			OPINION OF PROBABLE COST										10-YEAR CAPITAL PLAN													
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age to 2018	Typical Life Cycle or Action Interval	E.L. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027			
																																	\$0	\$0	\$0	\$1,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Brulette Place Sewer - Lift Station	Sewer Service Building	801	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations. The age of the structure was not reported and has been assumed.	5	5	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$20	SF	\$1,000	0%	5%	5%	\$2,000													
Brulette Place Sewer - Lift Station	Sewer Service Building	801	A Substructure	A10 Foundations	A1010 Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$10	SF	\$500	0%	5%	5%	\$1,000													
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2010	21-Nov-17	MH	8	50	42	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$40	SF	\$2,000	0%	5%	5%	\$3,000													
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Metal Siding	1	Painted metal siding (with exposed fasteners) is present on the exterior walls.	4	4	2010	21-Nov-17	MH	8	12	4	Complete fastener and sealant replacement as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	15%	5%	\$1,000				\$1,000									
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted metal siding (with exposed fasteners) is present on the exterior walls.	5	5	2010	21-Nov-17	MH	8	50	42	The metal siding is expected to last the life of the building.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$35	SF	\$6,300	0%	5%	5%	\$7,000													
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	16	\$20	SF	\$320	0%	10%	5%	\$1,000													
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	B20 Enclosure	B203001 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	5	5	2010	21-Nov-17	MH	8	30	22	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000													
Brulette Place Sewer - Lift Station	Sewer Service Building	801	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. The roof is edge drained.	5	5	2010	21-Nov-17	MH	8	40	32	Replace the metal roof at the end of its service life. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations. It is assumed that this work would be completed with the siding remedial work.	Replacement	3 - Future Renewal	No	Yes	No	No	60	\$30	SF	\$1,800	0%	5%	5%	\$2,000													
Brulette Place Sewer - Lift Station	Sewer Service Building	801	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301001 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior plywood walls are not painted, the gypsum sheathing is painted.	5	5	2010	21-Nov-17	MH	8	20	12	Repaint interiors as required. Cost assumed that walls will be painted. Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000													
Brulette Place Sewer - Lift Station	Sewer Service Building	801	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000													

Cowichan Valley Regional District

Bruletter Place Sewer - Lift Station- Functional Code 801



Photo 1



Photo 2

## 802 - Sentinel Ridge Sewer

### Infrastructure Condition Assessment and Capital Plan

2372 Coopers Hawk Rise, Mill Bay, BC

Date Prepared

July 18, 2018

#### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$7,970,841	
Number of Users	95	
Replacement Cost Per User	\$83,904	
Annual Replacement Cost (40 Years)	\$93,659	per year
Annual Replacement Cost (80 Years)	\$98,405	per year
10 Year Capital Plan Total	\$230,000	
10 Year Operations and Maintenance Plan Total	\$80,000	

#### PROPERTY DESCRIPTION

The Sentinel Ridge Sewer system is a new system that was originally constructed in 2006 and includes the phases listed in the table below.

Development	Year Installed	Source
Treatment System	2006	CVRD Input
Collection System	2006	CVRD Input
Sentinel Drive, Dagall Rd, Rozon Rd, Coopers Hawk Rise, Bay Bluff Pl	2006	Record Drawing (22375_01_D1_Rev_H)
Hidden Creek Lift Station	2006	CVRD Input
Sentinel Dr, Tercel Court	2010	Record Drawing (22375.01))
Mill Bay Marina Lift Station	2012	Record Drawing (101-15273-01)
Handy Road and Mill May Marina	2012	Record Drawing (101-15273-01)
Mill Bay Place and Sangster Road	2013	Record Drawing (23019_01)
Treatment System Upgrade	2013	Record Drawing (12-089)
Noowick Road	2015	Record Drawing (28367_01_D1)

#### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
 Todd Etherington, Utility Operations Superintendent  
 David Parker, Engineering Technologist III  
 Rob Grant, GIS Supervisor  
 Andrea Kross, GIS Technician I  
 Adam Greenwood, Project Engineer  
 Kieran Bertsch, E.I.T.  
 Caleb Light, GIS

#### CONTACT INFORMATION

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# 802 - Sentinel Ridge Sewer

Infrastructure Condition Assessment and Capital Plan

2372 Coopers Hawk Rise, Mill Bay, BC

Date Prepared

July 18, 2018

**REPORT NOTES**

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 2, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 802 - Sentinel Ridge Sewer

Infrastructure Condition Assessment and Capital Plan

2372 Coopers Hawk Rise, Mill Bay, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-STP-BLW-19	Capital Upgrade/New	Install new blowers in STP to double capacity when system is expanded (scheduled).	\$200,000	\$200,000
	8						
	9						
Medium Term (5 - 10 Year)	10	1	S-STP-STP-2	Capital Upgrade/New	Add Purafil unit to STP for odour control (scheduled).	\$30,000	\$30,000
	11						
	12						
						Total	\$230,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	As Noted	Operations	Inspect/assess STP and treatment process for deterioration to determine replacement timing/phasing.	\$15,000	\$35,000
	8	2	ALL	Operations	Inspect/assess Mill Bay marina lift station for deterioration to determine replacement timing/phasing.	\$10,000	
	9	3	ALL	Operations	Inspect/assess Hidden Creek lift station for deterioration to determine replacement timing/phasing.	\$10,000	
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	2	S-LS-WW-40	Operations	Continue to work with Marina to limit FOG (fats, oils and grease) entering Mill Bay marina lift station.	\$5,000	\$45,000
	14	4 to 7, 9, 10, 13 to 27	As Noted	Operations	Assess/Inspection forcemain for deterioration to determine replacement timing/phasing.	\$30,000	
	15	28	S-STP-DF-108	Operations	Assess/Inspection disposal field for deterioration to determine replacement timing/phasing.	\$10,000	
	16						
	17						
						Total	\$80,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



9	802	2372 Coopers Hawk Rise	Mill Bay rd 1+040 - 2+340	101-15273-02	S	FM	PP	61	S-FM-PP-61	Force main pipe, 75mm	DR11	HDPE	1300	m	2013	80	75	\$425	\$552,500				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
10	802	2372 Coopers Hawk Rise	Noowick rd 2+950 - 3+070	101-15273-02	S	FM	PP	62	S-FM-PP-62	Force main pipe, 75mm	DR11	HDPE	120	m	2013	80	75	\$425	\$51,000				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
10	802	2372 Coopers Hawk Rise	Noowick rd. 1+090- 1+213	28367 01 D1	S	FM	PP	63	S-FM-PP-63	Force main, 50mm		HDPE	133	m	2015	80	77	\$400	\$53,200				1	2	5	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	10+ Year
10	802	2372 Coopers Hawk Rise	Noowick rd. 1+090	28367 01 D1	S	FM	CO	64	S-FM-CO-64	Force main cleanout c/w chamber, valves, process piping			1	ea	2015	40	37	\$2,000	\$2,000				1	2	5				10+ Year
11	802	2372 Coopers Hawk Rise	Rozon rd. 1+000-1+090	28367 01 D1	S	FM	PP	65	S-FM-PP-65	Force main, 50mm		HDPE	90	m	2015	80	77	\$400	\$36,000				1	2	5				10+ Year
12	802	2372 Coopers Hawk Rise	Sangster rd. 0+005	23019 01 A2	S	SS	MH	66	S-SS-MH-66	Cap, 100mm, 2m depth			1	ea	2013	60	55	\$3,000	\$3,000				1	2	5				10+ Year
12	802	2372 Coopers Hawk Rise	Sangster rd. 0+020	23019 01 A2	S	SS	MH	67	S-SS-MH-67	Sewer manhole, SMH A-C, Ex. SMH A, 1.2-2.5m depths			4	ea	2013	40	35	\$8,000	\$32,000				1	2	5				10+ Year
12	802	2372 Coopers Hawk Rise	Sangster rd. Cap. SMH A	23019 01 A2	S	SS	S	68	S-SS-S-68	Sewer main, 100mm		PVC	13	m	2013	80	75	\$450	\$5,940				1	2	5				10+ Year
12	802	2372 Coopers Hawk Rise	Sangster rd. SMH A-Ex. SMH A, B, C-Stub	23019 01 A2	S	SS	S	69	S-SS-S-69	Sewer main, 200mm		PVC	330	m	2013	80	75	\$550	\$181,500				1	2	5				10+ Year
12	802	2372 Coopers Hawk Rise	Sangster rd.	23019 01 A2	S	SS	SV	70	S-SS-SV-70	Service connections			4	ea	2013	60	55	\$3,000	\$12,000				1	2	5				10+ Year
13	802	2372 Coopers Hawk Rise	Sentinel dr. SMH A SMH F	22375 01 A1	S	FM	PP	71	S-FM-PP-71	Force main pipe, 100mm		PVC	324	m	2010	80	72	\$450	\$145,688				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
13	802	2372 Coopers Hawk Rise	Sentinel dr.	22375 01 A1	S	SS	MH	72	S-SS-MH-72	Sewer manhole, SMH A-F, 1.2-2.7m depths			6	ea	2010	40	32	\$8,000	\$48,000				1	1	5				10+ Year
13	802	2372 Coopers Hawk Rise	Sentinel dr. SMH A, B, C, D, E, F	22375 01 A1	S	SS	S	73	S-SS-S-73	Sewer main, 200mm		PVC	324	m	2010	80	72	\$550	\$178,063				1	1	5				10+ Year
13	802	2372 Coopers Hawk Rise	Sentinel dr.	22375 01 A1	S	SS	SV	74	S-SS-SV-74	Service connections			21	ea	2010	60	52	\$3,000	\$63,000				1	1	5				10+ Year
14	802	2372 Coopers Hawk Rise	Terrel court, 6+005 - 6+115	22375 01 A2	S	FM	PP	75	S-FM-PP-75	Force main pipe, 50mm	SCHD 40	PVC	110	m	2010	80	72	\$400	\$44,000				1	1	5				10+ Year
14	802	2372 Coopers Hawk Rise	Terrel court	22375 01 A1	S	SS	SV	76	S-SS-SV-76	Service connections			8	ea	2010	60	52	\$3,000	\$24,000				1	1	5				10+ Year
15	802	2372 Coopers Hawk Rise	BAY BLUFF PLACE	GIS	S	FM	PP	77	S-FM-PP-77	Force main, 50mm			59	m	2006	80	68	\$400	\$23,595				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
16	802	2372 Coopers Hawk Rise	BICKFORD WAY	GIS	S	FM	PP	78	S-FM-PP-78	Force main, 100mm			392	m	2006	80	68	\$450	\$176,494				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
16	802	2372 Coopers Hawk Rise	BICKFORD WAY	GIS	S	SS	S	79	S-SS-S-79	Sewer main, 150mm			217	m	2006	80	68	\$500	\$108,399				1	2	5				10+ Year
16	802	2372 Coopers Hawk Rise	BICKFORD WAY	GIS	S	SS	S	80	S-SS-S-80	Sewer main, 200mm			225	m	2006	80	68	\$550	\$123,712				1	2	5				10+ Year
17	802	2372 Coopers Hawk Rise	BICKFORD WAY	GIS	S	FM	PP	81	S-FM-PP-81	Force main, unknown diameter, assumed 100mm			2	m	2006	80	68	\$450	\$1,048				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
18	802	2372 Coopers Hawk Rise	COOPERS HAWK RISE	GIS	S	FM	PP	82	S-FM-PP-82	Force main, 50mm			91	m	2006	80	68	\$400	\$36,569				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
18	802	2372 Coopers Hawk Rise	COOPERS HAWK RISE	GIS	S	FM	PP	83	S-FM-PP-83	Force main, 62mm (GIS minus catalogued length of 75mm force main from 101-15273-02)			156	m	2006	80	68	\$400	\$62,515				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
18	802	2372 Coopers Hawk Rise	COOPERS HAWK RISE	GIS	S	FM	PP	84	S-FM-PP-84	Force main, 100mm (includes 5m unknown diameter)			265	m	2006	80	68	\$450	\$119,222				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
19	802	2372 Coopers Hawk Rise	HANDY ROAD	GIS	S	SS	S	85	S-SS-S-85	Sewer main, 150mm (GIS minus catalogued length from 101-15273-01)			19	m	2006	80	68	\$500	\$9,269				1	2	5				10+ Year
19	802	2372 Coopers Hawk Rise	HANDY ROAD	GIS	S	SS	S	86	S-SS-S-86	Sewer main, 200mm (GIS minus catalogued length from 101-15273-01)			0	m	2006	80	68	\$550	\$17				1	2	5				10+ Year
20	802	2372 Coopers Hawk Rise	HUCKLEBERRY ROAD	GIS	S	FM	PP	87	S-FM-PP-87	Force main, 75mm (GIS minus catalogued length from 101-15273-02)			100	m	2006	80	68	\$425	\$42,692				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
21	802	2372 Coopers Hawk Rise	MILL BAY PLACE	GIS	S	FM	PP	88	S-FM-PP-88	Force main, 50mm (GIS minus catalogued length from 23019 01 A2)			17	m	2006	80	68	\$400	\$6,843				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
21	802	2372 Coopers Hawk Rise	MILL BAY PLACE	GIS	S	SS	S	89	S-SS-S-89	Sewer main, 200mm			88	m	2006	80	68	\$550	\$48,395				1	2	5				10+ Year
22	802	2372 Coopers Hawk Rise	MILL BAY ROAD	GIS	S	FM	PP	90	S-FM-PP-90	Force main, 75mm (GIS minus catalogued length from 101-15273-02)			223	m	2006	80	68	\$425	\$94,669				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
23	802	2372 Coopers Hawk Rise	NOOWICK ROAD	GIS	S	SS	S	91	S-SS-S-91	Sewer main, 50mm (GIS minus catalogued length from 28367 01 D1)			0	m	2006	80	68	\$400	\$0				1	2	5				10+ Year
23	802	2372 Coopers Hawk Rise	NOOWICK ROAD	GIS	S	FM	PP	92	S-FM-PP-92	Force main, 75mm (includes 44m of unknown diameter) (GIS minus catalogued length from 101-15273-02)			103	m	2006	80	68	\$425	\$43,960				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
24	802	2372 Coopers Hawk Rise	ROZON ROAD	GIS	S	FM	PP	93	S-FM-PP-93	Force main, 50mm (GIS minus catalogued length from 28367 01 D1)			13	m	2006	80	68	\$400	\$5,255				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
24	802	2372 Coopers Hawk Rise	ROZON ROAD	GIS	S	FM	PP	94	S-FM-PP-94	Force main, 62mm			174	m	2006	80	68	\$400	\$69,492				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
24	802	2372 Coopers Hawk Rise	ROZON ROAD	GIS	S	FM	PP	95	S-FM-PP-95	Force main, 100mm			189	m	2006	80	68	\$450	\$85,064				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
24	802	2372 Coopers Hawk Rise	ROZON ROAD	GIS	S	SS	S	96	S-SS-S-96	Sewer main, 50mm			94	m	2006	80	68	\$400	\$37,674				1	2	5				10+ Year
24	802	2372 Coopers Hawk Rise	ROZON ROAD	GIS	S	SS	S	97	S-SS-S-97	Sewer main, 200mm (includes 23m unknown diameter)			404	m	2006	80	68	\$550	\$222,254				1	2	5				10+ Year
25	802	2372 Coopers Hawk Rise	SANGSTER ROAD	GIS	S	SS	S	98	S-SS-S-98	Sewer main, 200mm (GIS minus catalogued length from 23019 01 A2)			0	m	2006	80	68	\$550	\$0				1	2	5				10+ Year
26	802	2372 Coopers Hawk Rise	SENTINEL DRIVE	GIS	S	FM	PP	99	S-FM-PP-99	Force main, 62mm			76	m	2006	80	68	\$400	\$30,255				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
26	802	2372 Coopers Hawk Rise	SENTINEL DRIVE	GIS	S	FM	PP	100	S-FM-PP-100	Force main, 75mm			339	m	2006	80	68	\$425	\$143,874				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
26	802	2372 Coopers Hawk Rise	SENTINEL DRIVE	GIS	S	FM	PP	101	S-FM-PP-101	Force main, 100mm (GIS minus catalogued length from 22375 01 A1)			395	m	2006	80	68	\$450	\$177,747				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
26	802	2372 Coopers Hawk Rise	SENTINEL DRIVE	GIS	S	SS	S	102	S-SS-S-102	Sewer main, 200mm (GIS minus catalogued length from 22375 01 A1)			110	m	2006	80	68	\$550	\$60,573				1	2	5				10+ Year
27	802	2372 Coopers Hawk Rise	TERCEL COURT	GIS	S	FM	PP	103	S-FM-PP-103	Force main, 50mm (GIS minus catalogued length from 22375 01 A2)			7	m	2006	80	68	\$400	\$2,643				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
27	802	2372 Coopers Hawk Rise	TERCEL COURT	GIS	S	FM	PP	104	S-FM-PP-104	Force main, 100mm (includes 49m unknown material)			177	m	2006	80	68	\$450	\$79,445				1	3	4	Assess/inspect force main for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year
28	802	2372 Coopers Hawk Rise	Entire system	GIS	S	SS	SV	105	S-SS-SV-105	Sewer Service Connections, (GIS minus catalogued number from record drawings)			114	ea	2006	60	48	\$3,000	\$342,000				1	2	5				10+ Year
28	802	2372 Coopers Hawk Rise	Entire system	GIS	S	SS	MH	106	S-SS-MH-106	Sewer manholes, (minus catalogued number from record drawings)			13	ea	2006	40	28	\$8,000	\$104,000				1	2	5				10+ Year
28	802	2372 Coopers Hawk Rise	Entire system	GIS	S	SS	CO	107																					

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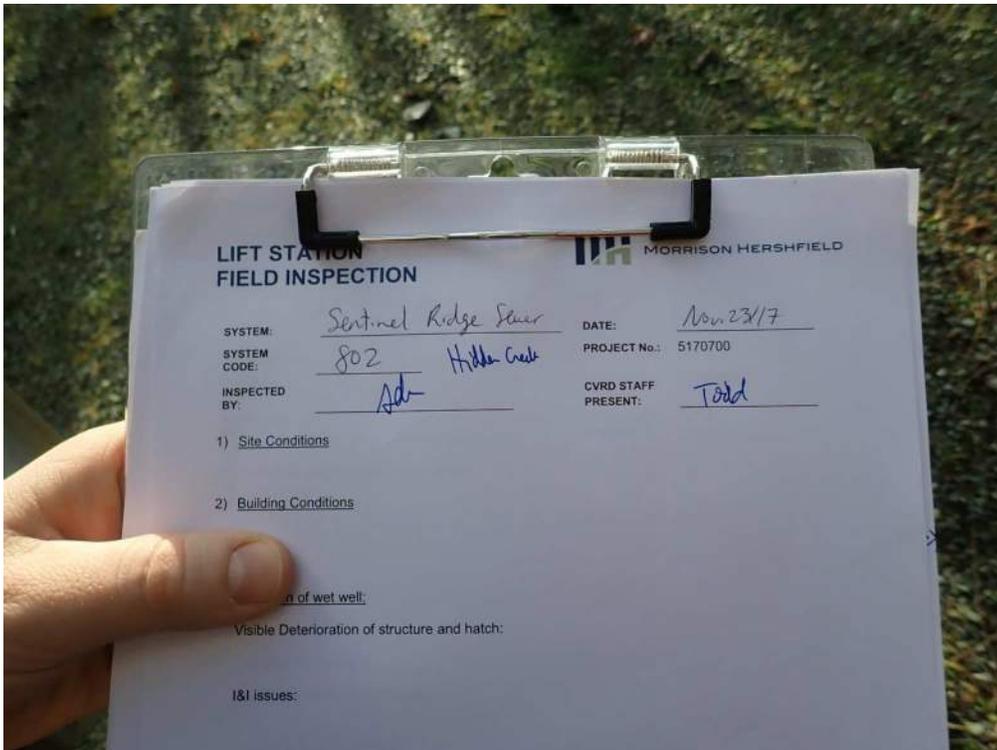


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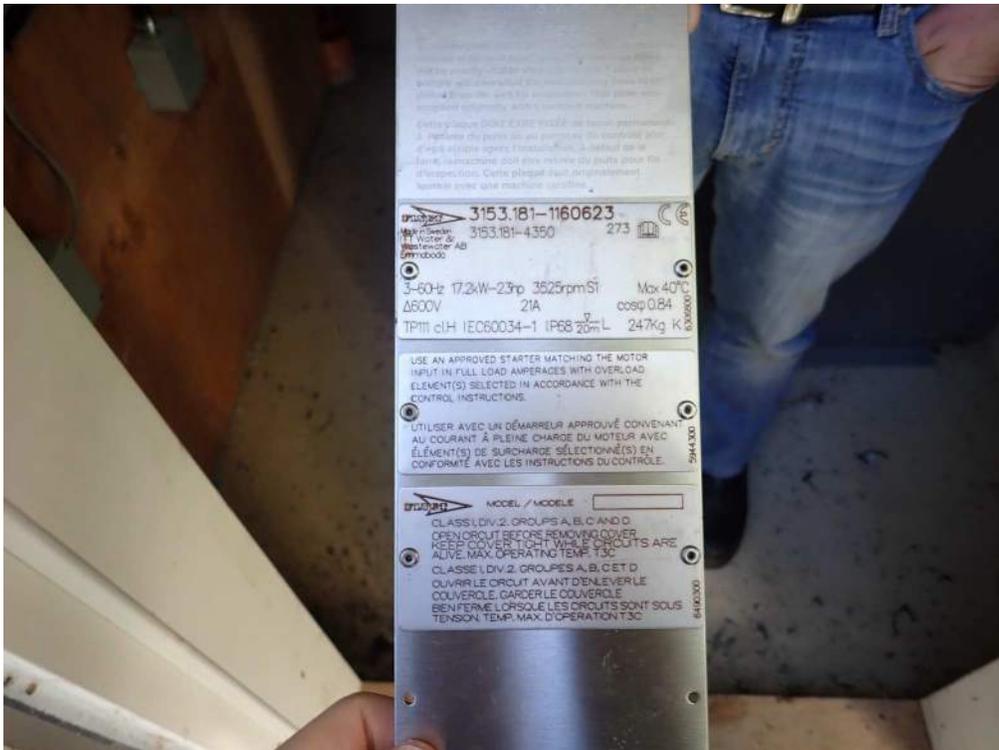


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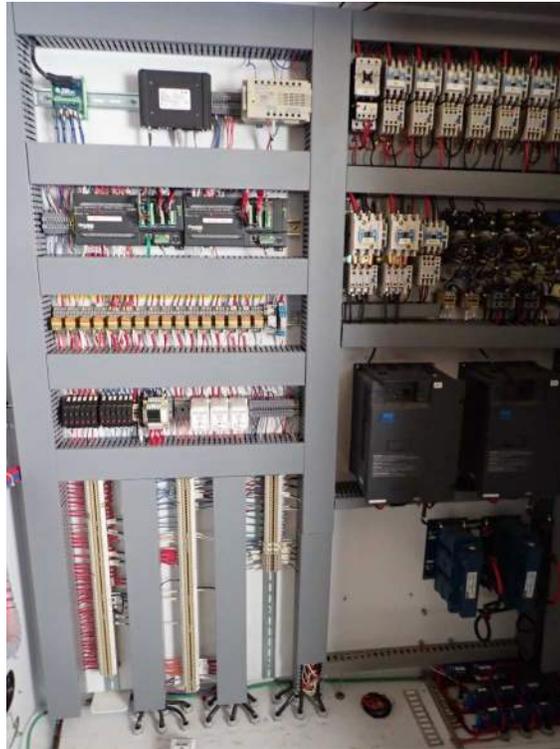


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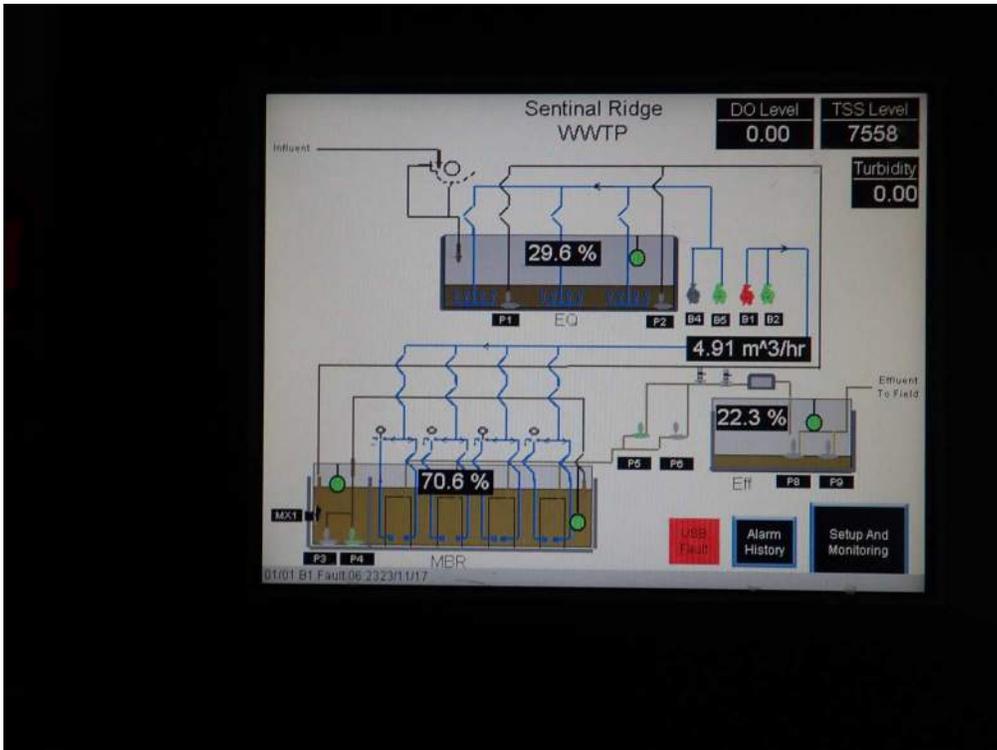


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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Sentinel Ridge Sewer - Lift Station 1 - Functional Code 802**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	Description & History	CONDITION ASSESSMENT			LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	OPINION OF PROBABLE COST									
						ID	Location / Type			Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EO or Major Action	Recommendation					Type	Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult	Contingency	5% Tax	Total in 2017 Dollars
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2012	21-Nov-17	MH	6	50	44	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$20	SF	\$1,000	0%	5%	5%	\$2,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2012	21-Nov-17	MH	6	50	44	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$10	SF	\$500	0%	5%	5%	\$1,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2012	21-Nov-17	MH	6	50	44	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$40	SF	\$2,000	0%	5%	5%	\$3,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		The cladding consists of stained wood siding.	4	4	2012	21-Nov-17	MH	6	12	6	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	200	\$8	SF	\$1,600	0%	15%	5%	\$2,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		The cladding consists of stained wood siding.	5	5	2012	21-Nov-17	MH	6	50	44	If maintained the wood siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	200	\$35	SF	\$7,000	0%	5%	5%	\$8,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit		Perforated metal soffit is present at the roof overhangs.	5	5	2012	21-Nov-17	MH	6	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	24	\$20	SF	\$480	0%	10%	5%	\$1,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		One painted metal door is present on the building.	5	5	2012	21-Nov-17	MH	6	30	24	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	B Shell	D30 Roofing	B3010 Roof Coverings	B301002 Low Sloped Roof Coverings	Roof/2-Ply SBS membrane		The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2012	21-Nov-17	MH	6	25	19	Replace the roofing membrane and perimeter flashings at the end of their service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	50	\$30	SF	\$1,500	0%	5%	5%	\$2,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		The interior plywood walls are not painted, the gypsum sheathing is painted.	5	5	2012	21-Nov-17	MH	6	20	14	Repaint interiors as required. Cost assumed that walls will be painted.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Sentinel Ridge Sewer - Lift Station 1	Sewer Building	802	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2012	21-Nov-17	MH	6	20	13	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Sentinel Ridge Sewer - Lift Station (1)- Functional Code 802



Photo 1



Photo 2

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Sentinel Ridge Sewer - Lift Station 2 - Functional Code 802**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST													
						ID	Location / Type		Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars		
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	70	\$20	SF	\$1,400	0%	5%	5%	\$2,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	70	\$10	SF	\$700	0%	5%	5%	\$1,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2010	21-Nov-17	MH	8	50	42	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	70	\$40	SF	\$2,800	0%	5%	5%	\$4,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2010	21-Nov-17	MH	8	12	5	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	200	\$8	SF	\$1,600	0%	15%	5%	\$2,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2010	21-Nov-17	MH	8	50	42	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	200	\$35	SF	\$7,000	0%	5%	5%	\$8,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit		1	Perforated metal soffit is present at the roof overhangs.	5	5	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	Two painted metal doors are present on the building.	5	5	2010	21-Nov-17	MH	8	30	22	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped assembly which has been waterproofed with asphalt shingles.	5	5	2010	21-Nov-17	MH	8	25	17	Replace the asphalt shingle assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	80	\$30	SF	\$2,400	0%	5%	5%	\$3,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2010	21-Nov-17	MH	8	20	12	Repaint interiors as required.  Note: a long service life has been included to reflect building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Sentinel Ridge Sewer - Lift Station 2	Sewer Building	802	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	Exterior Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	13	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Sentinel Ridge Sewer - Lift Station (2)- Functional Code 802



Photo 1



Photo 2

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Sentinel Ridge Sewer - Sewer Treatment Plant - Functional Code 802

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr. Since Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOQ or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2013	21-Nov-17	MH	5	50	45	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	800	\$30	SF	\$24,000	0%	5%	5%	\$27,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2013	21-Nov-17	MH	5	50	45	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	800	\$30	SF	\$24,000	0%	5%	5%	\$27,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2013	21-Nov-17	MH	5	10	5	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2013	21-Nov-17	MH	5	50	45	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2013	21-Nov-17	MH	5	50	45	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	800	\$30	SF	\$24,000	0%	5%	5%	\$27,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2013	21-Nov-17	MH	5	12	7	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	800	\$8	SF	\$6,400	0%	15%	5%	\$8,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2013	21-Nov-17	MH	5	50	45	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	800	\$35	SF	\$28,000	0%	5%	5%	\$31,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2013	21-Nov-17	MH	5	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$20	SF	\$2,000	0%	10%	5%	\$3,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	C820 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Windows	1	Two vinyl framed windows are present on the building.	5	5	2013	21-Nov-17	MH	5	25	20	Replace windows at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$200	EA	\$400	0%	10%	5%	\$1,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	5	5	2013	21-Nov-17	MH	5	30	25	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	B20 Enclosure	E2030 Exterior Doors	B203004 Overhead and Roll-up Doors	Exterior Walls/ Door	1	One metal overhead door is present.	5	5	2013	21-Nov-17	MH	5	20	15	Replace doors at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2013	21-Nov-17	MH	5	25	20	Replace the roof assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	850	\$30	SF	\$25,500	0%	5%	5%	\$28,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2013	21-Nov-17	MH	5	25	20	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2013	21-Nov-17	MH	5	20	15	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	0%	5%	\$2,000
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2013	21-Nov-17	MH	5	20	15	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Sentinel Ridge Sewer - Sewer Treatment Plant - Functional Code 802

BUD Num	BUD Type	Function Code	Level 1 Major Group Element	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST								10-YEAR CAPITAL PLAN																	
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age to 2018	Typical Life Cycle or Action Interval	E.L. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027				
																																	\$0	\$0	\$0	\$0	\$1,000	\$0	\$8,000	\$0	\$0	\$0				
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2013	21-Nov-17	MH	5	50	45	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	800	\$30	SF	\$24,000	0%	5%	5%	\$27,000													
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Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2013	21-Nov-17	MH	5	25	20	Replace the roof assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	850	\$30	SF	\$25,500	0%	5%	5%	\$29,000													
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2013	21-Nov-17	MH	5	25	20	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000													
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2013	21-Nov-17	MH	5	20	15	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	0%	5%	\$2,000													
Sentinel Ridge Sewer - Sewer Treatment Plant	Sewer Building	802	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	5	5	2013	21-Nov-17	MH	5	20	15	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000													

Cowichan Valley Regional District

Sentinel Ridge Sewer - Sewer Treatment Building (2)- Functional Code 802



Photo 1



Photo 2

## 803 - Twin Cedars Sewer

Infrastructure Condition Assessment and Capital Plan  
1413 Hutchinson Rd, Cobble Hill, BC

Date Prepared

July 18, 2018

### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$6,285,197	
Number of Users	74	
Replacement Cost Per User	\$84,935	
Annual Replacement Cost (40 Years)	\$65,866	per year
Annual Replacement Cost (80 Years)	\$77,595	per year
10 Year Capital Plan Total	\$150,000	
10 Year Operations and Maintenance Plan Total	\$120,000	

### PROPERTY DESCRIPTION

The system was originally constructed in 2008 and includes the phases outlined in the table below.

Development	Year Installed	Source
Sewage Treatment Plant	2008	CVRD Input
Hutchinson Road Lift Station and Twin Cedars	2008	Record Drawing (011497-20)
Rapid Infiltration Basin	2011	CVRD Input
Fisher Road, Heigh Road and Watson Road	2013	Record Drawing (2240-2)
Pine St, Princess Ave, Fairfield Rd, Garland Ave	2013	Record Drawing (2240-3)
Fairfield Rd, Holland Ave and Garland Ave	2013	Record Drawing (2240-4)

### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
 Todd Etherington, Utility Operations Superintendent  
 David Parker, Engineering Technologist III  
 Rob Grant, GIS Supervisor  
 Andrea Kross, GIS Technician I  
 Adam Greenwood, Project Engineer  
 Kieran Bertsch, E.I.T.  
 Caleb Light, GIS

### CONTACT INFORMATION

[atokarek@cvrd.bc.ca](mailto:atokarek@cvrd.bc.ca)  
[tetherington@cvrd.bc.ca](mailto:tetherington@cvrd.bc.ca)  
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[rgrant@cvrd.bc.ca](mailto:rgrant@cvrd.bc.ca)  
[akross@cvrd.bc.ca](mailto:akross@cvrd.bc.ca)  
[agreenwood@morrisonhershfield.com](mailto:agreenwood@morrisonhershfield.com)  
[kbertsch@morrisonhershfield.com](mailto:kbertsch@morrisonhershfield.com)  
[clight@morrisonhershfield.com](mailto:clight@morrisonhershfield.com)

## 803 - Twin Cedars Sewer

Infrastructure Condition Assessment and Capital Plan  
1413 Hutchinson Rd, Cobble Hill, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 2, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 3, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 803 - Twin Cedars Sewer

Infrastructure Condition Assessment and Capital Plan

1413 Hutchinson Rd, Cobble Hill, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	S-STP-BLW-22	Capital Upgrade/New	Upgrade to more efficient and quieter blowers in STP.	\$150,000	\$150,000
	11						
	12						
						Total	\$150,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	3	Operations	Operations	Inspect/assess lift station for deterioration to determine replacement timing/phasing.	\$10,000	\$10,000
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	1	ALL	Operations	Inspect/assess equalization and anoxic tanks, digester and membranes, UV reactors, process piping, pumps, chlorine system at STP for deterioration to determine any rehabilitation/replacement requirements. Review options to address odour complaints at STP and to improve controls of STP to improve system efficiency. Review implications on STP of expanding service area to include Cobble Hill.	\$70,000	\$110,000
	14	2	S-STP-DF-27	Operations	Inspect/assess Rapid Infiltration system for deterioration to determine any rehabilitation/replacement requirements.	\$5,000	
	15	4 to 13 and 25	ALL	Operations	Assess/Inspect forcemains and air release valve chambers for deterioration to determine replacement timing/phasing.	\$35,000	
	16						
	17						
						Total	\$120,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	Twin Cedars Sewer
City Address:	1413 Hutchison rd
Geographic Location:	East of Cobble Hill village
Customers:	76
Users:	74

Infrastructure Condition Assessment

Potential Service Con 132

Current Year	2018	Total Replacement Value	\$6,285,387
		Value per user	\$84,916

Asset ID	Function Code	Location	Address	Location	DWG Ref	Major	Minor	Spec	Asset Code		Photo	Description	Make	Model	Material	Asset Inventory		Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Condition Assessment			Recommendations / Action Items	Type of Work	10 Year Capital Plan		Comments/Question to be resolved					
									ID	Asset Code						Quantity	Quantity Unit									Probability of Failure	Severity of Failure	Condition			Budget Estimate	Timing						
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	STP	1	S-5TP-STP-1	7 to 35	Sewage treatment plant building				1	ea	2008		40	30		\$150,000	\$150,000	Good - fenced and gated	Meets standard	Demand Condition	2	2	4	Inspect/assess equalization and anoxic tanks, digester a	Operations	Included above	5-10 Year	Refer to Twin Cedars Sewer System Building Condition Assessment			
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	ET	2	S-5TP-ET-2	10	Equalization tank				1	ea	2008		40	30	\$150,000	\$150,000	Good - some odour/complaints	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Inspect/assess equalization and anoxic tanks, digester a	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	AT	3	S-5TP-AT-3	10	Anoxic tank				1	ea	2008		40	30	\$150,000	\$150,000	Good	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Inspect/assess equalization and anoxic tanks at STP for det	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	FKR	4	S-5TP-FKR-4	13	Digester c/w membrane bioreactors				4	LS	2008		40	30	\$550,000	\$800,000	Good - membranes are replaced every 10 years	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Inspect/assess digester and membranes at STP for dete	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	GEN	8	S-5TP-GEN-8	12	Generator, 80 kW (STP Hutchison rd)				1	ea	2008		40	30	\$100,000	\$100,000	Good	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	1	2	1	Inspect/assess generator and membranes at STP for dete	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	UV	9	S-5TP-UV-9	13 to 32	UV filter unit				2	ea	2008		20	10	\$60,000	\$60,000	Good	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Inspect/assess UV reactors at STP for deterioration to det	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	PP	15	S-5TP-PP-15	15, 20, 22, 23, 24, 31, 33	Process piping c/w valves, pipes, tees				1	LS	2008		40	30	\$200,000	\$200,000	Good	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Inspect/assess process piping in STP for deterioration to d	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	COM	12	S-5TP-COM-12	24, 26, 28, 29	Communications (STP Hutchison rd)				1	LS	2008		10	0	\$20,000	\$20,000	Good	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Review system to improve controls of STP to improve sy	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	PMP	13	S-5TP-PMP-13	15, 20, 22, 23, 24, 31, 32	Pump (STP)				8	ea	2008		20	10	\$5,000	\$40,000	Good - permeable and recycle pumps	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Inspect/assess pumps in STP for deterioration to determi	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	CH	21	S-5TP-CH-21	31 to 33	Chlorine system c/w tank, analyser				1	LS	2008		20	10	\$35,000	\$35,000	Good	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Inspect/assess chlorine system in STP for deterioration fo	Operations	Included above	5-10 Year					
1	803	1413 Hutchison rd	Sewage treatment plant (Hutchison rd)		Site Visit / Photos	S	STP	BLW	22	S-5TP-BLW-22	20, 22	Blowers				5	ea	2008		20	10	\$30,000	\$150,000	Good - very loud (2 for EQ tank, 3 for reactor)	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Upgrade to more efficient and quieter blowers in STP.	Capital Upgrade/New	Included above	5-10 Year	\$150,000				
2	803	1413 Hutchison rd	RIB Inlet (Hutchison STP)		Site Visit / Photos	S	STP	RF	27	S-5TP-RF-27	89 to 91	Rapid Infiltration Basin system (RIB) c/w process piping, valves				1	LS	2011		80	73	\$150,000	\$150,000	Good - 6 fields	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	2	4	Inspect/assess Rapid Infiltration system for deterioration	Operations	Included above	5-10 Year	\$5,000				
3	803	1413 Hutchison rd	Hutchison rd lift station 3518 Twin cedars dr.		011497-20	S	LS	LS	28	S-LS-LS-28	2 to 6	Lift station (Hutchison)				1	ea	2008		40	30	\$500,000	\$500,000	Good - fenced and gated, standby power from generator at STP	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	3	1	Inspect/assess lift station for deterioration to determine	Operations	Included above	2-5 Year					
3	803	1413 Hutchison rd	Hutchison rd lift station 3518 Twin cedars dr.		011497-20	S	LS	PMP	29	S-LS-PMP-29	4	Pump, solids handling submersible pump, 3.7kW, 575/1/60Hz	Myers	4VC30M4-53-50		2	ea	2008		40	30	\$8,000	\$14,000	Good	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	3	1	Inspect/assess lift station for deterioration to determine	Operations	Included above	2-5 Year					
3	803	1413 Hutchison rd	Hutchison rd lift station 3518 Twin cedars dr.		011497-20	S	LS	COM	31	S-LS-COM-31	3, 4	Valve chamber c/w process piping, valves, concrete chamber				1	ea	2008		40	30	\$60,000	\$60,000	Good	Meets standard	Ability to accommodate a larger service area (100% redundancy), some odour complaints	2	3	1	Inspect/assess lift station for deterioration to determine	Operations	Included above	2-5 Year					
4	803	1413 Hutchison rd	Fisher rd 0-1000 - 0-203, off Height at 1-0208-1-110		2240-2	S	FM	PP	32	S-FM-PP-32		Reclaimed Effluent pipe, 75mm				235	m	2013		80	75	\$475	\$99,875								Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year				
4	803	1413 Hutchison rd	Fisher rd 0-203 - 0-426		2240-2	S	FM	PP	33	S-FM-PP-33		Reclaimed Effluent pipe, 100mm				223	m	2013		80	75	\$470	\$105,300								Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year				
4	803	1413 Hutchison rd	Fisher rd 0-1000 - 0-203		2240-2	S	FM	PP	34	S-FM-PP-34		Force main, 50mm				148	m	2013		80	75	\$400	\$17,200									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year			
4	803	1413 Hutchison rd	Fisher rd 0-203 - 0-426		2240-2	S	FM	PP	35	S-FM-PP-35		Force main, 75mm				223	m	2013		80	75	\$475	\$94,725									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year			
4	803	1413 Hutchison rd	Fisher rd 0-1000 - 0-203		2240-2	S	FM	VAL	36	S-FM-VAL-36		Valve, 50mm				1	ea	2013		40	35	\$1,500	\$1,500									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year			
4	803	1413 Hutchison rd	Fisher rd 0-1000 - 0-203		2240-2	S	FM	VAL	37	S-FM-VAL-37		Valve, 75mm				7	ea	2013		40	35	\$2,000	\$14,000									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year			
4	803	1413 Hutchison rd	Fisher rd 0-1000 - 0-203		2240-2	S	FM	VAL	44	S-FM-VAL-44		Valve, 100mm				1	ea	2013		40	35	\$2,500	\$2,500									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year			
4	803	1413 Hutchison rd	Fisher rd 0-1000 - 0-203		2240-2	S	FM	VAL	45	S-FM-VAL-45		Valve, 100mm				1	ea	2013		40	35	\$2,500	\$2,500									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year			
4	803	1413 Hutchison rd	Fisher rd 0-1000 - 0-203		2240-2	S	FM	VAL	47	S-FM-VAL-47		Effluent air release valve c/w concrete chamber	Valmatic	VM-48A-4		2	ea	2013		20	15	\$15,000	\$30,000									Assess/inspect air release valve chambers for deteriorat	Operations	Included above	5-10 Year			
5	803	1413 Hutchison rd	Galliers Discharge Field, Pine St, Process Ave, Fairfield Rd, Garland Rd and Fish		2240-3	S	FM	PP	48	S-FM-PP-48		Sanitary Pipe, 75mm				750	m	2013		80	75	\$475	\$18,750									Assess/inspect force mains for deterioration to determ	Operations	Included above	5-10 Year			
5	803	1413 Hutchison rd	Galliers Discharge Field, Pine St, Process Ave, Fairfield Rd, Garland Rd and Fish		2240-3	S	FM	PP	49	S-FM-PP-49		Sanitary Pipe, 100mm				750	m	2013		80	75	\$470	\$18,750									Assess/inspect force mains for deterioration to determ	Operations	Included above	5-10 Year			
5	803	1413 Hutchison rd	Galliers Discharge Field, Pine St, Process Ave, Fairfield Rd, Garland Rd and Fish		2240-3	S	FM	SV	50	S-FM-SV-50		Service Connections				26	ea	2013		40	35	\$1,500	\$39,000									Assess/inspect force mains for deterioration to determ	Operations	Included above	5-10 Year			
5	803	1413 Hutchison rd	Galliers Discharge Field, Pine St, Process Ave, Fairfield Rd, Garland Rd and Fish		2240-3	S	FM	CO	76	S-FM-CO-76		Flush Out, 75mm				3	ea	2013		40	35	\$2,400	\$6,000									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year			
5	803	1413 Hutchison rd	Galliers Discharge Field, Pine St, Process Ave, Fairfield Rd, Garland Rd and Fish		2240-3	S	FM	CO	79	S-FM-CO-79		Flush Out, 100mm				3	ea	2013		40	35	\$2,500	\$7,500									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year			
5	803	1413 Hutchison rd	Galliers Discharge Field, Pine St, Process Ave, Fairfield Rd, Garland Rd and Fish		2240-3	S	FM	VAL	82	S-FM-VAL-82		Sewage air release valve c/w concrete chamber	Valmatic	VM-48A-4		4	ea	2013		20	15	\$15,000	\$60,000									Assess/inspect air release valve chambers for deteriorat	Operations	Included above	5-10 Year			
5	803	1413 Hutchison rd	Galliers Discharge Field, Pine St, Process Ave, Fairfield Rd, Garland Rd and Fish		2240-3	S	FM	VAL	86	S-FM-VAL-86		Effluent air release valve c/w concrete chamber	Valmatic	VM-2012-2		4	ea	2013		20	15	\$15,000	\$60,000									Assess/inspect air release valve chambers for deteriorat	Operations	Included above	5-10 Year			
6	803	1413 Hutchison rd	Bonner creek, land lot 35 easement		011497-20	S	SS	S	87	S-SS-S-87		Sewer main, 200mm				SDR35	PVC	458	m	2008		40	30	\$550	\$152,100									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year	
6	803	1413 Hutchison rd	Bonner creek, land lot 35 easement		011497-20	S	SS	MH	88	S-SS-MH-88		Sewer manhole, 1.2 x 3.5m depths					11	ea	2008		40	30	\$8,000	\$88,000										Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year	
7	803	1413 Hutchison rd	Farfield Rd Sta 6-0203 to 6-200		2240-4	S	FM	PP	89	S-FM-PP-89		Force main, 50mm				Series 200	PVC	180	m	2013		80	75	\$475	\$79,500									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year	
7	803	1413 Hutchison rd	Farfield Rd		2240-4	S	FM	SV	90	S-FM-SV-90		Service Connections				Series 200	PVC	2	ea	2013		40	35	\$1,500	\$3,000									Assess/inspect force mains and air release valve chamber	Operations	Included above	5-10 Year	
7	803	1413 Hutchison rd	Farfield Rd		2240-4	S	FM	VAL	91	S-FM-VAL-91		Sewage air release valve c/w concrete chamber	Valmatic	VM-48A-4		1	ea	2013		20	15																	

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**LIFT STATION  
FIELD INSPECTION**

MORRISON HERSHFIELD

SYSTEM: Twin Cedars Sewer DATE: Nov. 22/17  
SYSTEM CODE: 803 PROJECT No.: 5170700  
INSPECTED BY: Adam CVRD STAFF PRESENT: David

1) Site Conditions

2) Building Conditions

3) Condition of wet well:  
Visible Deterioration of structure and hatch:

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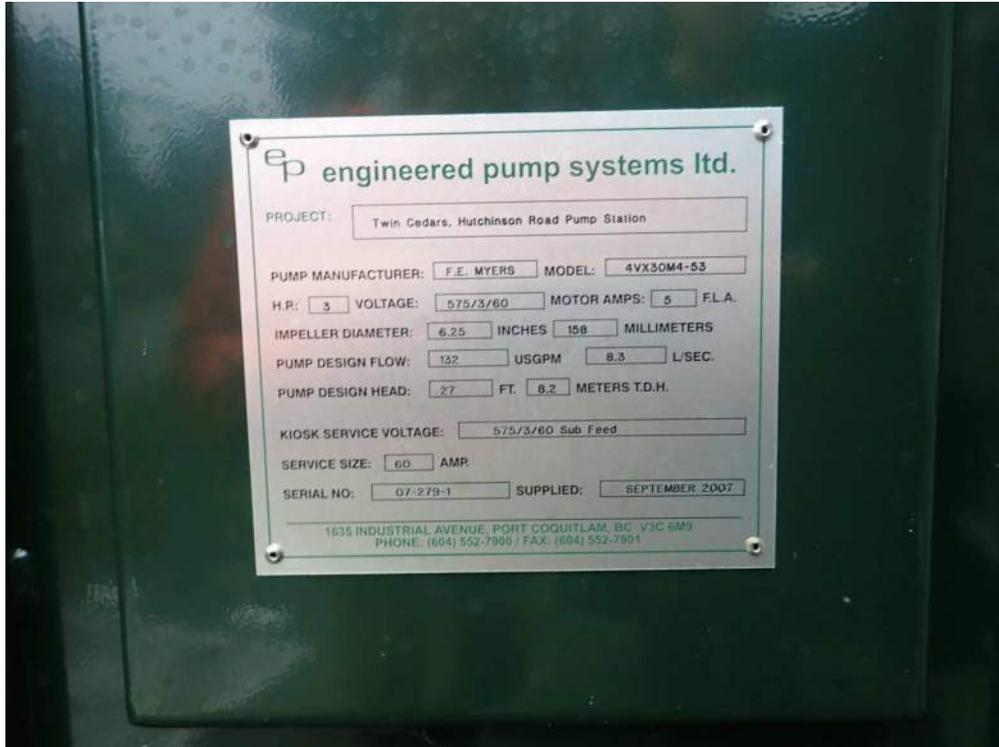


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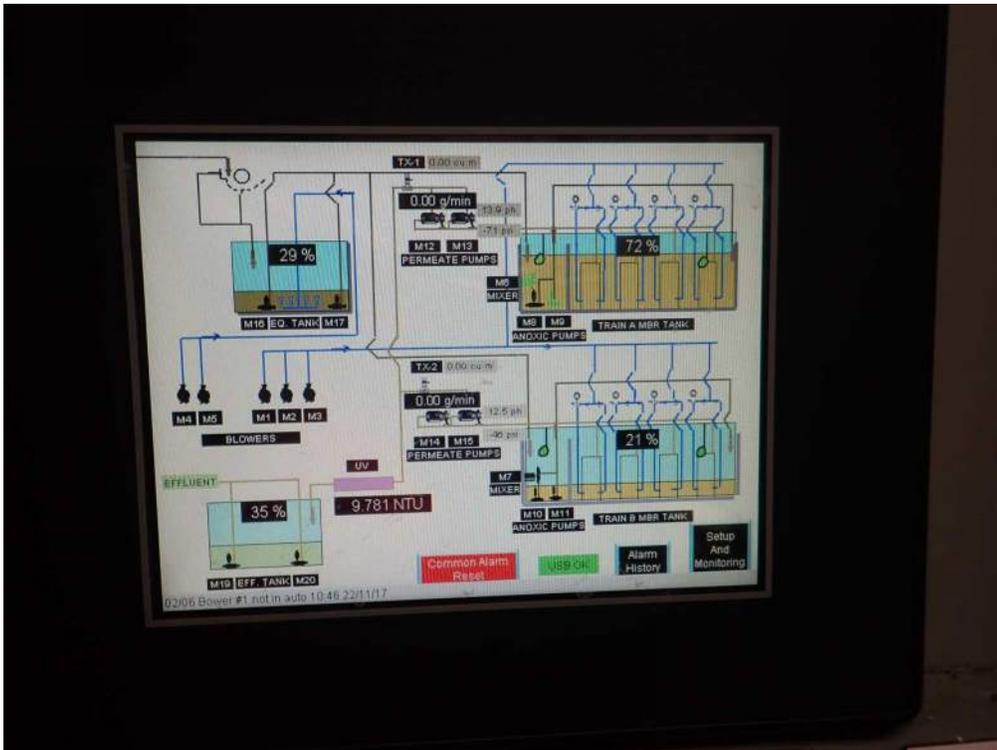


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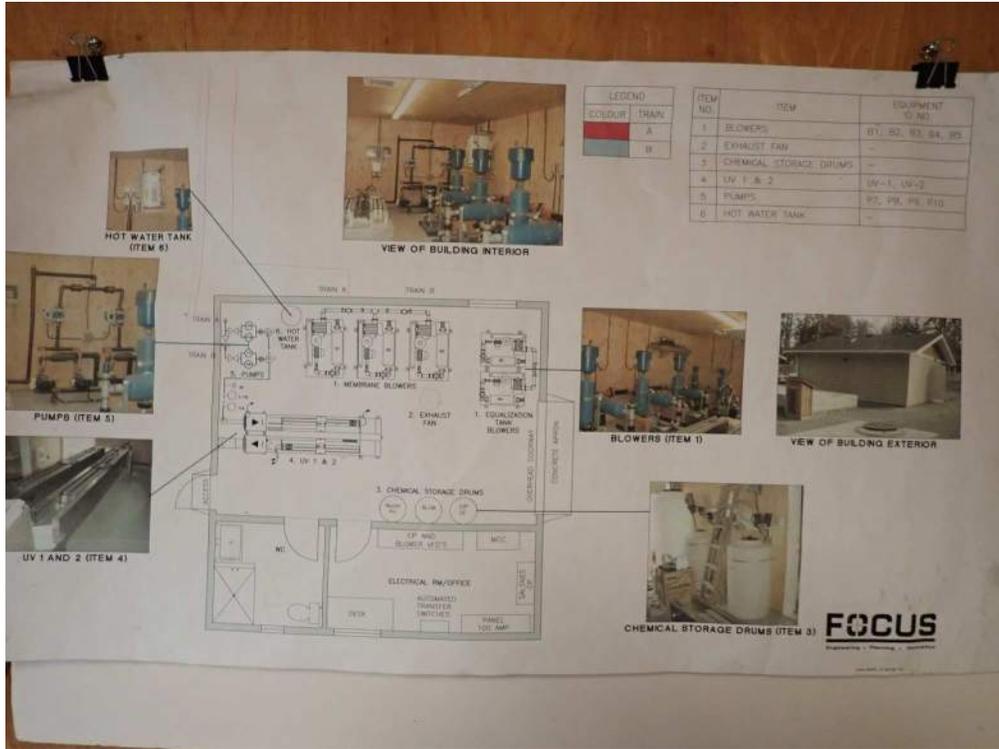


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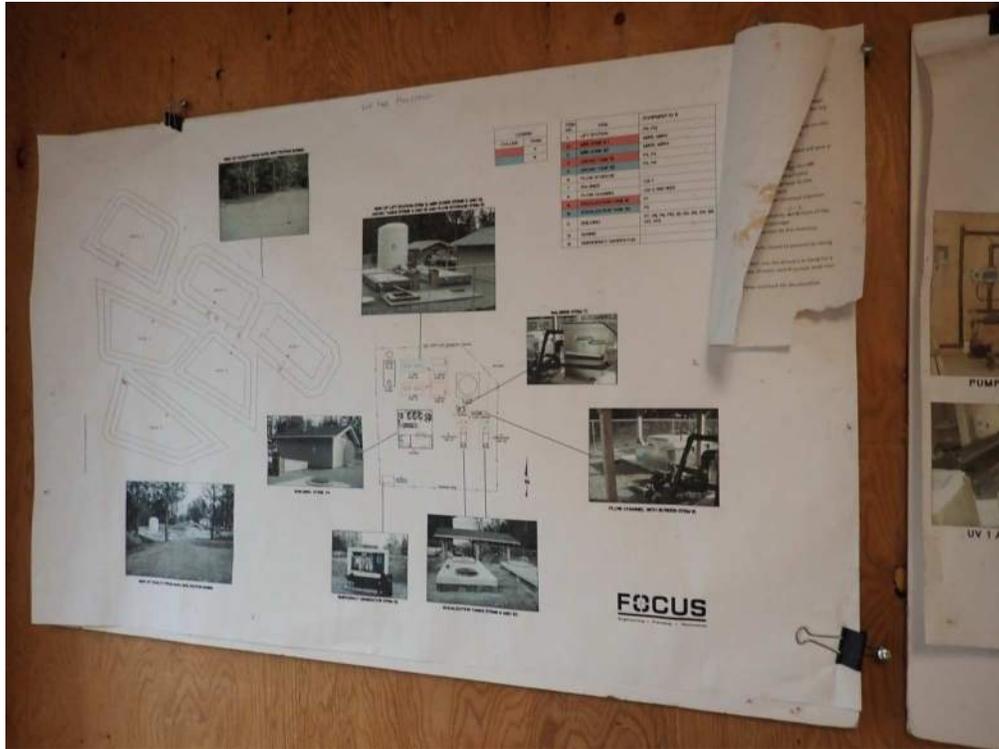


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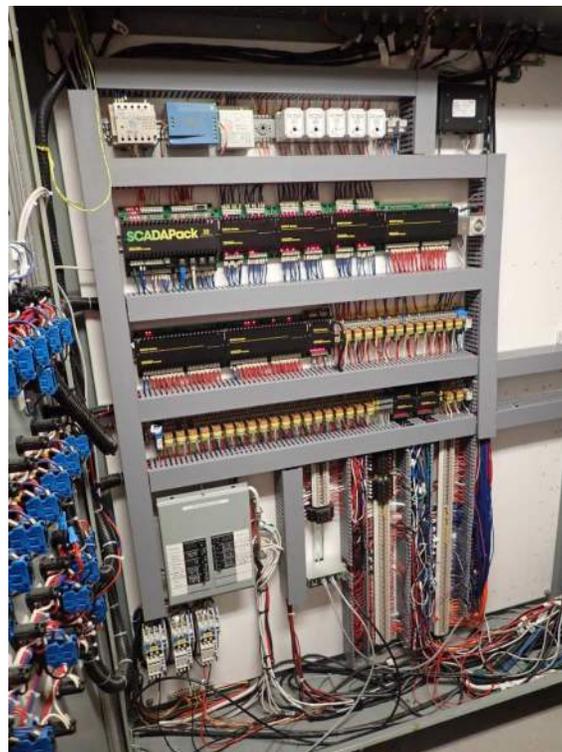


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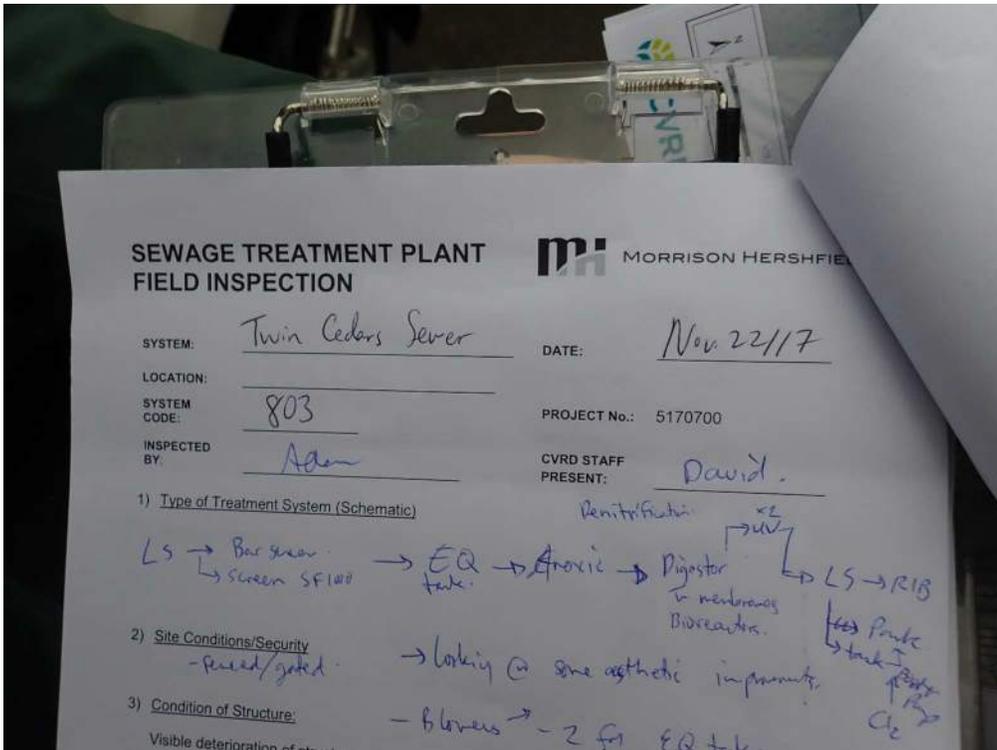


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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Twin Cedars Sewer - Sewer Treatment Plant- Functional Code 803**

BUDG Name	BUDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	OPINION OF PROBABLE COST									
						ID	Location / Type		Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age In 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority					Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total In 2017 Dollars		
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations.	4	4	2008	21-Nov-17	MH	10	50	40	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	650	\$30	SF	\$19,500	0%	5%	5%	\$22,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2008	21-Nov-17	MH	10	50	40	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	650	\$30	SF	\$19,500	0%	5%	5%	\$22,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2008	21-Nov-17	MH	10	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2008	21-Nov-17	MH	10	50	40	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2008	21-Nov-17	MH	10	50	40	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	650	\$30	SF	\$19,500	0%	5%	5%	\$22,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2008	21-Nov-17	MH	10	12	2	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	650	\$8	SF	\$5,200	0%	15%	5%	\$7,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2008	21-Nov-17	MH	10	50	40	The cementitious siding is expected to last the life of the building.  Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	650	\$35	SF	\$22,750	0%	5%	5%	\$26,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit		1	Perforated metal soffit is present at the roof overhangs.	4	4	2008	21-Nov-17	MH	10	50	40	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$20	SF	\$2,000	0%	10%	5%	\$3,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	C820 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/ Windows		1	Two vinyl framed windows are present on the building.	4	4	2008	21-Nov-17	MH	10	25	15	Replace windows at the end of their service lives.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$200	EA	\$400	0%	10%	5%	\$1,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	E2030 Exterior Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	One painted metal door is present on the building.	4	4	2008	21-Nov-17	MH	10	30	20	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	E2030 Exterior Enclosure	E2030 Exterior Doors	B203004 Overhead and Roll-up Doors	Exterior Walls/ Door		1	One metal overhead door is present.	4	4	2008	21-Nov-17	MH	10	20	10	Replace doors at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2008	21-Nov-17	MH	10	25	15	Replace the roof assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	700	\$30	SF	\$21,000	0%	5%	5%	\$24,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2008	21-Nov-17	MH	10	25	15	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	50	\$10	SF	\$500	0%	10%	5%	\$1,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2 & 3		The interior plywood walls are not painted, the interior gypsum ceiling is painted.	4	4	2008	21-Nov-17	MH	10	20	10	Repaint interiors as required. It is assumed that the walls will be painted at this time.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	0%	5%	\$2,000
Twin Cedars Sewer Sewer Treatment Plant	Sewer Building	803	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	4	4	2008	21-Nov-17	MH	10	20	15	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Twin Cedars Sewer - Sewer Treatment Plant- Functional Code 803



Photo 1



Photo 2

Cowichan Valley Regional District

Twin Cedars Sewer - Sewer Treatment Plant- Functional Code 803



Photo 3

## 804 - Lambourn Estates Sewer

Infrastructure Condition Assessment and Capital Plan  
1226 Sutherland Dr, Cowichan Bay, BC

Date Prepared

July 18, 2018

### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$5,617,168	
Number of Users	155	
Replacement Cost Per User	\$36,240	
Annual Replacement Cost (40 Years)	\$61,391	per year
Annual Replacement Cost (80 Years)	\$42,480	per year
10 Year Capital Plan Total	\$120,000	
10 Year Operations and Maintenance Plan Total	\$105,000	

### PROPERTY DESCRIPTION

The system was originally constructed in 1967, however, limited information is available about what was

Development	Year Installed	Source
Collection System	1990	CVRD Input
Lambourne Drive	1993	Record Drawings (8619)
Sutherland Drive	2001	Record Drawings (10126BSJ)
Hurtin Road and Antoine View Place	2006	Record Drawing (010788-20-01-ABS)
Sutherland Drive	2008	Record Drawings (01075-20)
Polo Field Place Lift Station	2009	Record Drawings (010745-20-01-ABS)
Sewage Treatment Plant	2011	Record Drawing (30200442)
Lanes Road	2013	Record Drawing (11231109)
Mobile Park	2013	Record Drawing (CI-02-LAM)
Sutherland Drive	2015	Record Drawing (2014-02647)

### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
Todd Etherington, Utility Operations Superintendent  
David Parker, Engineering Technologist III  
Rob Grant, GIS Supervisor  
Andrea Kross, GIS Technician I  
Adam Greenwood, Project Engineer  
Kieran Bertsch, E.I.T.  
Caleb Light, GIS

### CONTACT INFORMATION

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[dparker@cvrd.bc.ca](mailto:dparker@cvrd.bc.ca)  
[rgrant@cvrd.bc.ca](mailto:rgrant@cvrd.bc.ca)  
[akross@cvrd.bc.ca](mailto:akross@cvrd.bc.ca)  
[agreenwood@morrisonhershfield.com](mailto:agreenwood@morrisonhershfield.com)  
[kbertsch@morrisonhershfield.com](mailto:kbertsch@morrisonhershfield.com)  
[clight@morrisonhershfield.com](mailto:clight@morrisonhershfield.com)

## 804 - Lambourn Estates Sewer

Infrastructure Condition Assessment and Capital Plan  
1226 Sutherland Dr, Cowichan Bay, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 6, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 3, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 804 - Lambourne Estates Sewer

Infrastructure Condition Assessment and Capital Plan

1226 Sutherland Dr, Cowichan Bay, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-STP-FTR-6	Capital Renewal	Replace membrane filters in STP.	\$120,000	\$120,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$120,000

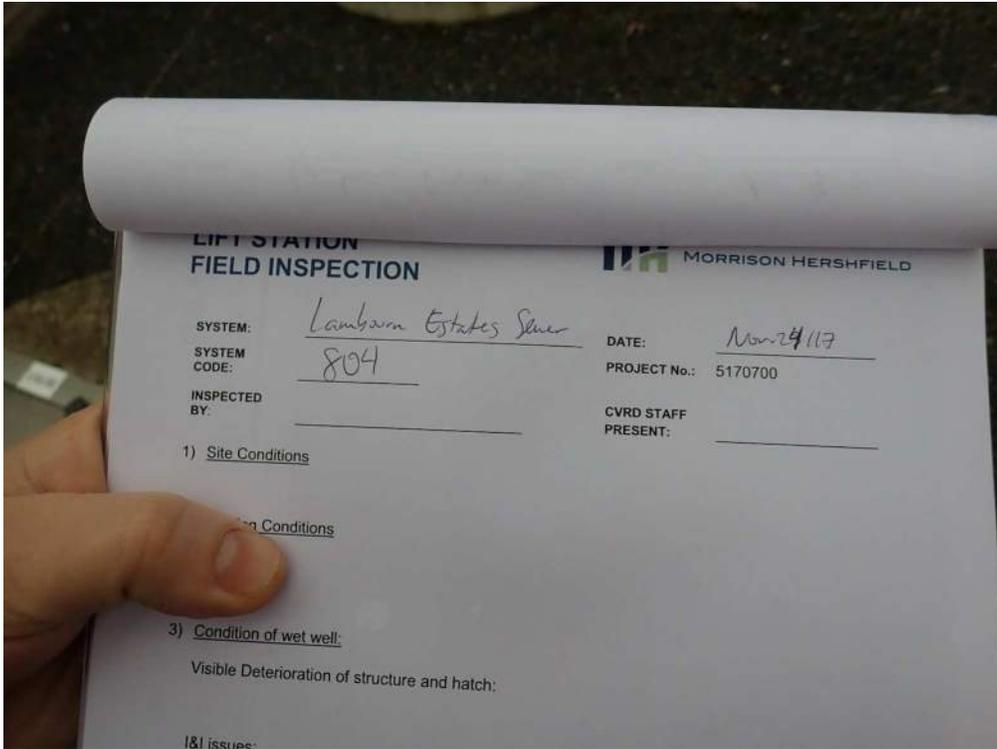
**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	ALL	Operations	Inspect/assess Polo Field Pl. lift station for deterioration to determine replacement timing/phasing.	\$10,000	\$10,000
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	1	ALL	Operations	Assess/Inspect wastewater treatment plant for deterioration to determine replacement timing/phasing.	\$20,000	\$95,000
	14	6, 8, 10, 11 and 13	As Noted	Operations	Assess/Inspect forcemains and air release valves for deterioration to determine replacement timing/phasing.	\$35,000	
	15	15 to 26	As Noted	Operations	Assess/Inspect collection system for sources of I&I and determine replacement timing/phasing.	\$40,000	
	16						
	17						
						Total	\$105,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (1)



804 (2)  
1 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (3)



804 (4)  
2 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (5)



804 (6)  
3 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (7)



804 (8)  
4 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (9)

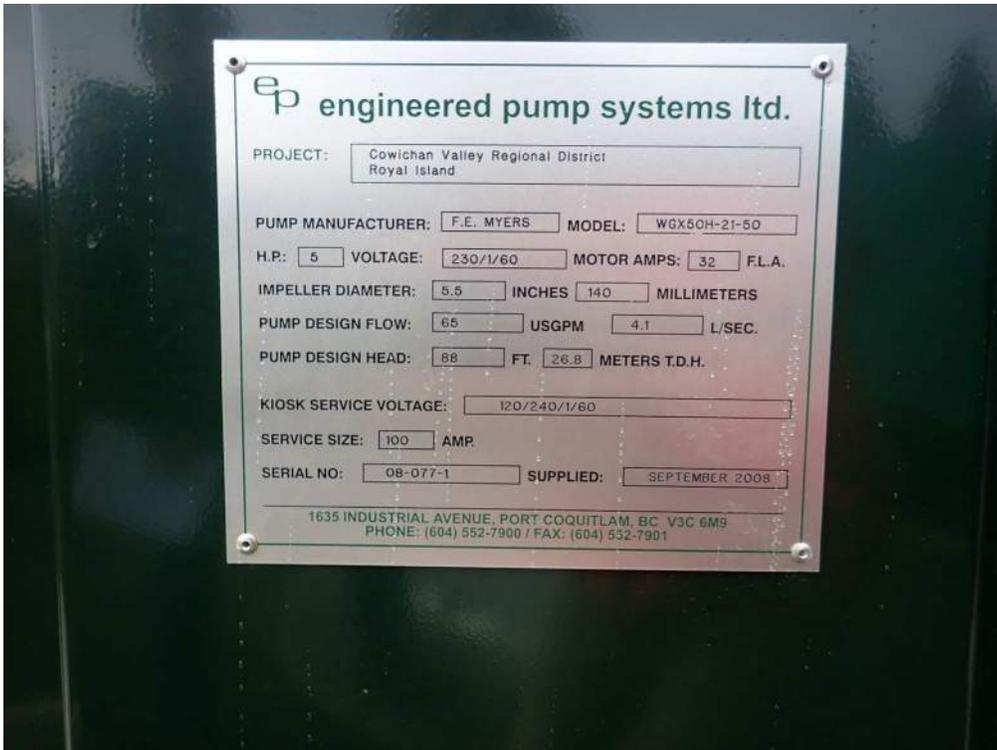


804 (10)  
5 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

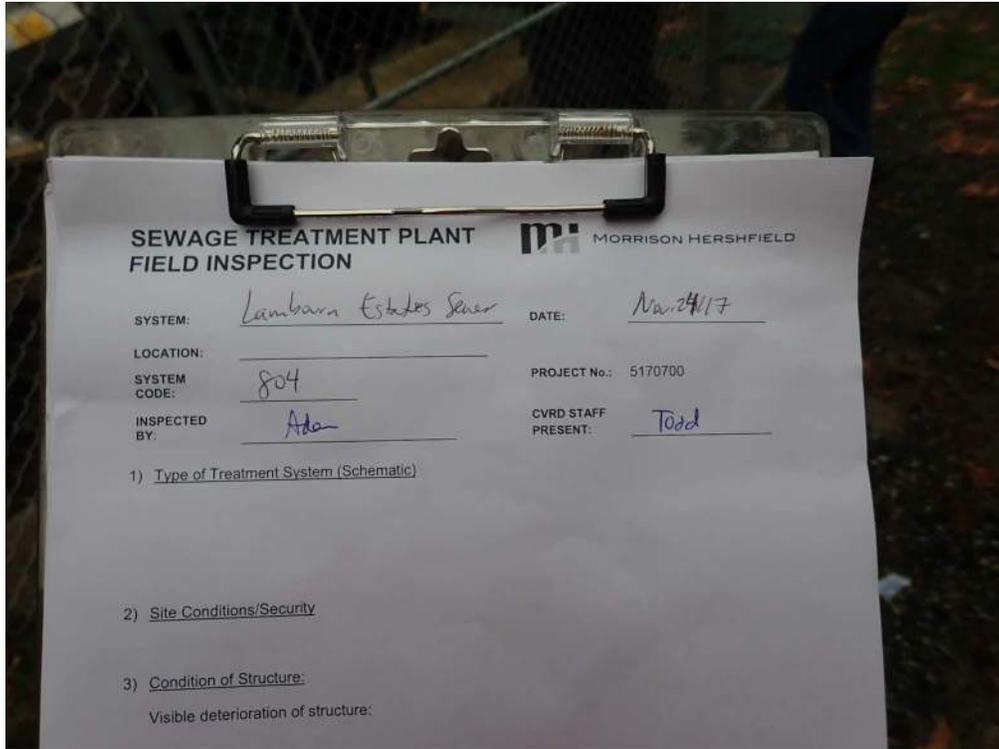


804 (11)



804 (12)  
6 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (13)



804 (14)  
7 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (15)



804 (16)  
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804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (17)



804 (18)  
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804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (19)



804 (20)  
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804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (21)



804 (22)  
11 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (23)



804 (24)  
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804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (25)



804 (26)  
13 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (27)



804 (28)  
14 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

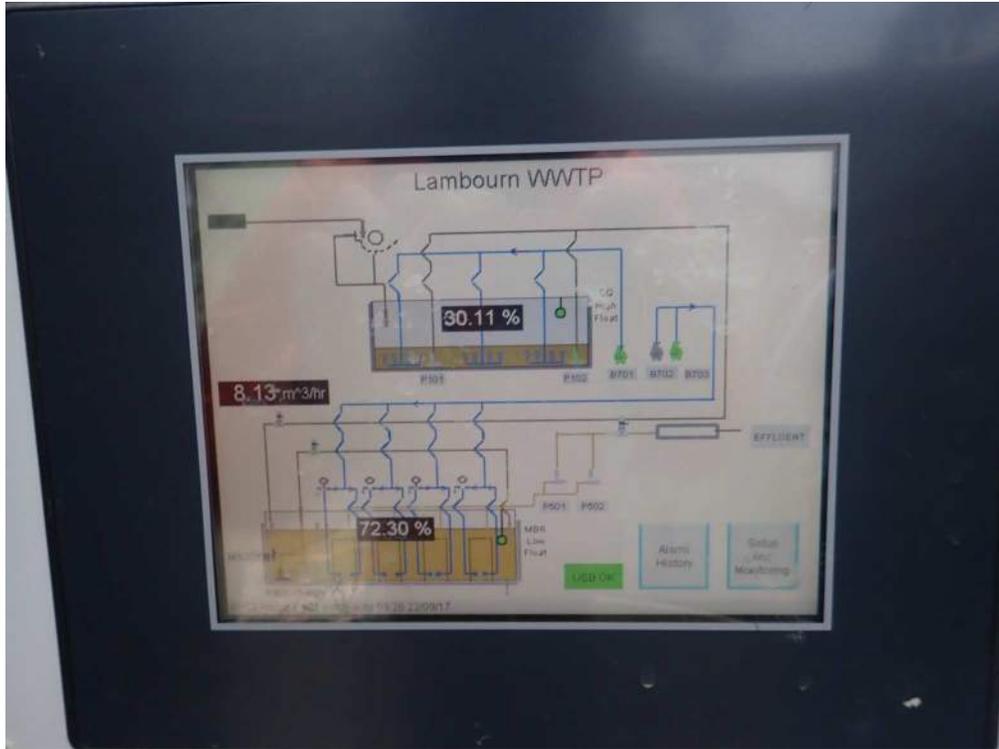


804 (29)



804 (30)  
15 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (31)



804 (32)  
16 of 17

804 Lambourn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



804 (33)

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Lambourn Estates Sewage - Sewage Treatment Plant - Functional Code 804**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	Description & History	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings' security of safety?	OPINION OF PROBABLE COST								
						ID	Location / Type			Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Schedule Repair or Replacement Cost	Consult	Contingency	5% Tax	Total in 2017 Dollars
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	4	4	2011	21-Nov-17	MH	7	50	43	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$20	SF	\$2,000	0%	5%	5%	\$3,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2011	21-Nov-17	MH	7	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$10	SF	\$1,000	0%	5%	5%	\$2,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2011	21-Nov-17	MH	7	50	43	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$40	SF	\$4,000	0%	5%	5%	\$5,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2011	21-Nov-17	MH	7	12	5	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	140	\$8	SF	\$1,120	0%	15%	5%	\$2,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2011	21-Nov-17	MH	7	50	43	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	140	\$35	SF	\$4,900	0%	5%	5%	\$6,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	2011	21-Nov-17	MH	7	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	2011	21-Nov-17	MH	7	30	23	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. The roof is edge drained.	4	4	2011	21-Nov-17	MH	7	40	33	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations. Ongoing reviews should be completed at the pole penetration through the roof.	Replacement	3 - Future Renewal	No	Yes	No	No	120	\$30	SF	\$3,600	0%	5%	5%	\$4,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		The interior gypsum and plywood walls and ceilings are painted.	4	4	2011	21-Nov-17	MH	7	20	13	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2011	21-Nov-17	MH	7	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Lambourn Estates Sewage - Sewage Treatment Plant - Functional Code 804

BUD Name	BUD Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST										10-YEAR CAPITAL PLAN														
						ID	Location / Type	Photo	Description & History	Condition	Performance	Year of Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining to OOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Contract	Contingency	5% Tax	Total 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027			
																																	\$0	\$0	\$0	\$0	\$2,000	\$0	\$0	\$0	\$0	\$0	\$0		
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations.	4	4	2011	21-Nov-17	MH	7	50	43	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$20	SF	\$2,000	0%	5%	5%	\$3,000												
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	A Substructure	A10 Foundations	A1010 Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2011	21-Nov-17	MH	7	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$10	SF	\$1,000	0%	5%	5%	\$2,000												
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2011	21-Nov-17	MH	7	50	43	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$40	SF	\$4,000	0%	5%	5%	\$5,000												
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	B Shell	C80 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2011	21-Nov-17	MH	7	12	5	Repaint siding and trim. At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	140	\$8	SF	\$1,120	0%	15%	5%	\$2,000												
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Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes			The interior gypsum and plywood walls and ceilings are painted.	4	4	2011	21-Nov-17	MH	7	20	13	Repaint interiors as required. Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000												
Lambourn Estates Sewage - Sewage Treatment Plant	Sewage Building	804	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment			An exterior light is present on the building near the entrance.	4	4	2011	21-Nov-17	MH	7	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000												

Cowichan Valley Regional District

Lambourn Estates Sewer - Water Treatment Building - Functional Code 804



Photo 1



## 805 - Arbutus Mountain Estates Sewer

Infrastructure Condition Assessment and Capital Plan

1112 Fitzgerald Rd, Shawnigan Lake, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 7, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 3, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 805 - Arbutus Mountain Estates Sewer

Infrastructure Condition Assessment and Capital Plan

1112 Fitzgerald Rd, Shawnigan Lake, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	S-STP-PTU-1	Capital Renewal	Install inlet screen (a requirement for Phase 3) and assess/inspect wastewater treatment plant, UV units, odour control system, and communication system for deterioration to determine replacement timing/phasing.	\$100,000	\$100,000
	11						
	12						
						<b>Total</b>	<b>\$100,000</b>

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2 to 4	ALL	Operations	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.	\$20,000	\$20,000
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	5, 6 and 15	ALL	Operations	Assess/Inspect forcemains and air release valve chambers for deterioration to determine replacement timing/phasing.	\$35,000	\$65,000
	14	9 to 14	ALL	Operations	Assess/Inspect sewer mains for deterioration to determine replacement timing/phasing. Review sources of I&I to reduce peak flows.	\$20,000	
	15	17	ALL	Operations	Assess/Inspect disposal field for deterioration to determine replacement timing/phasing.	\$10,000	
	16						
	17						
						<b>Total</b>	<b>\$85,000</b>

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

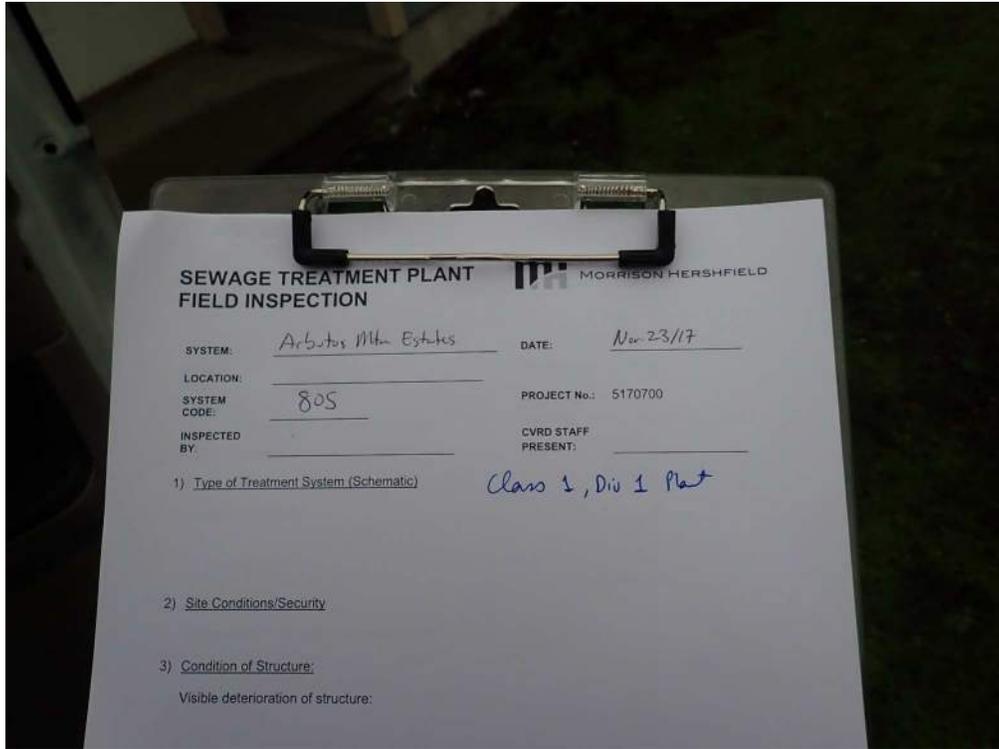
Owner:	Cowichan Valley Regional District (CVRD)
System:	Arbutus Mountain Estates Sewer
Civic Address:	1112 Fitzgerald Rd
Geographic Location:	South of Shawanigan Lake
Customers:	123
Users:	121

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$4,794,942
		Value per user	\$39,628

Asset ID	Function Code	Location	Address	Location	DWG Ref	Major	Minor	Spec	Asset Code		Photo	Description	Make	Model	Material	Asset Inventory		Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Condition Assessment				Recommendations / Action Items	Type of Work	10 Year Capital Plan						
									ID	Asset Code						Quantity	Quantity Unit							Physical Condition	Functional Condition	Demand Condition	Probability of Failure			Severity of Failure	Condition	Budget Estimate	Timing	Comment/Question to be resolved		
1	805	1112 Fitzgerald Rd		Sewage treatment plant	05-131	S	STP	FTU	1	S-STP-FTU-1	24 to 29	Packaged Con sewage treatment unit				1	ea	2007		40	29	\$600,000	\$600,000	Fair - no inlet screen. Inlet Screen required prior to phase 3 of the development proceeding	Meets standard - there is an	able to meet capacity (current flows 60	2	2	4	Install inlet screen in accordance with Phase 3) and assess/inspect wastewater treatment plant, UV units, odour control system, and communication system for deterioration to determine replacement timing/phasing.	Capital Renewal	\$100,000	5-10 Year			
1	805	1112 Fitzgerald Rd		Sewage treatment plant	Site Visit / Photos	S	STP	STP	2	S-STP-STP-2	2 to 5, 9, 12 to 29	Sewage treatment plant building				1	ea	2007		40	29	Refer to Arbutus Mountain Estates Sewer System Building Condition Assessment.	Good - locked house, large windows	Meets standard							Refer to Arbutus Mountain Estates Sewer System Building Condition Assessment.					
1	805	1112 Fitzgerald Rd		Sewage treatment plant	Site Visit / Photos	S	STP	UV	3	S-STP-UV-3	12 to 14	UV unit				2	ea	2007		20	9	\$10,000	\$20,000	Good	Meets standard				2	2	4	Assess/inspect UV units for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
1	STP	1112 Fitzgerald Rd		Sewage treatment plant	Site Visit / Photos	S	STP	FTR	5	S-STP-FTR-5	10	PURAFIL Odour Control System		PURAFIL		1	ea	2007		20	9	\$15,000	\$15,000	Good	Meets standard				2	2	4	Assess/inspect odour control system for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
1	805	1112 Fitzgerald Rd		Sewage treatment plant	Site Visit / Photos	S	STP	COM	6	S-STP-COM-6	16 to 20	Communications (STP)				1	LS	2007		10	0	\$20,000	\$20,000	Good	Meets standard				2	2	4	Assess/inspect communication system for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
1	805	1112 Fitzgerald Rd		Sewage treatment plant	Site Visit / Photos	S	STP	GEN	7	S-STP-GEN-7	8, 11	Generator (STP)				1	ea	2007		40	29	\$60,000	\$60,000	Good	Meets standard				1	1	5					
1	805	1112 Fitzgerald Rd		Sewage treatment plant	Site Visit / Photos	S	STP	BLW	8	S-STP-BLW-8	4, 5	Blower		Emayor	X2	3	ea	2007		20	9	\$15,000	\$45,000	Good	Meets standard				1	1	5					
2	805	1112 Fitzgerald Rd		NW of Sewer Treatment Plant (STP)	1483	S	LS	WW	11	S-LS-WW-11	7	Untreated Sanitary sewer lift station, 1800mm precast concrete manhole				1	ea	2007		40	29	\$300,000	\$300,000	Good	Meets standard				2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.	Operations	\$20,000	2-5 Year	
2	805	1112 Fitzgerald Rd		Untreated LS	1483	S	LS	PMP	12	S-LS-PMP-12	7	Duplex pump - (4.75 impeller) 5.0 hp, 1750rpm, 575 volt. Three phase	Myers	4R x 50M4-53		2	ea	2007		20	9	\$5,000	\$10,000	Good	Meets standard				2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.	Operations	Included above	2-5 Year	
3	805	1112 Fitzgerald Rd		SW of Sewer Treatment Plant (STP)	1483	S	LS	WW	14	S-LS-WW-14	6	Treated sanitary sewer lift station, 1800mm precast concrete manhole				1	ea	2007		40	29	\$300,000	\$300,000	Good	Meets standard				2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.	Operations	Included above	2-5 Year	
3	805	1112 Fitzgerald Rd		Treated LS	1483	S	LS	PMP	15	S-LS-PMP-15	6	Duplex pump - (4.75 impeller) 7.5 hp, 575 volt. Three phase	Myers	3RH x 75M2-53		2	ea	2007		20	9	\$7,500	\$15,000	Good	Meets standard				2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.	Operations	Included above	2-5 Year	
4	805	1112 Fitzgerald Rd		Shawanigan lake rd 0-988.5	1483	S	LS	WW	17	S-LS-WW-17	NA	Wastewater lift station, el. = 191.649				1	ea	2006		40	28	\$500,000	\$500,000						2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.	Operations	Included above	2-5 Year	
5	805	1112 Fitzgerald Rd		Shawanigan lake rd 0-988.5 to 1-000	1483	S	FM	PP	19	S-FM-PP-19		Forcemain pipe, 150mm		Series 160	PVC	12	m	2006		80	68	\$500	\$6,000						1	3	4	Assess/inspect forcemains and air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	\$35,000	5-10 Year	
5	805	1112 Fitzgerald Rd		Shawanigan lake rd 1-000 to 2-050	1483	S	FM	PP	18	S-FM-PP-18		Forcemain pipe, 150mm, min 1.2m depth		DR 17	HDPE	1050	m	2006		80	68	\$500	\$525,000						1	3	4	Assess/inspect forcemains and air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
5	805	1112 Fitzgerald Rd		Shawanigan lake rd 2-050 to 2-160	1483	S	FM	PP	24	S-FM-PP-24		Forcemain pipe, 150mm, min 1.2m depth		DR 11	HDPE	110	m	2006		80	68	\$500	\$55,000						1	3	4	Assess/inspect forcemains and air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
5	805	1112 Fitzgerald Rd		Shawanigan lake rd 2-160 to 2-190	1483	S	FM	VAL	20	S-FM-VAL-20		Air Release/Vacuum Valve, high point = 200.558		10L.5		1	ea	2006		40	28	\$5,000	\$5,000						2	2	4	Assess/inspect air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
5	805	1112 Fitzgerald Rd		Shawanigan lake rd 2-190 to 2-210	1483	S	FM	VAL	21	S-FM-VAL-21		Air Release valve, el. = 186.380		201 C.2		1	ea	2006		40	28	\$5,000	\$5,000						2	2	4	Assess/inspect air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
5	805	1112 Fitzgerald Rd		Shawanigan lake rd 2-210 to 2-230	1483	S	FM	VAL	22	S-FM-VAL-22		Line Valve Assembly, el. = 170.194				1	ea	2006		40	28	\$5,000	\$5,000						1	2	5					
5	805	1112 Fitzgerald Rd		Shawanigan lake rd 2-230 to 2-250	1483	S	FM	VAL	23	S-FM-VAL-23		Line Valve Assembly, el. = 134.431 (pipe change)				1	ea	2006		40	28	\$5,000	\$5,000						1	2	5					
6	805	1112 Fitzgerald Rd		Sooke lake rd 2-160 to 2-810	1483	S	FM	PP	25	S-FM-PP-25		Forcemain pipe, 150mm, min 1.2m depth		DR 11	HDPE	650	m	2006		80	68	\$500	\$325,000						1	3	4	Assess/inspect forcemains and air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
6	805	1112 Fitzgerald Rd		Sooke lake rd 2-810 to 3-741	1483	S	FM	PP	25	S-FM-PP-25		Forcemain pipe, 150mm, min 1.2m depth		DR 17	HDPE	931	m	2006		80	68	\$500	\$465,500						1	3	4	Assess/inspect forcemains and air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
6	805	1112 Fitzgerald Rd		Sooke lake rd 2-837	1483	S	FM	VAL	26	S-FM-VAL-26		Blow down / flush valve assembly, El. = 122.492 (low point)				1	ea	2006		40	28	\$5,000	\$5,000						1	2	5					
6	805	1112 Fitzgerald Rd		Sooke lake rd 2-830	1483	S	FM	VAL	27	S-FM-VAL-27		Line valve assembly, el. = 135.313 (pipe change)				1	ea	2006		40	28	\$5,000	\$5,000						1	2	5					
6	805	1112 Fitzgerald Rd		Sooke lake rd 2-850	1483	S	FM	VAL	28	S-FM-VAL-28		Air vacuum valve model, el. = 137.498		100L.5		1	ea	2006		40	28	\$5,000	\$5,000						2	2	4	Assess/inspect air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
6	805	1112 Fitzgerald Rd		Sooke lake rd 2-900	1483	S	FM	VAL	29	S-FM-VAL-29		Air vacuum valve model, el. = 145.563		100L.5		1	ea	2006		40	28	\$5,000	\$5,000						2	2	4	Assess/inspect air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
6	805	1112 Fitzgerald Rd		Sooke lake rd 2-945	1483	S	FM	VAL	30	S-FM-VAL-30		Air release/Vacuum and Line Valve assembly		10L.5		1	ea	2006		40	28	\$5,000	\$5,000						2	2	4	Assess/inspect air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
6	805	1112 Fitzgerald Rd		Sooke lake rd 2-985	1483	S	FM	VAL	31	S-FM-VAL-31		Air release valve, el. = 176.103		201 C.2		1	ea	2006		40	28	\$5,000	\$5,000						2	2	4	Assess/inspect air release valve chambers for deterioration to determine replacement timing/phasing.	Operations	Included above	5-10 Year	
6	805	1112 Fitzgerald Rd		Sooke lake rd 3-741	1483	S	FM	VAL	32	S-FM-VAL-32		Line valve assembly, el. = 158.302				1	ea	2006		40	28	\$5,000	\$5,000						1	2	5					
7	805	1112 Fitzgerald Rd		Fitzgerald rd SMH E to SCD A	197	S	SS	S	80	S-SS-S-80		Sewermain pipe, 150mm			PVC	35	m	2010		80	72	\$500	\$17,500						1	2	5					
7	805	1112 Fitzgerald Rd		Fitzgerald rd	197	S	SS	SV	81	S-SS-SV-81		Service lines (approx. 4m per line)				10	ea	2010		80	72	\$3,000	\$30,000						1	2	5					
7	805	1112 Fitzgerald Rd		Fitzgerald rd	197	S	SS	MH	78	S-SS-MH-78		Service lines (approx. 4m per line)				1	ea	2010		40	32	\$8,000	\$8,000						1	2	5					
7	805	1112 Fitzgerald Rd		Fitzgerald rd	197	S	SS	CO	79	S-SS-CO-79		SCA A				1	ea	2010		40	32	\$2,000	\$2,000						1	2	5					
8	805	1112 Fitzgerald Rd		Skyilar Cir. Ex. SMH to SMH A	197	S	SS	S	102	S-SS-S-102		200mm Sewermain, 2.5m depth				10	m	2011		80	73	\$550	\$5,500						1	2	5					
8	805	1112 Fitzgerald Rd		Skyilar Cir. SMH A to SMH B	197	S	SS	S	103	S-SS-S-103		200mm Sewermain, 2.5m depth				17	m	2011		80	73	\$550	\$9,350						1	2	5					
8	805	1112 Fitzgerald Rd		Skyilar Cir. SMH B to SMH C	197	S	SS	S	104	S-SS-S-104		200mm Sewermain, 2.5m depth				16	m	2011		80	73	\$550	\$8,800						1	2	5					
8	805	1112 Fitzgerald Rd		Skyilar Cir. SMH C to SMH D	197	S	SS	S	105	S-SS-S-105		200mm Sewermain, 2.5m depth				12	m	2011		80	73	\$550	\$6,600						1	2	5					
8	805	1112 Fitzgerald Rd		Skyilar Cir. SMH D to SMH E	197	S	SS	S	106	S-SS-S-106		200mm Sewermain, 2.5m depth				123	m	2011		80	73	\$550	\$67,650						1	2	5					
8	805	1112 Fitzgerald Rd		Skyilar Cir. SMH E to SMH F1	197	S	SS	S	107	S-SS-S-107		200mm Sewermain, 2.																								

805 Arbutus Mtn Estates Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



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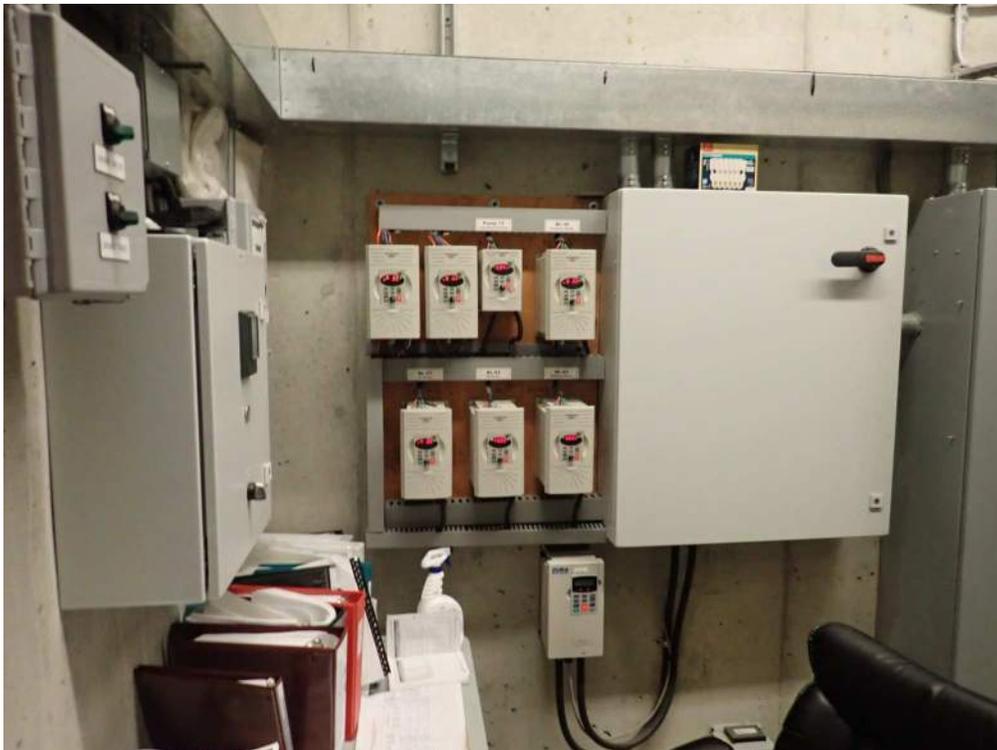


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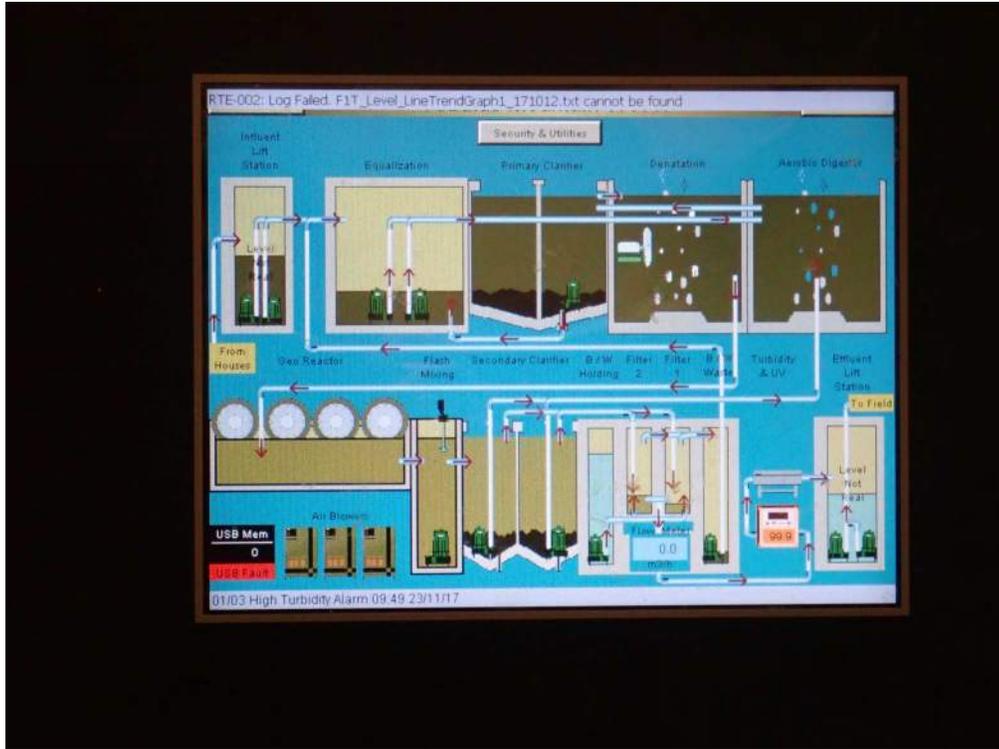


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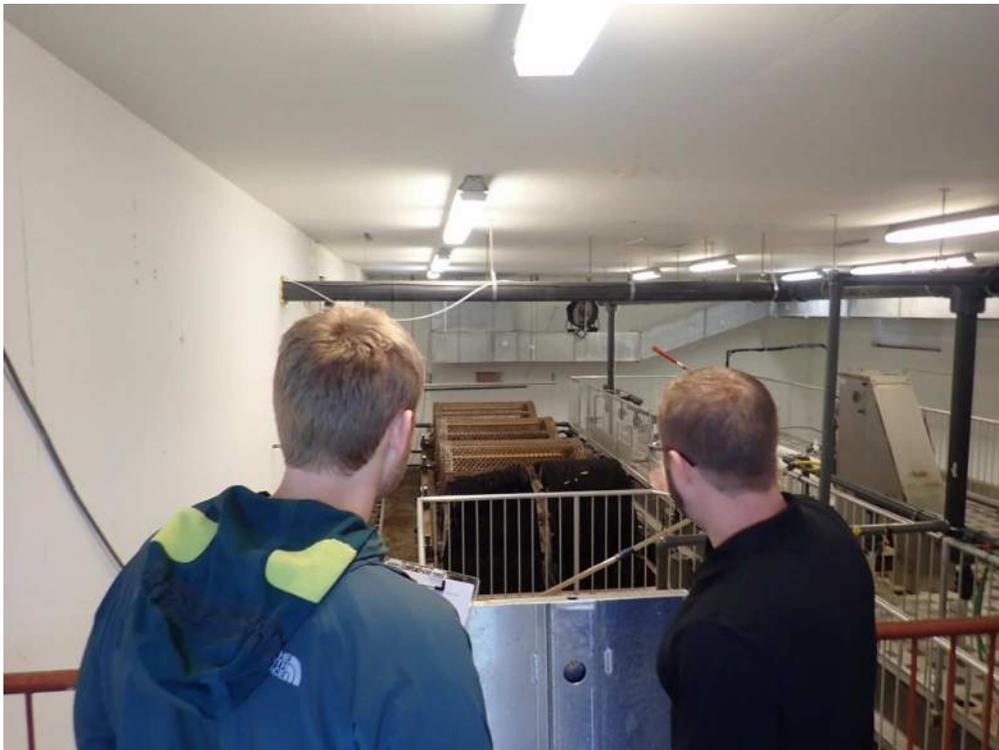


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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Arbutus Mountain Heights - Sewage Treatment Building - Functional Code 805**

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			If recommended work not complete can the rate of deterioration be expected to increase?		Will a failure in this system lead to a loss of use of the facility?		Can the current condition adversely affect the building's security of safety?		OPINION OF PROBABLE COST						
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Yr to Next U/R Check or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	Can this work be completed in the next 12 months?	Can this work be completed in the next 24 months?	Can this work be completed in the next 36 months?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1 & 2	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2008	21-Nov-17	MH	10	50	40	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	3500	\$20	SF	\$70,000	0%	10%	5%	\$81,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1 & 2	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2008	21-Nov-17	MH	10	50	40	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	3500	\$10	SF	\$35,000	0%	10%	5%	\$41,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1 & 2	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2008	21-Nov-17	MH	10	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1 & 2	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2008	21-Nov-17	MH	10	50	40	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1 & 2	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2008	21-Nov-17	MH	10	50	40	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	220	\$40	SF	\$8,800	0%	10%	5%	\$11,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1 & 2	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2008	21-Nov-17	MH	10	12	2	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	3200	\$2	SF	\$6,400	0%	15%	5%	\$8,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1 & 2	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2008	21-Nov-17	MH	10	50	40	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	3200	\$35	SF	\$112,000	0%	5%	5%	\$124,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1 & 2	Perforated metal soffit is present at the roof overhangs.	5	5	2008	21-Nov-17	MH	10	50	40	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	300	\$15	SF	\$4,500	0%	10%	5%	\$6,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201005 Exterior Louvers and Screens	Exterior Walls/Vent Louver	1 & 2	A metal louver vent is present on the exterior wall.	5	5	2008	21-Nov-17	MH	10	30	20	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	EA	\$200	0%	10%	5%	\$1,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	B20 Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/ Door	1 & 2	Vinyl windows are present throughout the building.	5	5	2008	21-Nov-17	MH	10	25	15	Replace vinyl windows at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	5	\$250	EA	\$1,250	0%	5%	5%	\$2,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1 & 2	Four painted metal doors (three single and one double) are present on the building.	5	5	2008	21-Nov-17	MH	10	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	4	\$1,500	EA	\$6,000	0%	5%	5%	\$7,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1 & 2	The is a sloped assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2008	21-Nov-17	MH	10	25	15	Replace the roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	4000	\$5	SF	\$20,000	0%	5%	5%	\$23,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1 & 2	The is a sloped assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2008	21-Nov-17	MH	10	25	18	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	240	\$10	SF	\$2,400	0%	10%	5%	\$3,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	3	The interior gypsum and plywood walls and ceilings are painted.	5	5	2008	21-Nov-17	MH	10	20	10	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Arbutus Mountain Heights - Sewage Treatment Building	Sewage Treatment Building	805	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2008	21-Nov-17	MH	10	20	10	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Arbutus Mountain Heights - Sewage Treatment Building - Functional Code 805



Photo 1



Photo 2

Cowichan Valley Regional District

Arbutus Mountain Heights - Sewage Treatment Building - Functional Code 805



Photo 3



## 809 - Cobble Hill Sewer

Infrastructure Condition Assessment and Capital Plan  
1532 Gallier Rd, Cobble Hill, BC

Date Prepared July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 2, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 3, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 809 - Cobble Hill Sewer

Infrastructure Condition Assessment and Capital Plan  
1532 Gallier Rd, Cobble Hill, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4	1 and 2	ALL	Capital Upgrade/New	Secure funding to connect STP to Twin Cedar System. Decommission existing STP once connected to Twin Cedar System.	\$400,000	\$400,000
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$400,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	3 to 9	ALL	Operations	Assess/Inspect sewer mains, manholes, and cleanouts for deterioration to determine replacement timing/phasing.	\$15,000	\$15,000
	14						
	15						
	16						
	17						
						Total	\$15,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**SEWAGE TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Cobble Hill Sewer DATE: Nov. 22/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 809 PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic)

2) Site Conditions/Security

3) Condition of Structure:

809 (1)



809 (2)  
1 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (3)



809 (4)  
2 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (5)



809 (6)  
3 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (7)



809 (8)  
4 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (9)



809 (10)  
5 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (11)



809 (12)  
6 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (13)

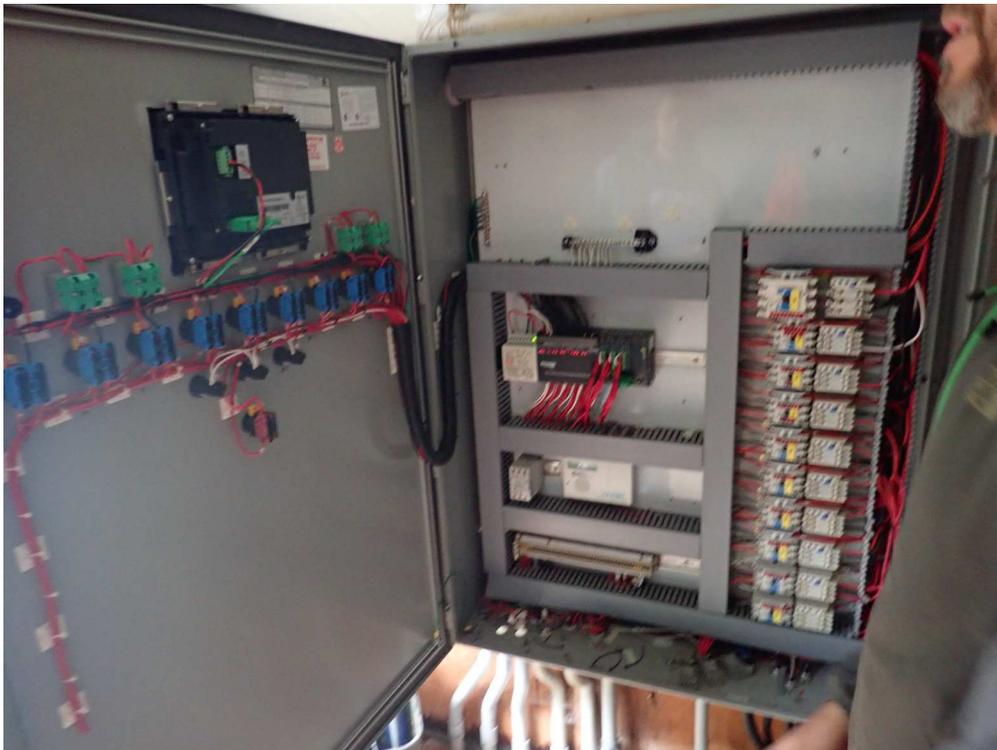


809 (14)  
7 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (15)



809 (16)  
8 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (17)



809 (18)  
9 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (19)



809 (20)  
10 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (21)



809 (22)  
11 of 12

809 Cobble Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



809 (23)

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Coble Hill - Sewage Treatment Plant - Functional Code 809

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Coble Hill - Sewage Treatment Plant	Sewage Treatment Plant	809	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2008	21-Nov-17	MH	10	50	43	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	200	\$20	SF	\$4,000	0%	5%	5%	\$5,000
Coble Hill - Sewage Treatment Plant	Sewage Treatment Plant	809	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2011	21-Nov-17	MH	7	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected. Isolated areas of plywood are present at grade.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	200	\$10	SF	\$2,000	0%	5%	5%	\$3,000
Coble Hill - Sewage Treatment Plant	Sewage Treatment Plant	809	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is manufactured panel system, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2011	21-Nov-17	MH	7	30	23	The manufactured structural components are expected to last the life of the building. Replace the walls and roof at the end of their service life.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	200	\$120	SF	\$24,000	0%	5%	5%	\$27,000
Coble Hill - Sewage Treatment Plant	Sewage Treatment Plant	809	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Metal Panel	1	The superstructure is manufactured panel system. Water ingress issues were noted.	4	4	2011	21-Nov-17	MH	7	10	1	Reseal cladding joints and review flashing detailing.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	15%	5%	\$2,000
Coble Hill - Sewage Treatment Plant	Sewage Treatment Plant	809	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Metal Panel	1	The superstructure is manufactured panel system. Water ingress issues were noted.	5	5	2011	21-Nov-17	MH	7	30	23	Replace structure at the end of its service life. The cost of this item has been included in Item 3 Superstructure.	Replacement	3 - Future Renewal	Yes	Yes	No	No								
Coble Hill - Sewage Treatment Plant	Sewage Treatment Plant	809	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A double metal door is present on the building.	5	5	2011	21-Nov-17	MH	7	30	23	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Coble Hill - Sewage Treatment Plant	Sewage Treatment Plant	809	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The superstructure is manufactured panel system. Water ingress issues were noted.	5	5	2011	21-Nov-17	MH	7	10	1	Reseal cladding joints and review flashing detailing.	Replacement	3 - Future Renewal	No	Yes	No	No	1	\$1,500	LS	\$1,500	0%	5%	5%	\$2,000
Coble Hill - Sewage Treatment Plant	Sewage Treatment Plant	809	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2011	21-Nov-17	MH	7	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Arbutus Mountain Heights - Sewage Treatment Building - Functional Code 805



Photo 1



Photo 2



## 810 - Mesachie Lake Sewer

Infrastructure Condition Assessment and Capital Plan

6740 Forestry Road, Mesachie Lake, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 7, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 12, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 810 - Mesachie Lake Sewer

Infrastructure Condition Assessment and Capital Plan

6740 Forestry Road, Mesachie Lake, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan - DRAFT

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4	1 to 7	ALL	Capital Upgrade/New	Install new collection and treatment system (STEP system).	\$1,700,000	\$1,700,000
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$1,700,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13						\$0
	14						
	15						
	16						
	17						
						Total	\$0

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Crowsnest Valley Regional District (CVRD)
System:	Moosehide Lake Sewer
Civic Address:	6740 Forestry Rd
Geographic Location:	East of Bear Lake
Customer:	Parcels: 49
Units:	49

Infrastructure Condition Assessment

Current Year:	2018	Total Replacement Value	\$3,052,998
		Value per user:	\$61,886

Asset ID	LOCATION				Asset Code		Photo	Description	Make	Model	Asset Inventory		Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Condition Assessment					Recommendations / Action Items	Type of Work	10 Year Capital Plan		Comment/Question to be resolved		
	Function Code	Address	Location	DWG Ref	Major	Minor					Spec	ID					Asset Code	Quantity	Quantity used	Year Installed	Year Renewed			Physical Condition	Level of Service Condition		Degraded Condition	Probability of Failure
1	B10	6740 Forestry Rd	Sewage treatment plant	Site Visit / Photos	S	STP	ET	1	S-STP-ET-1	2 to 8			1977	40	0	\$400,000	\$800,000	Poor - no controls/communications, limited grade of system	Does not meet standard	Meeting Class D effluents, no permits	4	3	2	Install new collection and treatment system (STEP system)	Capital Upgrade/New	\$5,700,000	1-2 Year	
2	B10	6740 Forestry Rd	Sewage treatment plant	Site Visit / Photos	S	STP	DF	2	S-STP-DF-2	2 to 8			1977	40	0	\$250,000	\$500,000	Poor	Does not meet standard	Meeting Class D effluents, no permits	4	3	2	Install new collection and treatment system (STEP system)	Capital Upgrade/New	Included above	1-2 Year	
3	B10	6740 Forestry Rd	SEWER MAIN	BEAR LAKE ROAD	S	SS	S	3	S-SS-S-3				1945	80	7	\$500	\$79,000				4	3	2	Install new collection and treatment system (STEP system)	Capital Upgrade/New	Included above	1-2 Year	
4	B10	6740 Forestry Rd	SEWER MAIN	BEAR LAKE ROAD	S	SS	S	4	S-SS-S-4				1945	80	7	\$500	\$109,804				4	3	2	Install new collection and treatment system (STEP system)	Capital Upgrade/New	Included above	1-2 Year	
5	B10	6740 Forestry Rd	SEWER MAIN	FISH ROAD	S	SS	S	5	S-SS-S-5				1945	80	7	\$500	\$4,300				4	3	2	Install new collection and treatment system (STEP system)	Capital Upgrade/New	Included above	1-2 Year	
6	B10	6740 Forestry Rd	SEWER MAIN	FORESTRY ROAD	S	SS	S	6	S-SS-S-6				1945	80	7	\$500	\$113,194				4	3	2	Install new collection and treatment system (STEP system)	Capital Upgrade/New	Included above	1-2 Year	
6	B10	6740 Forestry Rd	SEWER MAIN	FORESTRY ROAD	S	SS	S	7	S-SS-S-7				1945	80	7	\$500	\$7,500				4	3	2	Install new collection and treatment system (STEP system)	Capital Upgrade/New	Included above	1-2 Year	
7	B10	6740 Forestry Rd	SEWER MANHOLE		S	SS	NH	8	S-SS-NH-8				1945	40	0	\$8,000	\$48,000				4	3	2	Install new collection and treatment system (STEP system)	Capital Upgrade/New	Included above	1-2 Year	

810 Mesachie Lake Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**SEWAGE TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Mesachie Lake Sewer DATE: Nov. 21/17

LOCATION: \_\_\_\_\_ PROJECT No.: 5170700

SYSTEM CODE: 810 CVRD STAFF PRESENT: \_\_\_\_\_

INSPECTED BY: \_\_\_\_\_

1) Type of Treatment System (Schematic)  
- septic tank & disposal field → takes half of flow from water system.

2) Site Conditions/Security

3) Condition of Structure:

810 (1)



810 (2)  
1 of 4

810 Mesachie Lake Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



810 (3)



810 (4)  
2 of 4

810 Mesachie Lake Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



810 (5)



810 (6)  
3 of 4

810 Mesachie Lake Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



810 (7)



810 (8)  
4 of 4



## 811 - Bald Mountain Sewer

Infrastructure Condition Assessment and Capital Plan

9455 Marble Bay Rd, Honeymoon Bay, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 8, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 4, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 811 - Bald Mountain Sewer

Infrastructure Condition Assessment and Capital Plan

9455 Marble Bay Rd, Honeymoon Bay, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$0

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-STP-FTR-6	Operations	Assess/inspect filter membranes for deterioration to determine replacement timing/phasing. Replace membrane filters when they reach the end of their design life.	\$5,000	\$15,000
	8	2	ALL	Operations	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.	\$10,000	
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	1	ALL	Operations	Assess/inspect wastewater treatment plant for deterioration to determine replacement timing/phasing.	\$15,000	\$35,000
	14	3, 4, 5 and 13	ALL	Operations	Assess/inspect forcemains for deterioration to determine replacement timing/phasing.	\$20,000	
	15						
	16						
	17						
						Total	\$50,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	Bald Mountain Sewer
Location:	9455 Marble Bay rd
Geographic Location:	East side of Cowichan Lake
Customer:	Parcel: 132
Users:	53

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$3,686,112
		Value per user	\$69,532

Asset ID	Function Code	Location	Address	Location	DWG Ref	Major	Minor	Asset Code	Asset Code	Photo	Description	Make	Model	Asset Inventory		Year Installed	Year Replaced	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Condition Assessment			Recommendations / Action Items	Description	Type of Work	10 Year Capital Plan		Timing	Comment/Question to be resolved		
														Quantity	Unit									Probability of Failure	Severity of Failure	Condition				Budget Estimate	Value				
1	R11	9455 Marble Bay rd		Woodland shores WWTP	30701-3	S	STP	STP	1	5-STP-STP-1	5 to 16, MOV, L, MOV 2			1	ea	2010		40	32	Refer to Bald Mountain Sewer System Building Condition Assessment.	\$150,000	Good - fenced and gated	Meets standard	2	2	4	able to meet capacity, designed for full build-out		Operations						
1	R11	9455 Marble Bay rd		Woodland shores WWTP	30701-3	S	STP	ET	2	5-STP-ET-2	5 to 7			3	ea	2010		40	32	\$100,000	\$300,000	Good	Meets standard	2	2	4	Assess/inspect wastewater treatment plant for deterioration to determine replacement timing/phasing.		Operations	\$15,000	\$10 Year	5-10 Year			
1	R11	9455 Marble Bay rd		Woodland shores WWTP	30701-3	S	STP	ET	5	5-STP-ET-5	5 to 7			1	ea	2010		40	32	\$100,000	\$100,000	Good	Meets standard	2	2	4	Assess/inspect wastewater treatment plant for deterioration to determine replacement timing/phasing.		Operations	Included above	5-10 Year				
1	R11	9455 Marble Bay rd		Woodland shores WWTP	30701-3	S	STP	FTR	6	5-STP-FTR-6	14			1	ea	2010		20	12	\$150,000	\$150,000	Good	Meets standard	3	2	3	Assess/inspect filter membranes for deterioration to determine replacement timing/phasing. Replace membrane filters when they reach the end of their design life.		Operations	\$5,000	2-5 Year				
1	R11	9455 Marble Bay rd		Woodland shores WWTP	30701-3	S	STP	ET	7	5-STP-ET-7				2	ea	2010		40	32	\$100,000	\$200,000	Good	Meets standard	2	2	4	Assess/inspect wastewater treatment plant for deterioration to determine replacement timing/phasing.		Operations	Included above	5-10 Year				
1	R11	9455 Marble Bay rd		Woodland shores WWTP	Site Visit / Photos	S	STP	PP	9	5-STP-PP-9	5 to 9, 14, 15			1	LS	2010		10	2	\$100,000	\$100,000	Good	Meets standard	2	2	4	Assess/inspect wastewater treatment plant for deterioration to determine replacement timing/phasing.		Operations	Included above	5-10 Year				
1	R11	9455 Marble Bay rd		Woodland shores WWTP	Site Visit / Photos	S	STP	COM	10	5-STP-COM-10	10 to 12			1	LS	2010		10	2	\$20,000	\$20,000	Good - intrusion alarm	Meets standard	2	2	4	Assess/inspect wastewater treatment plant for deterioration to determine replacement timing/phasing.		Operations	Included above	5-10 Year				
1	R11	9455 Marble Bay rd		Woodland shores WWTP	Site Visit / Photos	S	STP	GEN	11	5-STP-GEN-11	17			1	ea	2010		40	32	\$100,000	\$100,000	Good	Meets standard	2	2	4	Assess/inspect wastewater treatment plant for deterioration to determine replacement timing/phasing.		Operations	Included above	5-10 Year				
2	R11	9455 Marble Bay rd		Lift station	1049-C-P51	S	LS	BD	12	S-LS-BD-12	1 to 4			1	ea	2008		40	30	\$250,000	\$250,000	Good - no fence	Meets standard	2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.		Operations	\$10,000	2-5 Year				
2	R11	9455 Marble Bay rd		Lift station	1049-C-P51	S	LS	VC	13	S-LS-VC-13	2			1	LS	2008		40	30	\$100,000	\$100,000	Good	Meets standard	2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.		Operations	Included above	2-5 Year				
2	R11	9455 Marble Bay rd		Lift station	1049-C-P51	S	LS	PMP	14	S-LS-PMP-14	2		Flugt	NP-3102	2	ea	2008		20	10	\$7,000	\$14,000	Good	Meets standard	2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.		Operations	Included above	2-5 Year			
2	R11	9455 Marble Bay rd		Lift station	Site Visit / Photos	S	LS	COM	16	S-LS-COM-16	3, 4			1	LS	2008		10	0	\$9,000	\$9,000	Good	Meets standard	2	3	3	Inspect/assess lift stations for deterioration to determine replacement timing/phasing.		Operations	Included above	2-5 Year				
3	R11	9455 Marble Bay rd		Near lift station	1049-C-P51	S	FMA	PP	17	S-FMA-PP-17				13	m	2008		80	70	\$425	\$5,525			1	3	4	Assess/inspect forcemains for deterioration to determine replacement timing/phasing.		Operations	\$20,000	3-10 Year				
3	R11	9455 Marble Bay rd		Near lift station	1049-C-P51	S	FMA	PP	18	S-FMA-PP-18				1	m	2008		80	70	\$450	\$450			1	3	4	Assess/inspect forcemains for deterioration to determine replacement timing/phasing.		Operations	Included above	3-10 Year				
4	R11	9455 Marble Bay rd		Marble Bay rd. D=480 - D=715	1049-D1	S	FMA	PP	19	S-FMA-PP-19		CL150 C900	DR18	PVC	235	m	2009		80	71	\$450	\$105,750			1	3	4	Assess/inspect forcemains for deterioration to determine replacement timing/phasing.		Operations	Included above	3-10 Year			
4	R11	9455 Marble Bay rd		Marble Bay rd. D=940 - 1+130	1049-D1	S	FMA	PP	20	S-FMA-PP-20		CL150 C900	PVC	725	m	2009		80	71	\$500	\$365,500			1	3	4	Assess/inspect forcemains for deterioration to determine replacement timing/phasing.		Operations	Included above	3-10 Year				
5	R11	9455 Marble Bay rd		Cabana pl 15 - Marble Bay rd (1+109 - 1+130)	12-212	S	FMA	PP	21	S-FMA-PP-21			SDR26	PVC	107	m	2014		80	76	\$425	\$45,637			1	3	4	Assess/inspect forcemains for deterioration to determine replacement timing/phasing.		Operations	Included above	3-10 Year			
6	R11	9455 Marble Bay rd		Lakefront Dr. D=199-12	1049-D1	S	SM	MH	22	S-SM-MH-22				1	ea	2009		40	31	\$8,000	\$8,000			1	2	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. D=155-10	1049-D1	S	SM	MH	23	S-SM-MH-23				1	ea	2009		40	31	\$8,000	\$8,000			1	2	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. D=157-10	1049-D1	S	SM	MH	24	S-SM-MH-24				1	ea	2009		40	31	\$8,000	\$8,000			1	2	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. D=157-72	1049-D1	S	SM	MH	25	S-SM-MH-25				1	ea	2009		40	31	\$8,000	\$8,000			1	2	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. D=157-94	1049-D1	S	SM	MH	26	S-SM-MH-26				1	ea	2009		40	31	\$8,000	\$8,000			1	2	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. D=155	1049-D1	S	SM	MH	27	S-SM-MH-27				1	ea	2009		40	31	\$8,000	\$8,000			1	2	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 10 - SMH 10	1049-D1	S	SM	S	33	S-SM-S-33				41	m	2009		80	71	\$550	\$22,457			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 10 - SMH 9	1049-D1	S	SM	S	34	S-SM-S-34				40	m	2009		80	71	\$550	\$22,000			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 9 - SMH 8	1049-D1	S	SM	S	35	S-SM-S-35				40	m	2009		80	71	\$550	\$22,000			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 8 - SMH 7	1049-D1	S	SM	S	36	S-SM-S-36				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 7 - SMH 6	1049-D1	S	SM	S	37	S-SM-S-37				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 6 - SMH 5	1049-D1	S	SM	S	38	S-SM-S-38				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 5 - SMH 4	1049-D1	S	SM	S	39	S-SM-S-39				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 4 - SMH 3	1049-D1	S	SM	S	40	S-SM-S-40				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 3 - SMH 2	1049-D1	S	SM	S	41	S-SM-S-41				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 2 - SMH 1	1049-D1	S	SM	S	42	S-SM-S-42				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. SMH 1 - (D=480)	1049-D1	S	SM	S	43	S-SM-S-43				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. (D=480)	1049-D1	S	SM	S	44	S-SM-S-44				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. (D=480)	1049-D1	S	SM	S	45	S-SM-S-45				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. (D=480)	1049-D1	S	SM	S	46	S-SM-S-46				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. (D=480)	1049-D1	S	SM	S	47	S-SM-S-47				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. (D=480)	1049-D1	S	SM	S	48	S-SM-S-48				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. (D=480)	1049-D1	S	SM	S	49	S-SM-S-49				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. (D=480)	1049-D1	S	SM	S	50	S-SM-S-50				40	m	2009		80	71	\$550	\$22,174			1	1	3									
6	R11	9455 Marble Bay rd		Lakefront Dr. (D=480)	1049-D1	S	SM	S	51	S-SM-S-51																									

811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



811 (1)



811 (2)  
1 of 9

811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



811 (3)



811 (4)  
2 of 9

811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



811 (5)



811 (6)  
3 of 9

811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



811 (7)



811 (8)  
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811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



811 (9)



811 (10)  
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811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



811 (11)



811 (12)

811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



811 (13)



811 (14)  
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811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



811 (15)



811 (16)  
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**811 Bald Mountain Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's**



**811 (17)**

## 813 - Mill Springs Sewer

### Infrastructure Condition Assessment and Capital Plan

927 Deloume Rd, Mill Bay, BC

Date Prepared

July 18, 2018

#### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$8,227,184	
Number of Users	210	
Replacement Cost Per User	\$39,177	
Annual Replacement Cost (40 Years)	\$77,668	per year
Annual Replacement Cost (80 Years)	\$101,570	per year
10 Year Capital Plan Total	\$0	
10 Year Operations and Maintenance Plan Total	\$85,000	

#### PROPERTY DESCRIPTION

The Mill Springs Sewer System was construction in 1997 and includes the phases outlined in the table below.

Development	Year Installed	Source
Phase 1A - Frayne Rd, Deloume Rd	1997	Record Drawing (C438 001 02 02)
Phase 2 - Gatewheel Rd	2004	Record Drawing (F235-001-00)
Phase 5 - Boompond Rd	2006	Record Drawing (F235-005-00)
Phase 6 - Bucktail Rd, Glendoik Rd	2006	Record Drawing (F235-006-00)
Phase 8 - Bucktail Rd, Deloume Rd	2008	Record Drawing (F235-008-00)
Phase 9 - Gillespie Place	2008	Record Drawing (F235-010-01)
Phase 10 - McClaren Rd, Tutor Way, Pratt Rd	2010	Record Drawing (F235-010-02)
Phase 11 - Tutor Way	2011	Record Drawing (60147531)
Phase 13/14 - Pratt Rd, Faulkner Pl, Marie Rd	2015	Record Drawing (60301901)
Phase 15 - Blairgowrie Rd	2016	Record Drawing (60484147)
Sewage Treatment Plant Upgrade	2015	Record Drawing (13198)

#### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
 Todd Etherington, Utility Operations Superintendent  
 David Parker, Engineering Technologist III  
 Rob Grant, GIS Supervisor  
 Andrea Kross, GIS Technician I  
 Adam Greenwood, Project Engineer  
 Kieran Bertsch, E.I.T.  
 Caleb Light, GIS

#### CONTACT INFORMATION

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## 813 - Mill Springs Sewer

Infrastructure Condition Assessment and Capital Plan

927 Deloume Rd, Mill Bay, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 8, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 4, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 813 - Mill Springs Sewer

Infrastructure Condition Assessment and Capital Plan  
927 Deloume Rd, Mill Bay, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$0

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	1	ALL	Operations	Inspect/assess STP for deterioration to determine replacement timing/phasing.	\$30,000	\$85,000
	14	2	ALL	Operations	Inspect/assess disposal field for deterioration to determine replacement timing/phasing.	\$15,000	
	15	4, 6, 9 and 10	As Noted	Operations	Assess/Inspect older sections of Mill Spring collection system for sources of I&I to determine rehabilitation/replacement timing/phasing.	\$30,000	
	16	6	S-FM-PP-86 and S-FM-PP-92	Operations	Assess/Inspect forcemains for deterioration to determine replacement timing/phasing.	\$10,000	
	17						
						Total	\$85,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	813 Mill Springs Sewer
Location:	927 Debelme rd
Geographic Location:	South of Mill Bay
Customer:	239
Users:	230

Infrastructure Condition Assessment

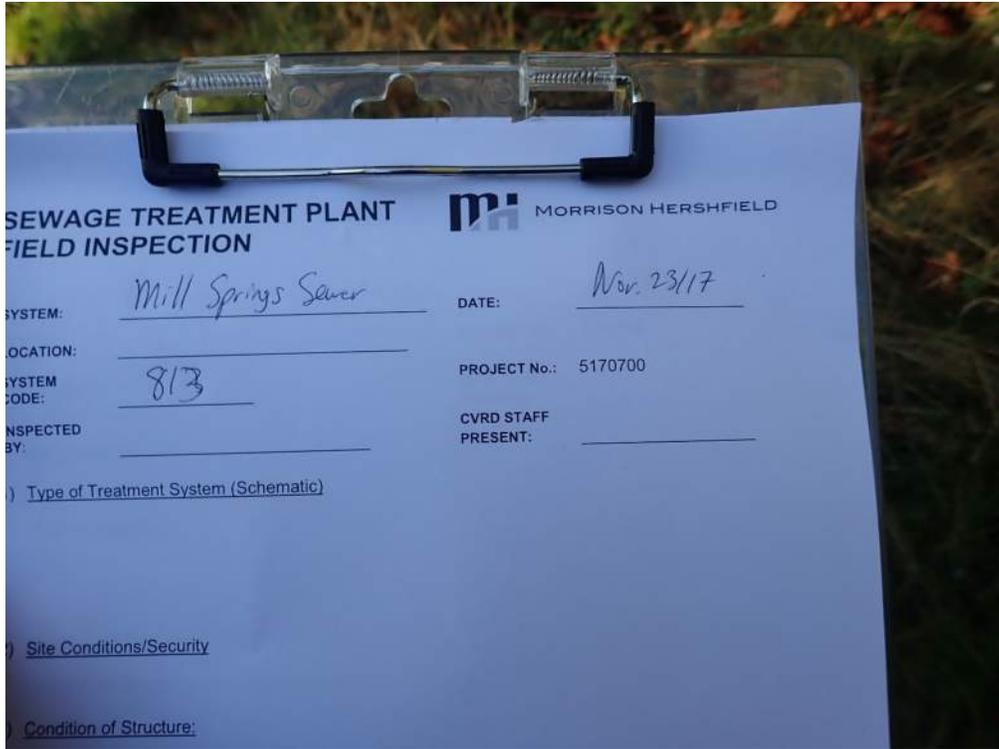
Current Year:	2018	Total Replacement Value:	\$8,277,184
		Value per user:	\$33,377

Asset ID	Function Code	Location	Address	Location	DWS Ref	Major	Spec	Asset ID	Asset Code	Photo	Description	Make	Model	Material	Quantity	Asset Inventory	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Condition Assessment			Recommendations / Action Items	Type of Work	Est. Total Capital Plan Budget Estimate	Timing	Comment/Question to be resolved
																									Demand Condition	Probability of Failure	Severity of Failure					
1	813	927 Debelme rd		Sewage treatment plant	13198	S	STP	1	S-STP-STP-1	2 to 70 MWV 1, MWV 2	Influent screen, 15 L/s, 6mm screen openings	Huber Rotamat	RaM	Stainless steel	1	ea	2015		40	37	\$100,000	\$100,000	Fair - fenced and graded, odour roof	Meets standard	2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	\$30,000	5-10 Year	Refer to Mill Springs Sewer System Building Condition Assessment
1	813	927 Debelme rd		Sewage treatment plant	13198	S	ET	3	S-STP-ET-3	See notes: need to update photo numbers for	Equalization tank		Concrete	1	ea	2015		40	37	\$100,000	\$100,000	Good		2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	4	S-STP-PMP-4		Influent pump, submersible grinder, 1.5L/s @ 10m TDH	Barnes	SOV 2052 L	Cast iron	2	ea	2015		20	17	\$5,000	\$10,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	6	S-STP-PMP-6		Influent pump, submersible grinder, 2.5L/s @ 10m TDH (new install)	Barnes	SOV 2052 L	Cast iron	2	ea	2015		20	17	\$5,000	\$10,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	8	S-STP-PMP-8		Influent pump, submersible grinder, 4.0L/s @ 10m TDH	Barnes	SOV 3052 L	Cast iron	2	ea	2015		20	17	\$5,000	\$10,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	ET	10	S-STP-ET-10		Emergency storage tank, 248 m3		Concrete	1	ea	2015		40	37	\$150,000	\$150,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	ET	11	S-STP-ET-11		Emergency storage tank, 180 m3		Concrete	1	ea	2015		40	37	\$120,000	\$120,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	12	S-STP-PMP-12		Emergency storage pump, 3.8L/s @ 7.5m TDH	Myers	WHRS-11	Cast iron	1	ea	2015		20	17	\$5,000	\$5,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	FTR	13	S-STP-FTR-13		Bioreactor, 60 m3/day	Ecofluid	Concrete	1	ea	2015		20	17	\$100,000	\$100,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	FTR	14	S-STP-FTR-14		Bioreactor, 60 m3/day	Ecofluid	USBF	Polypropylene	1	ea	2015		20	17	\$100,000	\$100,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	AM	15	S-STP-AM-15		Anoxic mixer	KSB	C220/4JMG	Stainless steel/cast iron	1	ea	2015		20	17	\$30,000	\$30,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	COA	16	S-STP-COA-16		Sludge pre-thickener	Ecofluid	PVC		1	ea	2015		40	37	\$20,000	\$20,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	17	S-STP-PMP-17		Pre-thickener pump, submersible grinder, 4.2L/s @ 7m TDH	Myers	WGL20F	Cast iron	1	ea	2015		20	17	\$5,000	\$5,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	CC	18	S-STP-CC-18		Flow splitter box	Ecofluid	Epoxy coated steel	1	ea	2015		40	37	\$50,000	\$50,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	FTR	19	S-STP-FTR-19		Bioreactor	Ecofluid	USBF	Concrete	1	ea	2015		20	17	\$100,000	\$100,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	AM	20	S-STP-AM-20		Anoxic mixer	KSB	C220/4JMG	Cast iron body/SS propeller	1	ea	2015		20	17	\$30,000	\$30,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	AM	21	S-STP-AM-21		Anoxic mixer, submersible	ABS	RW2022-516/4 EC	Cast iron body/SS propeller	1	ea	2015		20	17	\$30,000	\$30,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	COA	22	S-STP-COA-22		Sludge pre-thickener	Ecofluid	PVC		1	ea	2015		40	37	\$20,000	\$20,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	23	S-STP-PMP-23		Sludge pre-thickener pump, submersible grinder	Myers	WGL 30	Cast iron	1	ea	2015		20	17	\$5,000	\$5,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	24	S-STP-PMP-24		Anoxic recirculation submersible pump	Zeebler	N151	Cast iron	1	ea	2015		20	17	\$5,000	\$5,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	COA	25	S-STP-COA-25		Sludge pre-thickener, 1m3/day @ 1.5% DS	Ecofluid	PVC		2	ea	2015		40	37	\$5,000	\$10,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	27	S-STP-PMP-27		Sludge pre-thickener pump, submersible grinder	Myers	WGL20F	Cast iron	2	ea	2015		20	17	\$5,000	\$10,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	FTR	29	S-STP-FTR-29		Bioreactor, 70 m3/day (batch)	Ecofluid	USBF	Concrete, Polypropylene/Steel	2	ea	2015		20	17	\$100,000	\$200,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	AM	31	S-STP-AM-31		Anoxic mixer, submersible	ABS	RW2022-516/4 EC	Cast iron body/SS propeller	4	ea	2015		20	17	\$30,000	\$120,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	CC	35	S-STP-CC-35		Flow splitter box	Ecofluid	Epoxy coated steel	1	ea	2015		40	37	\$50,000	\$50,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	36	S-STP-PMP-36		Anoxic recirculation submersible pump	Zeebler	N151	Cast iron	2	ea	2015		20	17	\$5,000	\$10,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	FTR	38	S-STP-FTR-38		Microfilter, 15L/s	Fontana	MF-40	Stainless steel	1	ea	2015		20	17	\$100,000	\$100,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	39	S-STP-PMP-39		MF backwash pump, 3.2L/s @ 9.5m TDH	Prosser	9-01311-28FK	Stainless steel	1	ea	2015		20	17	\$5,000	\$5,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	ET	40	S-STP-ET-40		Filter feed tank, 1.8m3		Polypropylene	1	ea	2015		40	37	\$15,000	\$15,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	41	S-STP-PMP-41		Filter feed centrifugal pump, 8L/s @ 17-18m TDH	Weinman	ZK	Cast iron	2	ea	2015		20	17	\$10,000	\$20,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	FTR	43	S-STP-FTR-43		Sand filter, 21.64 m2 @ 6.5GPM/ft2, 8L/s	Waterco	SMD1800	FRR body	2	ea	2015		20	17	\$50,000	\$100,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	UV	45	S-STP-UV-45		UV disinfection, 4L/s	Voltrex	UVL-4K-15W	PVC body	1	ea	2015		20	17	\$15,000	\$15,000	Retrofitted to use Trojan parts		2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	UV	46	S-STP-UV-46		UV disinfection, 4L/s	Voltrex	V300-4-6-L-WS	PVC body	1	ea	2015		20	17	\$15,000	\$15,000	Retrofitted to use Trojan parts		2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	BLW	47	S-STP-BLW-47	56, 57	Air blower, 300m3/hr @ 54Pa	Aersen	GM7L 0NB0	Steel/Cast iron	4	ea	2015		20	17	\$30,000	\$120,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	ET	51	S-STP-ET-51	20 to 24	Sludge holding tank, 28-m3		Polypropylene	1	ea	2015		40	37	\$100,000	\$100,000	Fair		2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	52	S-STP-PMP-52		SF backwash pump, 8L/s @ 7.6m TDH	Myers	WHRS-15-53	Cast iron	2	ea	2015		20	17	\$15,500	\$31,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	ET	54	S-STP-ET-54		Reclaimed water storage tank, 21 m3		Concrete	1	ea	2015		40	37	\$80,000	\$80,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year		
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	55	S-STP-PMP-55		Reclaimed water pump, 4.1 L/s @ 97m TDH	Simflo	SGBC-11	Cast iron	2	ea	2015		20	17	\$15,000	\$30,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year	
1	813	927 Debelme rd		Sewage treatment plant	13198	S	PMP	57	S-STP-PMP-57		Reclaimed water pump, 4.1 L/s @ 97m TDH	Simflo	SGBC-11	Cast iron	1	ea	2015		20	17	\$15,000	\$15,000			2	2	4	Inspect/assess STP for deterioration to determine replacement timing				





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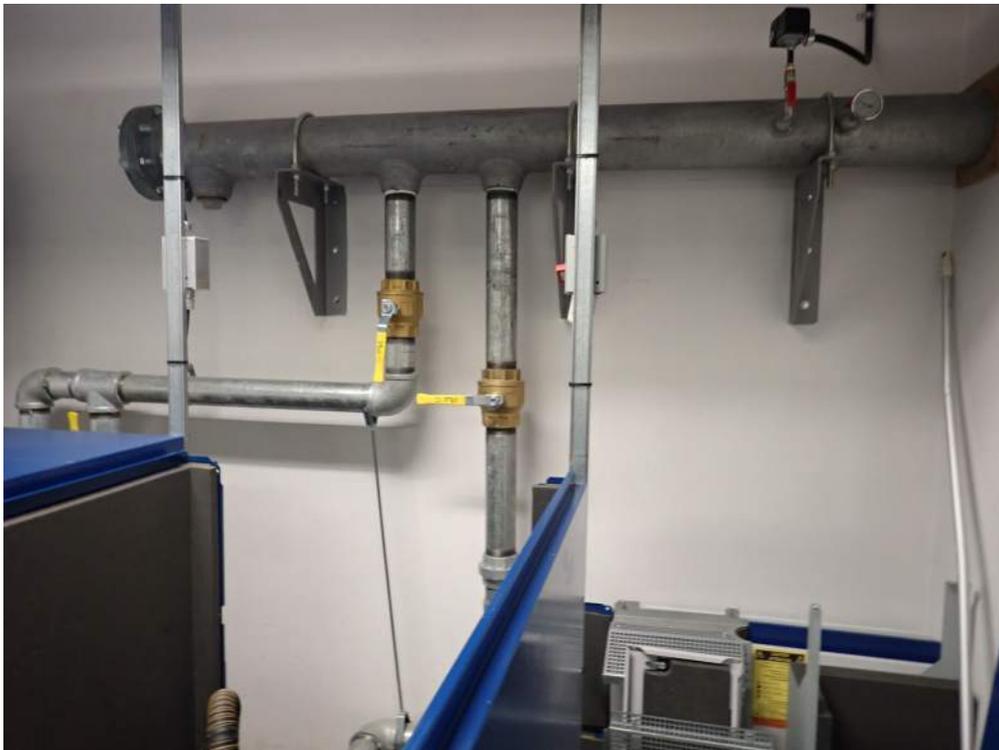


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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Mill Springs - Sewage Treatment Building - Functional Code 813**

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST											
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Expectancy or Action Interval	Est. Yr Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the building has been assumed based on information provided.	4	4	2013	21-Nov-17	MH	5	50	45	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	1300	\$20	SF	\$26,000	0%	5%	5%	\$29,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2013	21-Nov-17	MH	5	50	45	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	1300	\$10	SF	\$13,000	0%	5%	5%	\$15,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2013	21-Nov-17	MH	5	10	5	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No information was available regarding the scoping of the system to review for continuity.	4	4	2013	21-Nov-17	MH	5	50	45	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2013	21-Nov-17	MH	5	50	45	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	1300	\$40	SF	\$52,000	0%	5%	5%	\$58,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted wood siding and wood trim are present on the exterior walls.	3	3	2013	21-Nov-17	MH	5	10	2	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1400	\$8	SF	\$11,200	0%	15%	5%	\$14,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2013	21-Nov-17	MH	5	50	45	The wood siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1400	\$35	SF	\$49,000	0%	5%	5%	\$55,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Four painted metal doors are present on the building.	4	4	2013	21-Nov-17	MH	5	30	25	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	4	\$1,500	EA	\$6,000	0%	5%	5%	\$7,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	B Shell	B20 Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/ Windows	1	Two windows are present in the building.	4	4	2013	21-Nov-17	MH	5	30	25	Replace windows at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$200	EA	\$400	0%	5%	5%	\$1,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with wood shakes. MH understands that the roof is slated to be replaced.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	3	3	2013	21-Nov-17	MH	5	25	2	Replace the roof at the end of its service life. The timeline provided was taken from the information provided and should be confirmed.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	1500	\$8	SF	\$12,000	0%	5%	5%	\$14,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2013	21-Nov-17	MH	5	25	20	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$10	SF	\$1,000	0%	10%	5%	\$2,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	4	4	2013	21-Nov-17	MH	5	20	15	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Mill Springs - Sewage Treatment Building	Sewage Treatment Building	813	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2013	21-Nov-17	MH	5	20	15	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Mill Springs - Sewage Treatment Building - Functional Code 813



Photo 1



Photo 2



## 815 - Arbutus Ridge Sewer

Infrastructure Condition Assessment and Capital Plan

3717 Arbutus Drive North, Cobble Hill, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 8, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 4, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 815 - Arbutus Ridge Sewer

Infrastructure Condition Assessment and Capital Plan

3717 Arbutus Drive North, Cobble Hill, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Capital Upgrade/New	Construct new MBR wastewater treatment in existing RBC chambers (scheduled), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement timing/phasing.	\$3,000,000	\$3,150,000
	8	2	S-STP-DF-15	Capital Upgrade/New	Use raised mound as new disposal field (scheduled).	\$150,000	
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$3,150,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	3	ALL	Operations	Inspect/assess Arbutus Dr south lift station for deterioration to determine replacement timing/phasing.	\$2,000	\$6,000
	8	4	ALL	Operations	Inspect/assess Marine Vista lift station for deterioration to determine replacement timing/phasing.	\$2,000	
	9	5	ALL	Operations	Inspect/assess Crab Pot Lane lift station for deterioration to determine replacement timing/phasing.	\$2,000	
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	6 to 45	ALL	Operations	Inspect/assess the collection system for sources of I&I and determine replacement timing/phasing.	\$100,000	\$150,000
	14	8, 20, 28 and 39	As Noted	Operations	Inspect/assess forcemains for deterioration to determine replacement timing/phasing.	\$50,000	
	15						
	16						
	17						
						Total	\$156,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Name:	Crescent Valley Regional District (CVRD)
System:	Arbutus Ridge Sewer
Site address:	1111 Arbutus Dr North
Geographic Location:	North of Mill Bay
Coordinates:	Point 546

Infrastructure Condition Assessment

Asset ID	Function Code	Location	Address	Location	OWG Ref	Major	Minor	Spec	Asset Code	Photo	Description	Make	Model	Material/Quantity	Year Installed	Year Renewed	Service Life/Quantity	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Condition Assessment	Demand Condition	Probability of Failure	Severity of Failure	Conditions	Recommendations / Action Items	Type of Work	30 Year Capital Plan		Comments/Questions to be resolved
																														Replacement Cost	Timing	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	STP	1	25 to 40	Sewage treatment plant building, Rotating Biological Contractor (RBC) chamber			2	ea	1994	40	16	\$50,000	\$50,000	Refer to Arbutus Ridge Sewer System Building Condition Assessment						Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	2-5 Year		
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	FTB	2	5-STP-FTB-2	Rotating Biological Contractor (RBC) unit			1	ea	1994	40	16	\$50,000	\$50,000				2	3	3		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	2-5 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	PWP	3	5-STP-PWP-3	Feeding perimeter drain pump, 1 phase, 0-5hp	Fltpt	85402	2	ea	1994	20	0	\$5,000	\$10,000				3	2	3		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	2-5 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	PWP	5	5-STP-PWP-5	Mudg collection pump, 483 imp, 3 phase, 7.5hp	Fltpt	CT 1217671	1	ea	1994	20	0	\$5,000	\$5,000				3	2	3		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	2-5 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	PWP	6	5-STP-PWP-6	Sewage control pump, 473 imp, 3 phase, 1.7hp	Fltpt	DF9267	2	ea	1994	20	0	\$5,000	\$10,000				3	2	3		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	2-5 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	PWP	8	5-STP-PWP-8	Effluent sump return pump, 434 imp, 3 phase, 1700 rpm, 3.0 hp	Fltpt	CS 3085 MF	1	ea	1994	20	0	\$5,000	\$5,000				3	2	3		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	2-5 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	ET	9	5-STP-ET-9	17m sump and sludge collection chamber (balancing tank)			1	ea	1994	40	16	\$200,000	\$200,000				2	2	4		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	5-10 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	ET	10	5-STP-ET-10	Sewage control pumps and valves chamber (20 piping, valves)			1	ea	1994	40	16	\$20,000	\$20,000				2	2	4		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	5-10 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	ET	11	5-STP-ET-11	Mudg collection pump and valves chamber			1	ea	1994	40	16	\$20,000	\$20,000				2	2	4		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	5-10 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	COM	12	5-STP-COM-12	Sludge hoppers and piping			1	ea	1994	40	16	\$30,000	\$30,000				2	2	4		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	5-10 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	ET	13	5-STP-ET-13	Final effluent clarifier chamber			1	ea	1994	40	16	\$50,000	\$50,000				2	2	4		Construct new MBR wastewater treatment in existing RBC chamber (includes), replace communications, and inspect/assess the condition of the equipment remaining in place and determine replacement bring/going	Capital Upgrade/New	Included above	5-10 Year	
1	815	1111 Arbutus Dr North		Sewage treatment plant	8500082	S	STP	COM	14	5-STP-COM-14	Communications (CIP)			1	LS	1994	10	0	\$20,000	\$20,000	Hour	Does not meet standard		3	2	3		Replace communications in new wastewater treatment (see schedule)	Capital Upgrade/New	Included above	2-5 Year	
2	815	1111 Arbutus Dr North		Arbutus ridge golf course	8500082	S	STP	DP	15	5-STP-DP-15	2	1	LS	1987	40	9	\$20,000	\$20,000	Hour	Does not meet standard	Flow ball issues with break-out due to lack of drain rock under pipes	3	2	3		Flow ball issues with break-out due to lack of drain rock under pipes	Capital Upgrade/New	Included above	2-5 Year			
3	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	BLD	16	5-S-815-16	4 to 7	1	LS	1987	40	9	\$300,000	\$300,000	Good	Meets standard	Ability to meet capacity, some IBI issues	2	3	3		Inspect/assess Arbutus Dr south lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
3	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	PWP	17	5-S-PWP-17	4, 5	2	ea	1987	20	0	\$5,000	\$10,000	Good	Meets standard	Ability to meet capacity, users do not flush non-flushables	3	2	3		Inspect/assess Arbutus Dr south lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
3	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	COM	19	5-S-COM-19	4 to 6	1	LS	1987	10	0	\$20,000	\$20,000	Good	Meets standard	Ability to meet capacity, users do not flush non-flushables	3	2	3		Inspect/assess Arbutus Dr south lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
3	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	GEN	20	5-S-GEN-20	7	1	ea	1987	40	9	\$60,000	\$60,000	Good	Meets standard	Ability to meet capacity, users do not flush non-flushables	2	2	4		Inspect/assess Arbutus Dr south lift station for deterioration to determine replacement bring/going	Operations	Included above	5-10 Year			
4	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	BLD	21	5-S-815-21	9 to 18	1	LS	1987	40	9	\$400,000	\$400,000	Good - some signs of pipe corrosion	Meets standard	Ability to meet capacity (buses most of the flow)	2	3	3		Inspect/assess Marine Vista lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
4	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	PWP	22	5-S-PWP-22	13 to 15	2	ea	1987	20	0	\$30,000	\$60,000	Good	Meets standard	Ability to meet capacity, pumps operate in series	3	2	3		Inspect/assess Marine Vista lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
4	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	COM	24	5-S-COM-24	11	1	LS	1987	10	0	\$20,000	\$20,000	Good	Meets standard	Ability to meet capacity, users do not flush non-flushables	3	2	3		Inspect/assess Marine Vista lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
4	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	GEN	25	5-S-GEN-25	10, 17, 18	1	ea	2011	40	33	\$60,000	\$60,000	Good	Meets standard	Ability to meet capacity, users do not flush non-flushables	1	2	1		Inspect/assess Marine Vista lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
5	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	BLD	26	5-S-815-26	10 to 14	1	LS	1987	40	9	\$300,000	\$300,000	Good	Meets standard	Ability to meet capacity, some IBI issues	2	3	3		Inspect/assess Crab Pot Lane lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
5	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	PWP	27	5-S-PWP-27	22, 22	2	ea	1987	20	0	\$5,000	\$10,000	Good	Meets standard	Ability to meet capacity, users do not flush non-flushables	3	2	3		Inspect/assess Crab Pot Lane lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
5	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	COM	29	5-S-COM-29	20 to 22, 24	1	LS	1987	10	0	\$20,000	\$20,000	Good	Meets standard	Ability to meet capacity, users do not flush non-flushables	3	2	3		Inspect/assess Crab Pot Lane lift station for deterioration to determine replacement bring/going	Operations	Included above	2-5 Year			
5	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	GEN	30	5-S-GEN-30	20, 22 to 24	1	ea	1987	40	9	\$60,000	\$60,000	Good	Meets standard	Ability to meet capacity, users do not flush non-flushables	2	2	4		Inspect/assess Crab Pot Lane lift station for deterioration to determine replacement bring/going	Operations	Included above	5-10 Year			
6	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	MH	31	5-S-MH-31	Catch basin			1	ea	1994	40	16	\$8,000	\$8,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
6	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	MH	32	5-S-MH-32	Sanitary MH 12			1	ea	1994	40	16	\$8,000	\$8,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
7	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	MH	33	5-S-MH-33	Sewermain, 200mm			300	m	1987	80	49	\$550	\$165,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
7	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	MH	34	5-S-MH-34	Sewer manhole (E/S 53, Ex. 55-56)			5	ea	1987	40	9	\$40,000	\$40,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
7	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	CO	35	5-S-CO-35	Sewer cleanout (E/S 53, Ex. 55-56)			1	ea	1987	40	9	\$3,000	\$3,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
8	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	S	36	5-S-S-36	Sewermain, 200mm			165	m	1987	80	49	\$550	\$90,750				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
8	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	MH	37	5-S-MH-37	Sewer manhole (S/S 53)			2	ea	1987	40	9	\$40,000	\$40,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
8	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	S	38	5-S-S-38	Sewermain, 200mm			183	m	1987	80	49	\$500	\$111,900				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
8	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	PP	39	5-S-PP-39	Force main, 200mm			1,250	m	1987	80	49	\$550	\$687,500				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
8	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	S	40	5-S-S-40	Sewermain, 200mm			1,250	m	1987	80	49	\$550	\$1,125,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
8	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	MH	41	5-S-MH-41	Sewer manhole (S/S 53, Ex. 55-56)			2	ea	1987	40	9	\$40,000	\$40,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
9	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	S	42	5-S-S-42	Sewermain, 200mm			170	m	1994	80	49	\$550	\$93,750				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
9	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	MH	43	5-S-MH-43	Sewer manhole (S/S 53), 1.8-3m depth			10	ea	1994	40	16	\$8,000	\$80,000				2	2	4		Inspect/assess the collection system for sources of IBI and determine replacement bring/going	Operations	Included in 100,000	5-10 Year	
10	815	1111 Arbutus Dr North		Site Visit / Photos	8500082	S	LS	S	44	5-S																						

33	835	1737 Arbutus Dr North	PARK LANE	GIS	S	SS	S	82	5-55-5-82				105	m	1987		80	49	\$500	\$52,267					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
34	835	1737 Arbutus Dr North	HARBORWAY PLACE	GIS	S	SS	S	83	5-55-5-83				89	m	1987		80	49	\$500	\$44,592					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
35	835	1737 Arbutus Dr North	PINE RIDGE COURT	GIS	S	SS	S	84	5-55-5-84				87	m	1987		80	49	\$500	\$43,211					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
36	835	1737 Arbutus Dr North	PINE RIDGE DRIVE	GIS	S	SS	S	85	5-55-5-85				77	m	1987		80	49	\$500	\$38,392					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
36	835	1737 Arbutus Dr North	PINE RIDGE DRIVE	GIS	S	SS	S	86	5-55-5-86				113	m	1987		80	49	\$550	\$171,866					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
37	835	1737 Arbutus Dr North	PINE RIDGE PLACE	GIS	S	SS	S	87	5-55-5-87				89	m	1987		80	49	\$500	\$44,658					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
38	835	1737 Arbutus Dr North	MULTIPLE ROAD	GIS	S	SS	S	88	5-55-5-88				127	m	1987		80	49	\$550	\$69,899					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
39	835	1737 Arbutus Dr North	RIDGE LANE	GIS	S	PM	PP	89	5-PM-PP-89				31	m	1987		80	49	\$400	\$13,200					2	2	4	Project/Issues for amount for determination to determine replacement timing/quantity	Operations	Included in \$50,000	5-30 Year
39	835	1737 Arbutus Dr North	RIDGE LANE	GIS	S	SS	S	90	5-55-5-90				106	m	1987		80	49	\$500	\$53,144					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
39	835	1737 Arbutus Dr North	RIDGE LANE	GIS	S	SS	S	91	5-55-5-91				87	m	1987		80	49	\$550	\$53,534					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
40	835	1737 Arbutus Dr North	SALTSPRING DRIVE	GIS	S	SS	S	92	5-55-5-92				235	m	1987		80	49	\$500	\$127,373					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
41	835	1737 Arbutus Dr North	SEAVIEW PLACE	GIS	S	SS	S	93	5-55-5-93				85	m	1987		80	49	\$550	\$38,222					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
42	835	1737 Arbutus Dr North	SEAVIEW WAY	GIS	S	SS	S	94	5-55-5-94				148	m	1987		80	49	\$500	\$14,047					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
42	835	1737 Arbutus Dr North	SEAVIEW WAY	GIS	S	SS	S	95	5-55-5-95				268	m	1987		80	49	\$550	\$147,278					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
43	835	1737 Arbutus Dr North	SPRING HILL	GIS	S	SS	S	96	5-55-5-96				18	m	1987		80	49	\$500	\$28,999					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
44	835	1737 Arbutus Dr North	ST ANDREW'S LANE	GIS	S	SS	S	97	5-55-5-97				41	m	1987		80	49	\$550	\$22,337					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
45	835	1737 Arbutus Dr North	Inflow system	GIS	S	SI	SI	98	5-55-5-98				605	sq	1987		40	0	\$1,000	\$1,961,000					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
45	835	1737 Arbutus Dr North	Inflow system	GIS	S	SI	SI	99	5-55-5-99				139	sq	1987		40	0	\$6,000	\$1,513,200					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
45	835	1737 Arbutus Dr North	Inflow system	GIS	S	SI	SI	100	5-55-5-100				25	sq	1987		40	0	\$1,000	\$79,000					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
45	835	1737 Arbutus Dr North	Inflow system	GIS	S	SI	SI	101	5-55-5-101				0	sq	1987		40	0	\$100,000	\$0					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year
45	835	1737 Arbutus Dr North	Inflow system	GIS	S	SI	SI	102	5-55-5-102				0	sq	1987		40	0	\$20,000	\$0					2	2	4	Project/Issues the collection system for sources of 80 and determine replacement timing/quantity	Operations	Included in \$100,000	5-30 Year

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**FIELD INSPECTION**

SYSTEM: Arbutus Ridge Sewer DATE: Nov. 24/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 815 PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic) Disposal Field  
old RBL never wanted  
(to be replaced) @ D boxes on

2) \_\_\_\_\_

815 (1)



815 (2)  
1 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (3)



815 (4)  
2 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (5)

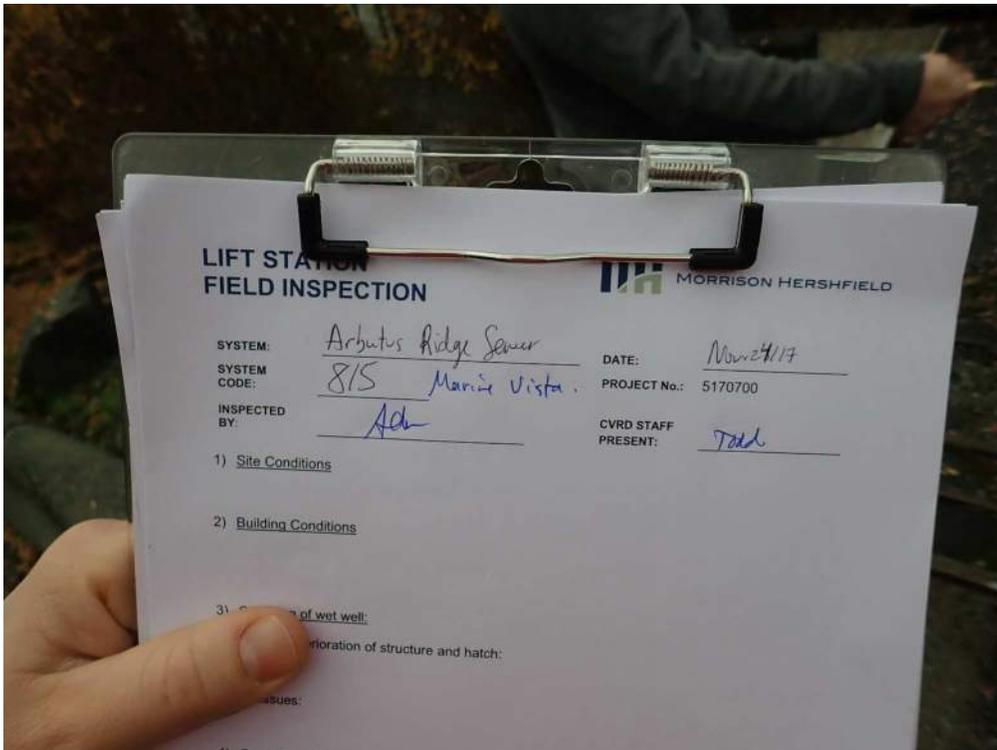


815 (6)  
3 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (7)



815 (8)  
4 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (9)



815 (10)  
5 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (11)



815 (12)  
6 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (13)



815 (14)  
7 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (15)



815 (16)  
8 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (17)



815 (18)  
9 of 20

## 815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**LIFT STATION  
FIELD INSPECTION**

MORRISON HERSHFIELD

SYSTEM: Arbutus Ridge Sewer DATE: Nov. 29/17  
SYSTEM CODE: 815 Grab Pot. PROJECT No.: 5170700  
INSPECTED BY: Adam CVRD STAFF PRESENT: Todd

1) Site Conditions

2) Building Conditions

3) Condition of wet well:  
Visible Deterioration of structure and hatch:

815 (19)

815 (20)  
10 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (21)



815 (22)  
11 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (23)



815 (24)  
12 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**SEWAGE TREATMENT PLANT FIELD INSPECTION** MORRISON HERSHFIELD

SYSTEM: Arbutus Ridge Sewer DATE: Nov. 24/17  
LOCATION: Golf course. PROJECT No.: 5170700  
SYSTEM CODE: 815 CVRD STAFF PRESENT: Todd.  
INSPECTED BY: Adan

1) Type of Treatment System (Schematic) Disposal Field  
old RBL never wanted (to be replaced)  
↳ bio film was accumulating ↳ in runs backfilled w/ 1/2 drain rock.  
↳ cleaned out ↳ closing drain pipe

2) Site Conditions/Security  
↳ had issues w/ break-out due to no drain rock under pipes.

3) Condition of Structure:

815 (25)



815 (26)  
13 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (27)



815 (28)  
14 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (29)

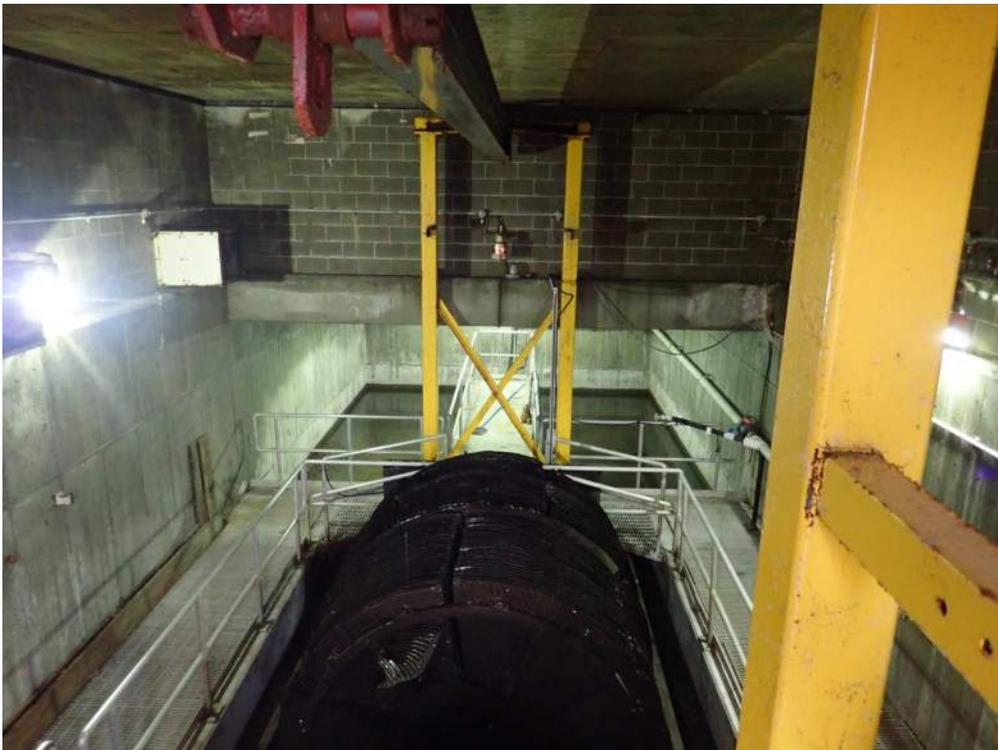


815 (30)  
15 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (31)



815 (32)  
16 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (33)



815 (34)  
17 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (35)



815 (36)  
18 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (37)



815 (38)  
19 of 20

815 Arbutus Ridge Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



815 (39)



815 (40)  
20 of 20

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Arbutus Ridge - Sewage Treatment Building (1 & 2) - Functional Code 815**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Yr to Next U/R Check or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	4	4	2008	21-Nov-17	MH	10	50	40	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	1600	\$8	SF	\$12,800	0%	5%	5%	\$15,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2008	21-Nov-17	MH	10	50	40	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	1600	\$8	SF	\$12,800	0%	5%	5%	\$15,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2008	21-Nov-17	MH	10	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	2	\$500	LS	\$1,000	0%	0%	5%	\$2,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2008	21-Nov-17	MH	10	50	43	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks with a wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2008	21-Nov-17	MH	10	50	40	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements	1	Wood cladding and wood trim (included roof framing) is present through sections of the building (mainly gable ends). Some deterioration was noted in these elements.	3	3	2008	21-Nov-17	MH	10	12	2	Repaint wood cladding, install flashing over exposed wood roof framing.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	10%	5%	\$4,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	2008	21-Nov-17	MH	10	50	40	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	210	\$20	SF	\$4,200	0%	10%	5%	\$5,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	4	4	2008	21-Nov-17	MH	10	30	20	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	4	\$1,500	EA	\$6,000	0%	5%	5%	\$7,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1	The roof is sloped assembly which has been waterproofed with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders .	4	4	2008	21-Nov-17	MH	10	25	15	Replace asphalt shingle roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	1800	\$8	SF	\$14,400	0%	5%	5%	\$16,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1	The roof is sloped assembly which has been waterproofed with a metal roof assembly.  The roof drains via aluminum gutters to rain water leaders .	4	4	2008	21-Nov-17	MH	10	30	20	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$10	LF	\$1,000	0%	10%	5%	\$2,000
Arbutus Ridge - Sewage Treatment Building (1 & 2)	Sewage Treatment Building	815	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2008	21-Nov-17	MH	10	20	10	Replace lights at the end of their service life.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Arbutus Ridge -Sewer - Functional Code 815



Photo 1



## 820 - Eagle Heights Sewer

Infrastructure Condition Assessment and Capital Plan

2703 Christopher Road, Koksilah, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 8, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 4, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 820 - Eagle Heights Sewer

Infrastructure Condition Assessment and Capital Plan  
2703 Christopher Road, Koksilah, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintainance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-LS-ELC-7	Capital Renewal	Upgrade electrical in the lift station.	\$30,000	\$130,000
	8	1	S-LS-PP-8	Capital Renewal	Replace process piping in the lift station (scheduled).	\$100,000	
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$130,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-LS-PMP-2 to S-LS-GEN-6	Operations	Inspect/assess the condition of the lift station, pumps, communications, flow meter, and generator, for deterioration to determine replacement timing/phasing.	\$20,000	\$20,000
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	2, 3, 5 to 35	ALL	Operations	Inspect/assess the collection system for sources of I&I and determine replacement timing/phasing.	\$80,000	\$80,000
	14						
	15						
	16						
	17						
						Total	\$100,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	820 Eagle Heights Sewer
Civic Address:	2703 Christopher rd
Geographic Location:	South of Duncan
Customers:	434
Users:	760

Infrastructure Condition Assessment

		Current Year		2018		Total Replacement Value		\$8,779,457		Value per user		\$11,352																												
Asset ID	Function Code	Location	Address	Location	DWG Ref	Major	Minor	Spec	ID	Asset Code	Photo	Description	Make	Model	Material	Quantity	Unit	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Demand Condition	Probability of Failure	Severity of Failure	Condition	Recommendations / Action Items	Type of Work	10 Year Capital Plan	Budget Estimate	Timing	Comment/Question to be resolved					
1	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	U/L Station	Site Visit / Photos	5	LS	BLD	1	S-LS-BLD-1	1 to 12	U/L station building				1	ea	2003		40	25	Refer to Eagle Heights Sewer System Building Condition Assessment.									Refer to Eagle Heights Sewer System Building Condition Assessment.								
1	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	U/L Station	Site Visit / Photos	5	LS	PMP	2	S-LS-PMP-2	6	Pump (LS)				2	ea	2003		20	5	\$5,000	\$10,000	Fair	Meets standard	2	2	4	Inspect/Assess the condition of the lift station, pumps, communications, flow meter, and generator for deterioration to determine replacement timing/phasing.	Operations	Included above	\$20,000	5-10 Year						
1	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	U/L Station	Site Visit / Photos	5	LS	COM	4	S-LS-COM-4	3 to 5, 8 to 10	Communications (LS)				1	LS	2003		10	0	\$20,000	\$20,000	Fair	Meets standard	3	2	3	Assess/Inspect communication system for deterioration to determine replacement timing/phasing.	Operations	Included above		2-5 Year						
1	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	U/L Station	Site Visit / Photos	5	LS	FM	5	S-LS-FM-5	7	Flow meter	Siemens	F M Magflo MA65000		1	ea	2003		20	5	\$10,000	\$10,000	Fair	Meets standard	3	1	4	Assess/Inspect flow meter for deterioration to determine replacement timing/phasing.	Operations	Included above		5-10 Year						
1	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	U/L Station	Site Visit / Photos	5	LS	GEN	6	S-LS-GEN-6	11, 12	Generator (LS)	Generac		1	ea	2003		40	25	\$40,000	\$40,000	Good	Meets standard	2	2	4	Assess/Inspect generator for deterioration to determine replacement timing/phasing.	Operations	Included above		5-10 Year							
1	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	U/L Station	Site Visit / Photos	5	LS	ELEC	7	S-LS-ELEC-7	3, 10	Electrical (LS)				1	LS	2003		30	5	\$20,000	\$20,000	Fair	Does not meet standard	1	1	3	Upgrade electrical in the lift station.	Capital Renewal	Included above	\$20,000	2-5 Year						
1	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	U/L Station	Site Visit / Photos	5	LS	PP	8	S-LS-PP-8	NA	Process piping (w/ valves, pipes, tees)				1	LS	2003		30	15	\$40,000	\$40,000	Poor	Does not meet standard	3	3	3	Replace process piping in the lift station (schedule).	Capital Renewal	Included above	\$100,000	2-5 Year						
2	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Entire drawing set	002-012-00	5	SS	MH	9	S-SS-MH-9		Sewer manholes (MH1-MH13)				118	ea	1976		40	0	\$8,000	\$944,000																
3	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Building service, 0-028	121-22193-00	5	SS	MH	10	S-SS-MH-10		SMH B, 2m depth, 1050mm				1	ea	2015		40	37	\$8,000	\$8,000																
3	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Building service, 0-028	121-22193-00	5	SS	MH	11	S-SS-MH-11		Ex. SMH 1, 2m depth, 1050mm				1	ea	1990		40	12	\$8,000	\$8,000																
3	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Building service, 0-068	121-22193-00	5	SS	MH	12	S-SS-MH-12		Ex. SMH 2, 1050mm				1	ea	1990		40	12	\$8,000	\$8,000																
3	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Building service, 0-110	121-22193-00	5	SS	CO	13	S-SS-CO-13		SCD				1	ea	1990		40	12	\$3,000	\$3,000																
3	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Building service, SMH A-SMH B	121-22193-00	5	SS	S	14	S-SS-S-14		Sewermain, 200mm	SDR35	PVC	18	m	2015		80	77	\$550	\$10,065																	
3	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Building service, SMH B-Ex. SMH 1	121-22193-00	5	SS	S	15	S-SS-S-15		Sewermain, 200mm	SDR35	PVC	9	m	2015		80	77	\$550	\$5,110																	
3	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Building service, Ex. SMH 1 Ex. SMH 2	121-22193-00	5	SS	S	16	S-SS-S-16		Sewermain, 200mm	SDR35	PVC	40	m	1976		80	38	\$550	\$22,000																	
3	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Building service, Ex. SMH 2-SCD	121-22193-00	5	SS	S	17	S-SS-S-17		Sewermain, 200mm	SDR35	PVC	42	m	1976		80	38	\$550	\$23,100																	
4	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Tram Canada Hwy / Charter rd, 0-105	121-22193-00	5	SS	MH	18	S-SS-MH-18		SMH A, 2.2m depth, 1050mm				1	ea	2015		40	37	\$8,000	\$8,000																
4	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Tram Canada Hwy / Charter rd, 0-109	121-22193-00	5	SS	MH	19	S-SS-MH-19		SMH 14, 2m depth, 1050mm				1	ea	2015		40	37	\$8,000	\$8,000																
4	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Tram Canada Hwy / Charter rd, 0-109	121-22193-00	5	SS	MH	20	S-SS-MH-20		SMH 13, 2.2m depth, 1050mm				1	ea	2015		40	37	\$8,000	\$8,000																
4	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Tram Canada Hwy / Charter rd, SMH 15-18	121-22193-00	5	SS	S	21	S-SS-S-21		Sewermain, 200mm	SDR35	PVC	20	m	2015		80	77	\$550	\$11,000																	
4	820	2703 Christopher rd	2703 Christopher rd	2703 Christopher rd	Tram Canada Hwy / Charter rd, SMH A, SMH 2	121-22193-00	5	SS	S	22	S-SS-S-22		Sewermain, 200mm	SDR35	PVC	52	m	2015		80	77	\$550	\$28,655																	
5	820	2703 Christopher rd	2703 Christopher rd	ALLEBURY ROAD	GIS	5	SS	S	23	S-SS-S-23		Sewermain, unknown diameter				1,834	m	1976		80	38	\$550	\$998,532																	
6	820	2703 Christopher rd	2703 Christopher rd	BOAL ROAD	GIS	5	SS	S	24	S-SS-S-24		Sewermain, unknown diameter				221	m	1976		80	38	\$550	\$121,700																	
7	820	2703 Christopher rd	2703 Christopher rd	BOTWOOD LANE	GIS	5	SS	S	25	S-SS-S-25		Sewermain, 200mm				24	m	1976		80	38	\$550	\$13,188																	
8	820	2703 Christopher rd	2703 Christopher rd	BOYS ROAD	GIS	5	SS	S	26	S-SS-S-26		Sewermain, unknown diameter				551	m	1976		80	38	\$550	\$303,318																	
9	820	2703 Christopher rd	2703 Christopher rd	BRANDT CRESCENT	GIS	5	SS	S	27	S-SS-S-27		Sewermain, unknown diameter				211	m	1976		80	38	\$550	\$116,127																	
10	820	2703 Christopher rd	2703 Christopher rd	BRIGHT PLACE	GIS	5	SS	S	28	S-SS-S-28		Sewermain, unknown diameter				122	m	1976		80	38	\$550	\$67,259																	
11	820	2703 Christopher rd	2703 Christopher rd	CHRISTOPHER ROAD	GIS	5	SS	S	29	S-SS-S-29		Sewermain, 450mm				236	m	1976		80	38	\$700	\$164,889																	
12	820	2703 Christopher rd	2703 Christopher rd	CHRISTOPHER ROAD	GIS	5	SS	S	30	S-SS-S-30		Sewermain, 500mm				15	m	1976		80	38	\$750	\$10,959																	
13	820	2703 Christopher rd	2703 Christopher rd	CHRISTOPHER ROAD	GIS	5	SS	S	31	S-SS-S-31		Sewermain, unknown diameter				5	m	1976		80	38	\$550	\$2,787																	
14	820	2703 Christopher rd	2703 Christopher rd	DODDWOOD ROAD	GIS	5	SS	S	32	S-SS-S-32		Sewermain, unknown diameter				418	m	1976		80	38	\$550	\$229,808																	
15	820	2703 Christopher rd	2703 Christopher rd	EAGLE HEIGHTS ROAD	GIS	5	SS	S	33	S-SS-S-33		Sewermain, unknown diameter				299	m	1976		80	38	\$550	\$164,429																	
16	820	2703 Christopher rd	2703 Christopher rd	ELEANOR STREET	GIS	5	SS	S	34	S-SS-S-34		Sewermain, unknown diameter				166	m	1976		80	38	\$550	\$91,355																	
17	820	2703 Christopher rd	2703 Christopher rd	FRANES STREET	GIS	5	SS	S	35	S-SS-S-35		Sewermain, unknown diameter				380	m	1976		80	38	\$550	\$208,753																	
18	820	2703 Christopher rd	2703 Christopher rd	GLENORA ROAD	GIS	5	SS	S	36	S-SS-S-36		Sewermain, unknown diameter				903	m	1976		80	38	\$550	\$496,426																	
19	820	2703 Christopher rd	2703 Christopher rd	HYKAWY ROAD	GIS	5	SS	S	37	S-SS-S-37		Sewermain, unknown diameter				470	m	1976		80	38	\$550	\$258,606																	
20	820	2703 Christopher rd	2703 Christopher rd	JACOB ROAD	GIS	5	SS	S	38	S-SS-S-38		Sewermain, unknown diameter				192	m	1976		80	38	\$550	\$105,869																	
21	820	2703 Christopher rd	2703 Christopher rd	KOKSLAH FRONTAGE ROAD	GIS	5	SS	S	39	S-SS-S-39		Sewermain, unknown diameter				956	m	1976		80	38	\$550	\$525,593																	
22	820	2703 Christopher rd	2703 Christopher rd	KOKSLAH ROAD	GIS	5	SS	S	40	S-SS-S-40		Sewermain, unknown diameter				955	m	1976		80	3																			

820 Eagle Heights Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**LIFT STATION  
FIELD INSPECTION**

MORRISON HERSHFIELD

SYSTEM: Eagle Heights Sewer DATE: Nov. 20/17  
SYSTEM CODE: 820 PROJECT No.: 5170700  
INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Site Conditions  
- 20' above from neighbouring fenced area

2) Building Conditions  
- site security

3) Condition of wet well:  
visible Deterioration of structure and hatch:

820 (1)



820 (2)

820 Eagle Heights Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



820 (3)



820 (4)  
2 of 6

820 Eagle Heights Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



820 (5)



820 (6)  
3 of 6

820 Eagle Heights Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



820 (7)



820 (8)  
4 of 6

820 Eagle Heights Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



820 (9)



820 (10)  
5 of 6

820 Eagle Heights Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



820 (11)



820 (12)

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Eagle Heights Sewage - Lift Station - Functional Code 820**

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			If recommended work not complete can the rate of deterioration be expected to increase?		Will a failure in this system lead to a loss of use of the facility?		Can the current condition adversely affect the buildings security of safety?		OPINION OF PROBABLE COST						
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to Complete or Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	Yes	No	Yes	No	Yes	No	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.
Eagle Heights Sewage - Lift Station	Sewage Treatment Building	820	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the building was not able to be confirmed and has been assumed.	4	4	1990	21-Nov-17	MH	28	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	550	\$20	SF	\$11,000	0%	5%	5%	\$13,000
Eagle Heights Sewage - Lift Station	Sewage Treatment Building	820	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	550	\$10	SF	\$5,500	0%	5%	5%	\$7,000
Eagle Heights Sewage - Lift Station	Sewage Treatment Building	820	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks with a wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	32	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Eagle Heights Sewage - Lift Station	Sewage Treatment Building	820	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements	1	Wood cladding and wood trim (included roof framing) is present through sections of the building. Some deterioration was noted in these elements.	3	3	1990	21-Nov-17	MH	28	12	2	Repaint wood cladding. Install flashing over exposed wood roof framing.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	10%	5%	\$1,000
Eagle Heights Sewage - Lift Station	Sewage Treatment Building	820	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	1990	21-Nov-17	MH	28	30	5	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Eagle Heights Sewage - Lift Station	Sewage Treatment Building	820	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof Assembly	1	The roof is sloped assembly which has been waterproofed with an SBS membrane. MH did not have roof access during this review.  The roof drains via aluminum gutters to rain water leaders.	4	4	1990	21-Nov-17	MH	28	30	5	Replace roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	600	\$8	SF	\$4,800	0%	5%	5%	\$6,000
Eagle Heights Sewage - Lift Station	Sewage Treatment Building	820	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	1990	21-Nov-17	MH	28	20	5	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000





## 830 - Maple Hills Sewer

Infrastructure Condition Assessment and Capital Plan  
3504 Hidden Oaks Crescent, Cobble Hill, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 8, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 4, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 830 - Maple Hill Sewer

Infrastructure Condition Assessment and Capital Plan  
3504 Hidden Oaks Crescent, Cobble Hill, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	S-LS-COM-6 and S-LS-GEN-7	Capital Renewal	Replace the electrical and communications, and the generator in the lift station.	\$100,000	\$100,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$100,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	S-LS-PMP-8 and S-LS-PP-9	Operations	Inspect/assess the condition of the lift station, pumps and process piping.	\$10,000	\$10,000
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	1	ALL	Operations	Inspect/assess the condition of the wastewater treatment plant, RBC unit and process piping. Consider pumping to Twin Cedars (scheduled).	\$30,000	\$35,000
	14	3	S-FM-PP-10	Operations	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	\$5,000	
	15						
	16						
	17						
						Total	\$45,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	830 Maple Hills Sewer
Civic Address:	3504 Hidden Oaks Cres
Geographic Location:	East of Cobble Hill
Customers:	Parcels: 60
Users:	60

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$1,981,806
		Value per user	\$33,030

Asset ID	Location				Asset Inventory										Condition Assessment					Recommendations / Action Items			10 Year Capital Plan												
	Function Code	Address	Location	DWG Ref	Major	Minor	Spec	ID	Asset Code	Photo	Description	Make	Model	Material	Quantity	Unit	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Demand Condition	Probability of Failure	Severity of Failure	Condition	Description	Type of Work	Budget Estimate	Timing	Comment/Question to be resolved		
1	830	3504 Hidden Oaks Cres.	Sewage treatment plant	Site Visit / Photos	S	STP	STP	1	S-STP-STP-1	2 to 9, 16, 19	Sewage treatment plant building, RBC chamber				1	ea	1993		40	15	Refer to Maple Hills Sewer System Building Condition Assessment.	\$350,000	\$350,000	Fair - chain requires periodic replacement, shaft replaced in 2007	Meets standard	Ables to meet capacity	2	2	4	Inspect/assess the condition of the wastewater treatment plant, RBC unit and process piping. (Consider pumping to Twin Cedars (scheduled)).	Operations	\$30,000	5-10 Year		
1	830	3504 Hidden Oaks Cres.	Sewage treatment plant	Site Visit / Photos	S	STP	PP	3	S-STP-PP-3	3, 7 to 9	Process piping c/w valves, pipes, tees				1	LS	1993		30	5	\$150,000	\$150,000	Fair			2	2	4	Inspect/assess the condition of the process piping	Operations	Included above	5-10 Year			
1	830	3504 Hidden Oaks Cres.	Sewage treatment plant	Site Visit / Photos	S	STP	STR	4	S-STP-STR-4	3, 6	Puraff odour control filter system				1	ea	2015		20	17	\$30,000	\$30,000	Good	Meets standard		1	1	5							
2	830	3504 Hidden Oaks Cres.	Lift station to disposal field	Site Visit / Photos	S	LS	BLD	5	S-LS-BLD-5	5, 10 to 17	Lift station building				1	ea	1993		40	15	Refer to Maple Hills Sewer System Building Condition Assessment.										Refer to Maple Hills Sewer System Building Condition Assessment.				
2	830	3504 Hidden Oaks Cres.	Lift station to disposal field	Site Visit / Photos	S	LS	CDM	6	S-LS-CDM-6	13, 14	Communications/Electrical (LS)				1	LS	1993		10	0	\$15,000	\$15,000	Poor	Does not meet standard		3	2	3	Replace the electrical and communications, and the generator in the lift station.	Capital Renewal	\$100,000	2-5 Year			
2	830	3504 Hidden Oaks Cres.	Lift station to disposal field	Site Visit / Photos	S	LS	GEN	7	S-LS-GEN-7	12	Generator (LS)				1	ea	1993		40	15	\$60,000	\$60,000	Poor - old	Does not meet standard		3	2	3	Replace the generator in the lift station.	Capital Renewal	Included above	2-5 Year			
2	830	3504 Hidden Oaks Cres.	Lift station to disposal field	Site Visit / Photos	S	LS	PKM	8	S-LS-PPM-8	13	Pumps (LS)				2	ea	1993		20	0	\$5,000	\$10,000				3	2	3	Inspect/assess the condition of the lift station, pumps and process piping.	Operations	\$10,000	2-5 Year			
2	830	3504 Hidden Oaks Cres.	Lift station to disposal field	Site Visit / Photos	S	LS	PP	9	S-LS-PP-9	12	Process piping c/w valves, pipes, tees				1	LS	1993		30	5	\$60,000	\$60,000				3	2	3	Inspect/assess the condition of the process piping	Operations	Included above	2-5 Year			
3	830	3504 Hidden Oaks Cres.	HIDDEN OAKS CRESCENT	GIS	S	FM	PP	10	S-FM-PP-10		Foremain, unknown diameter, assumed 150mm					m	1993		40	15	\$500	\$270,915				1	3	4	Inspect/assess the condition of the foremain for deterioration to determine replacement phasing/timing.	Operations	\$5,000	5-10 Year			
3	830	3504 Hidden Oaks Cres.	HIDDEN OAKS CRESCENT	GIS	S	SS	S	11	S-SS-S-11		Sewermain, unknown diameter, assumed 200mm				542	m	1993		40	15	\$550	\$302,174				1	2	5							
4	830	3504 Hidden Oaks Cres.	PECHANGA CLOSE	GIS	S	SS	S	12	S-SS-S-12		Sewermain, unknown diameter, assumed 200mm				119	m	1993		40	15	\$550	\$65,695				1	2	5							
5	830	3504 Hidden Oaks Cres.	SITKA WAY	GIS	S	SS	S	13	S-SS-S-13		Sewermain, unknown diameter, assumed 200mm				316	m	1993		40	15	\$550	\$174,022				1	2	5							
6	830	3504 Hidden Oaks Cres.	Entire system	GIS	S	SS	SV	14	S-SS-SV-14		Sewer Service Connections				61	ea	1993		80	55	\$3,000	\$183,000				1	2	5							
6	830	3504 Hidden Oaks Cres.	Entire system	GIS	S	SS	MH	15	S-SS-MH-15		Sewer manholes				12	ea	1993		40	15	\$8,000	\$96,000				1	2	5							
6	830	3504 Hidden Oaks Cres.	Entire system	GIS	S	SS	CO	16	S-SS-CO-16		Sewer Chicanots				5	ea	1993		40	15	\$1,000	\$5,000				1	2	5							
6	830	3504 Hidden Oaks Cres.	Entire system	GIS	S	STP	DF	17	S-STP-DF-17		Disposal field				1	ea	1993		40	15	\$150,000	\$150,000				1	2	5							
6	830	3504 Hidden Oaks Cres.	Entire system	GIS	S	STP	DF	18	S-STP-DF-18		Disposal field building				1	ea	1993		40	15	\$20,000	\$20,000				1	2	5							

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**SEWAGE TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Maple Hill Sewer DATE: Nov 23/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 830 PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic)

2) Site Conditions/Security

3) Condition of Structure:

830 (1)



830 (2)  
1 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (3)



830 (4)  
2 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (5)



830 (6)  
3 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (7)



830 (8)  
4 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (9)

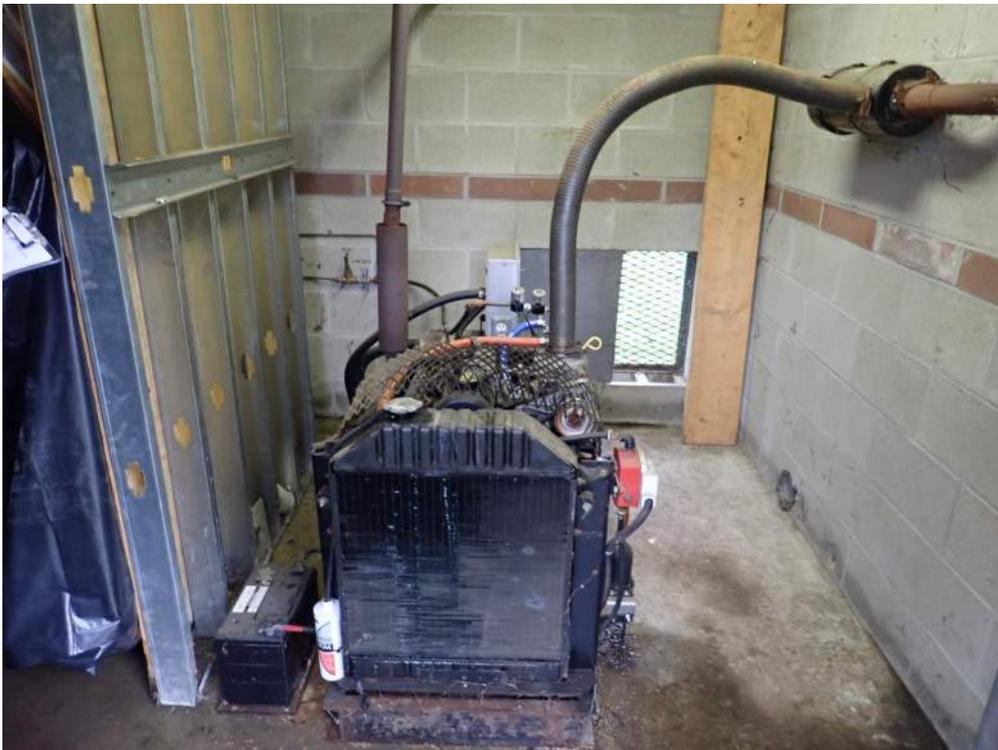


830 (10)  
5 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (11)



830 (12)  
6 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (13)



830 (14)  
7 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (15)



830 (16)  
8 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (17)



830 (18)  
9 of 10

830 Maple Hill Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



830 (19)

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Maple Hill -Lift Station - Functional Code 830**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to Complete or Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Maple Hill -Lift Station	Sewage Treatment Building	830	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the building was not confirmed and has been assumed.	4	4	2000	21-Nov-17	MH	18	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	110	\$30	SF	\$3,300	0%	5%	5%	\$4,000
Maple Hill -Lift Station	Sewage Treatment Building	830	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2000	21-Nov-17	MH	18	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	110	\$30	SF	\$3,300	0%	5%	5%	\$4,000
Maple Hill -Lift Station	Sewage Treatment Building	830	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2000	21-Nov-17	MH	18	50	32	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Maple Hill -Lift Station	Sewage Treatment Building	830	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements	1	Wood cladding and wood trim (included roof framing) is present through sections of the building. The wood cladding sections appear to be retrofit areas. Some deterioration was noted in these elements.	3	3	2000	21-Nov-17	MH	18	12	2	Repaint wood cladding. Install flashing over exposed wood roof framing.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	10%	5%	\$1,000
Maple Hill -Lift Station	Sewage Treatment Building	830	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	2000	21-Nov-17	MH	18	30	12	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Maple Hill -Lift Station	Sewage Treatment Building	830	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1	The roof is sloped assembly which has been waterproofed cedar shakes.	4	4	2000	21-Nov-17	MH	18	23	5	Replace metal roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	120	\$30	SF	\$3,600	0%	5%	5%	\$4,000
Maple Hill -Lift Station	Sewage Treatment Building	830	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2000	21-Nov-17	MH	18	20	10	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District

Maple Hill -Lift Station - Functional Code 830



Photo 1



Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Maple Hill - Sewage Treatment Building - Functional Code 830

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to Complete or Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Maple Hill - Sewage Treatment Building	Sewage Treatment Building	830	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete and concrete block foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations. The age of the building was not confirmed and has been assumed.	4	4	1990	21-Nov-17	MH	28	50	22	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	150	\$20	SF	\$3,000	0%	5%	5%	\$4,000
Maple Hill - Sewage Treatment Building	Sewage Treatment Building	830	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	22	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	150	\$10	SF	\$1,500	0%	5%	5%	\$2,000
Maple Hill - Sewage Treatment Building	Sewage Treatment Building	830	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks. Some efflorescence was noted on the interior; however, MH understands that active leaks are present. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	22	Masonry structural components are expected to last the life of the building. A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Maple Hill - Sewage Treatment Building	Sewage Treatment Building	830	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A wood door is present at the main entrance. The door was noted to be in poor condition.	3	3	1990	21-Nov-17	MH	28	30	2	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Maple Hill - Sewage Treatment Building	Sewage Treatment Building	830	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted overhead door is present on the building.	4	4	1990	21-Nov-17	MH	28	30	5	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Maple Hill - Sewage Treatment Building	Sewage Treatment Building	830	B Shell	D30 Roofing	B3010 Roof Coverings	B301002 Low slope Roof Coverings	Roof	1 - 2	The roof consists of a cast-in-place concrete slab. Ongoing water ingress is noted through the roof.	2	2	1990	21-Nov-17	MH	28	25	1	Install a new 2-ply SBS membrane over the roof, install as slope to drain. Water should be collected and drained, to avoid excess water running down the above/below grade walls. Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	150	\$30	SF	\$4,500	0%	5%	5%	\$5,000



Cowichan Valley Regional District

Maple Hill -Sewage Treatment Building - Functional Code 830



Photo 1



Photo 2

## 840 - Shawnigan Beach Sewer

### Infrastructure Condition Assessment and Capital Plan

3065 Gregory Road, Shawnigan Lake, BC

Date Prepared

July 18, 2018

#### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$15,137,098	
Number of Users	377	
Replacement Cost Per User	\$40,151	
Annual Replacement Cost (40 Years)	\$176,366	per year
Annual Replacement Cost (80 Years)	\$186,878	per year
10 Year Capital Plan Total	\$263,000	
10 Year Operations and Maintenance Plan Total	\$310,000	

#### PROPERTY DESCRIPTION

The Shawnigan Beach Sewer System started construction in 1978 and includes the phases outlined in the table below.

Development	Year Installed	Source
Lagoon System (includes Upper Disposal Field)	1978	Innova Report
Robertson Development	1980	Innova Report
Terrace Development	1980	Innova Report
Wildflower	1994	Record Drawings (10808)
Meadowview	1994	Innova Report
Gregory rd. Development	2000	Innova Report
MacFarlane Cres. Development	2006	Innova Report
Ingot Rd Development	2006	Record Drawings (1501-01-16)
Wastewater Treatment Plant Upgrades and Lower Disposal Field	2015	Innova Report

#### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
 Todd Etherington, Utility Operations Superintendent  
 David Parker, Engineering Technologist III  
 Rob Grant, GIS Supervisor  
 Andrea Kross, GIS Technician I  
 Adam Greenwood, Project Engineer  
 Kieran Bertsch, E.I.T.  
 Caleb Light, GIS

#### CONTACT INFORMATION

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## 840 - Shawnigan Beach Sewer

Infrastructure Condition Assessment and Capital Plan

3065 Gregory Road, Shawnigan Lake, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 8, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 4, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 840 - Shawnigan Beach Sewer

Infrastructure Condition Assessment and Capital Plan

3065 Gregory Road, Shawnigan Lake, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4	12	ALL	Capital Upgrade/New	Inspect/assess Robertson lift station for deterioration to determine replacement timing/phasing. Install backup power and a second pump. Upgrade electrical and communications systems.	\$40,000	\$40,000
	5						
	6						
Short Term (2 - 5 Year)	7	5	S-STP-COM-14	Capital Upgrade/New	Upgrade lagoon electrical and communication systems.	\$9,000	\$214,000
	8	6	S-STP-DF-23	Capital Renewal	Increase disposal field capacity depending on outcome of lagoon assessment.	\$100,000	
	9	9	ALL	Capital Upgrade/New	Inspect/assess Meadowview lift station for deterioration to determine replacement timing/phasing. Upgrade electrical and communications systems, and install backup power.	\$35,000	
	10	13	ALL	Capital Upgrade/New	Inspect/assess Terrace lift station for deterioration to determine replacement timing/phasing. Install backup power and upgrade electrical and communications systems.	\$35,000	
	11	14	ALL	Capital Upgrade/New	Inspect/assess Wildflower lift station for deterioration to determine replacement timing/phasing. Install backup power and upgrade electrical and communications systems.	\$35,000	
	12						
Medium Term (5 - 10 Year)	13	6	S-STP-COM-22	Capital Upgrade/New	Upgrade electrical and communication systems for the lower disposal field lift station.	\$9,000	\$9,000
	14						
	15						
						Total	\$263,000

## 840 - Shawnigan Beach Sewer

Infrastructure Condition Assessment and Capital Plan

3065 Gregory Road, Shawnigan Lake, BC

Date Prepared

July 18, 2018

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1	2	S-STP-SL-2	Operations	Further assessment of the storage lagoon is required to identify options to manage/storage wastewater flows. This should include at a minimum a detailed review of sources of I&I and options to reduce/manage peak flows.	\$40,000	\$40,000
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-STP-FL-1	Operations	Review facultative lagoon performance and identify upgrade requirements (ex. sludge curtain).	\$10,000	\$130,000
	8	7	ALL	Maintenance	Rehabilitate field by clearing brush, installing fence, and any other required work.	\$100,000	
	9	10	ALL	Operations	Inspect/assess Gregory Rd lift station for deterioration to determine replacement timing/phasing.	\$10,000	
	10	11	ALL	Operations	Inspect/assess MacFarlane Cres lift station for deterioration to determine replacement timing/phasing.	\$10,000	
	11						
	12						
Medium Term (5 - 10 Year)	13	3	S-STP-SLG-13	Maintenance	Dispose of dried sludge, remove invasive brush and prepare site for future desludging activities.	\$50,000	\$140,000
	14	4	S-STP-STP-3 and S-STP-LS-8	Operations	Inspect/assess wastewater treatment plant and lift station for deterioration to determine replacement timing/phasing.	\$10,000	
	15	8	S-LS-BLD-28	Operations	Inspect/assess Ingot Rd lift station for deterioration to determine replacement timing/phasing.	\$10,000	
	16	15, 16, 17, 21, 29, 36, 39 and 41	As Noted	Operations	Inspect/assess forcemains for deterioration to determine replacement timing/phasing.	\$20,000	
	17	16 to 43	As Noted	Operations	Inspect/assess the collection system for sources of I&I and determine replacement timing/phasing.	\$50,000	
	18						
						Total	\$310,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Coastal Valley Regional District (CVRD)
System:	845 Shalimar Beach Sewer
Site Address:	3065 Gregory rd
Geographic Location:	North of Owenby Lake
Customers:	171
Lot:	277

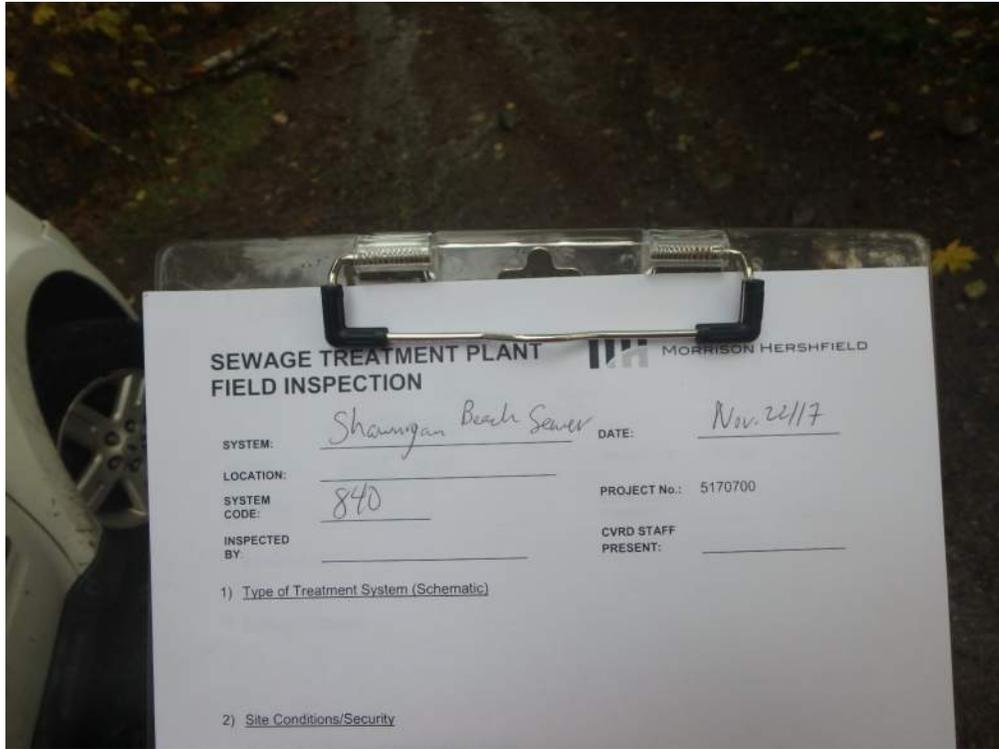
Infrastructure Condition Assessment

Current Year:	2028	Total Replacement Value:	\$13,377,098
		Value per user:	\$40,151

Asset ID	Function Code	Location	Address	Location	DWG Ref	Major	Minor	Spec	Asset Code	Asset Code	Photo	Description	Make	Model	Material	Quantity	Asset Inventory				Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Condition Assessment			Recommendations / Action Items	Type of Work	10 Year Capital Plan Budget Estimate	Timing	Comments/Question to be resolved					
																	Quantity Unit	Year Installed	Year Renewed	Service Life Expectancy					Est. Remaining Service Life	Probability of Failure	Severity of Failure						Condition				
1	840	3065 Gregory rd		Facultative Lagoon	Site Visit / Photos	S	STP	FL	1	S-TP-FL-1	21 to 26	Facultative Lagoon				1	LS	1978			\$1,000,000	\$1,000,000	Fair - some vegetation required	Meets standard	May be a capacity issue. Recently dredged and the addition of a silt curtain will reduce short cutting and improve future desludging operations	3	2	3	Review facultative lagoon performance and identify silt curtain requirements (i.e. silt curtain).	Operations	\$10,000	2.5 Year	CVRD thoughts on approach? Budget amount?				
2	840	3065 Gregory rd		Storage Lagoon	Site Visit / Photos	S	STP	SL	2	S-TP-SL-2	16 to 20, 29 to 42	Storage Lagoon				1	LS	1978			\$1,500,000	\$1,500,000	Poor, old	Does not meet standard	At capacity, water level within 2 feet of top of berm	3	4	1	Further assessment of the storage lagoon is required to identify options to manage/storage wastewater flows. This should include at a minimum a detailed review of sources of I&I and options to reduce/manage peak flows.	Operations	\$40,000	2.5 Year	CVRD thoughts on approach? Budget amount?				
3	840	3065 Gregory rd		Sludge Drying Beds	Site Visit / Photos	S	STP	SLG	13	S-TP-SLG-13	8 to 13	Sludge drying beds				1	LS	1978			\$300,000	\$300,000	Fair, brush growing in and around drying beds	Meets standard	Unable to manage sludge, discoloured ~2 years ago (desludge every 5-7 years)	2	2	4	Dispose of dried sludge, remove invasive brush and prepare site for future desludging activities.	Maintenance	\$50,000	5.50 Year	Sludge disposal cost?				
4	840	3065 Gregory rd		Sewage treatment plant	Site Visit / Photos	S	STP	STP	3	S-TP-STP-3	43 to 58	Sewage treatment plant				1	LS	2015					Refer to Shalimar Beach Sewer System Building Condition Assessment														
4	840	3065 Gregory rd		Sewage treatment plant	Site Visit / Photos	S	STP	PP	4	S-TP-PP-4	43 to 58	Process piping (STP)				1	LS	2015					Good	Meets standard	Ability to manage flows	1	3	4	Inspect assess wastewater treatment plant and lift station for deterioration to determine replacement timing/phasing.	Operations	\$10,000	5.50 Year					
4	840	3065 Gregory rd		Sewage treatment plant	Site Visit / Photos	S	STP	FR	5	S-TP-FR-5	48, 49, 54	Reef screen filter (STP)				1	ea	2015					Good	Meets standard	Meets needs. There is limited material removed during filtration process and therefore the filters do not experience any capacity issues.	1	2	5	Ability to manage flows	1	2	5		5.50 Year			
4	840	3065 Gregory rd		Sewage treatment plant	Site Visit / Photos	S	STP	UV	6	S-TP-UV-6	47, 48, 50, 52	UV treatment filter (STP)				2	ea	2015					Good	Meets standard	Ability to manage flows	1	2	5	Ability to manage flows	1	2	5		5.50 Year			
4	840	3065 Gregory rd		Sewage treatment plant	Site Visit / Photos	S	STP	LS	8	S-TP-LS-8	58	Lift station to pump treatment effluent to disposal field lift stations				1	LS	1978					Good	Meets standard	Ability to manage flows	1	3	4	Inspect assess lift station for deterioration to determine replacement timing/phasing.	Operations	Included above	5.50 Year					
4	840	3065 Gregory rd		Sewage treatment plant	Site Visit / Photos	S	STP	EM	9	S-TP-EM-9	58	Emergency Treatment Effluent Lift Station to Disposal Field Lift Stations				2	ea	1978					Good	Meets standard	Ability to manage flows	1	2	5	Ability to manage flows	1	2	5		5.50 Year			
4	840	3065 Gregory rd		Sewage treatment plant	Site Visit / Photos	S	STP	COM	13	S-TP-COM-13	47, 51, 53	Communications (STP)				1	LS	2015					Good	Meets standard	Ability to control flows	1	2	5	Ability to control flows	1	2	5		5.50 Year			
5	840	3065 Gregory rd		Next to lagoon	Site Visit / Photos	S	STP	STP	12	S-TP-STP-12	14, 15, 80 to 86	Office building				1	LS	1978					Refer to Shalimar Beach Sewer System Building Condition Assessment														
5	840	3065 Gregory rd		Next to lagoon	Site Visit / Photos	S	STP	COM	14	S-TP-COM-14	85	Communications (lagoon operations in old office building)				1	LS	1978						Poor, old	Does not meet standard	Does not have sufficient capacity to efficiently run lagoon operations	3	2	3	Upgrade lagoon electrical and communication systems.	Capital Upgrade/New	\$6,000	2.5 Year				
6	840	3065 Gregory rd		Lower Disposal Field	Site Visit / Photos	S	STP	LS	15	S-TP-LS-15	67, 68	Lower Disposal Field Lift Station				1	LS	2015					Good	Meets standard	Ability to manage flows (although insufficient capacity in disposal field). There is a shut no back generator, however, one can argue no backup in required provided there is sufficient storage at the lagoon.	1	2	3		5.50 Year							
6	840	3065 Gregory rd		Lower Disposal Field	Site Visit / Photos	S	STP	PMP	16	S-TP-PMP-16	67, 68	Pumps in lower disposal field lift station				6	ea	2015					Good	Meets standard	Ability to manage flows (although insufficient capacity in disposal field)	1	2	3		5.50 Year							
6	840	3065 Gregory rd		Lower Disposal Field	Site Visit / Photos	S	STP	COM	22	S-TP-COM-22	69, 70	Communication knock (lower disposal field lift station)				1	ea	2015						Good	Meets standard	PAIR, alarms for failing pumps, no intrusion alarm on cables	2	2	4	Upgrade electrical and communication systems for the lower disposal field lift station.	Capital Upgrade/New	\$9,000	5.50 Year				
6	840	3065 Gregory rd		Lower Disposal Field	Site Visit / Photos	S	STP	DF	23	S-TP-DF-23	60 to 66	Lower disposal field				1	ea	2015					Fair	Does not meet standard	Capacity sufficient to cycle flows through 6 pumps to a separate area	2	2	4	Insufficient capacity	3	2	3	Upgrade electrical and communication systems for the lower disposal field lift station.	Capital Upgrade/New	\$300,000	2.5 Year	CVRD thoughts on approach? Budget amount?
7	840	3065 Gregory rd		Upper drainage field	Site Visit / Photos	S	STP	DF	24	S-TP-DF-24	7 to 6	Upper drainage field				1	ea	1978					Poor	Does not meet standard	Using abandoned field since current disposal field is at capacity	3	2	3	Rehabilitate field by clearing brush, installing fence, and any other required work	Maintenance	\$300,000	2.5 Year	CVRD thoughts on approach to re-instate disposal field? Budget amount?				
7	840	3065 Gregory rd		Upper drainage field	Site Visit / Photos	S	STP	LS	25	S-TP-LS-25	7	Lift Station for Upper Disposal Field				1	ea	1978					Good	Meets standard	Rehabilitate field by clearing brush, installing fence, and any other required work	1	2	3		5.50 Year							
7	840	3065 Gregory rd		Upper drainage field	Site Visit / Photos	S	STP	PMP	26	S-TP-PMP-26	7	Pumps in upper disposal field lift station				1	ea	1978					Good	Meets standard	Rehabilitate field by clearing brush, installing fence, and any other required work	1	2	3		5.50 Year							
7	840	3065 Gregory rd		Upper drainage field	Site Visit / Photos	S	STP	COM	27	S-TP-COM-27	7	Communications (Upper Disposal Field)				1	ea	1978						Good	Meets standard	Rehabilitate field by clearing brush, installing fence, and any other required work	1	2	3		5.50 Year						
8	840	3065 Gregory rd		2178 Ingot Road	Site Visit / Photos	S	LS	BLD	28	S-LS-BLD-28	73 to 79	Lift station (Ingot Rd) (w/ site fencing, access gate)				1	ea	2013					Good	Meets standard	Ability to manage flows	1	1	3	4	Inspect assess Ingot Rd lift station for deterioration to determine replacement timing/phasing.	Operations	\$10,000	5.50 Year				
8	840	3065 Gregory rd		2178 Ingot Road	Site Visit / Photos	S	LS	PMP	29	S-LS-PMP-29	73, 78	Pumps (Ingot rd lift station)				2	ea	2013					Good	Meets standard	Ability to manage flows	1	1	2	5		5.50 Year						
8	840	3065 Gregory rd		2178 Ingot Road	Site Visit / Photos	S	LS	GEN	31	S-LS-GEN-31	73, 74, 77	Generator (Ingot rd lift station)				1	ea	2013					Good	Meets standard	Backup power sufficient	1	2	5		5.50 Year							
8	840	3065 Gregory rd		2178 Ingot Road	Site Visit / Photos	S	LS	COM	32	S-LS-COM-32	73, 75, 76, 79, 70	Communication knock (Ingot rd lift station)				1	ea	2013					Good	Meets standard	Capacity sufficient	1	2	5		5.50 Year							
9	840	3065 Gregory rd		near 2821 Meadowlark Road	Site Visit / Photos	S	LS	BLD	33	S-LS-BLD-33	87 to 93	Lift station (Meadowlark) (w/ site fencing, access gate)				1	ea	1994						Good, fenced and gated, concrete in good shape, Luster	Does not meet standard, no backup power	Ability to manage flows, although lots of I&I due to nearby area	3	3	3	Inspect/Assess Meadowlark lift station for deterioration to determine replacement timing/phasing. Upgrade electrical and communication systems, and install backup power.	Capital Upgrade/New	\$35,000	2.5 Year	scope of I&I issues needs to be identified			
9	840	3065 Gregory rd		near 2821 Meadowlark Road	Site Visit / Photos	S	LS	PMP	34	S-LS-PMP-34	89	Pumps (Meadowlark)				2	ea	1994					Good, original pumps in wet well but new replacement	Meets standard	Ability to manage flows	3	2	3	Inspect assess pumps for deterioration to determine replacement timing/phasing.	Operations	Included above	2.5 Year					
9	840	3065 Gregory rd		near 2821 Meadowlark Road	Site Visit / Photos	S	LS	COM	36	S-LS-COM-36	88, 90, 91 to 95	Communication knock (Meadowlark)				1	ea	1994					Good, old electrical and controls, com out for alarm	Does not meet standard	Requires new technology	3	2	3	Upgrade electrical and communication systems	Capital Upgrade/New	Included above	2.5 Year					
10	840	3065 Gregory rd		near 2882 Gregory Road	Site Visit / Photos	S	LS	BLD	37	S-LS-BLD-37	98 to 112	Lift station (Gregory rd) (w/ site fencing, access gate)				1	ea	2000						Refer to Shalimar Beach Sewer System Building Condition Assessment													
10	840	3065 Gregory rd		near 2882 Gregory Road	Site Visit / Photos	S	LS	WW	38	S-LS-WW-38	98 to 112	Lift station wet well (Gregory rd)				1	ea	2000						Good, fenced and gated, piping needs to be replaced in	Meets standard	Ability to manage flows	2	3	3	Inspect/Assess Gregory rd lift station for deterioration to determine replacement timing/phasing.	Operations	\$30,000	2.5 Year				
10	840	3065 Gregory rd		near 2882 Gregory Road	Site Visit / Photos	S	LS	PMP	39	S-LS-PMP-39	101, 108 to 111	Pumps (Gregory rd)				2	ea	2000						Good, 2 new pumps with VFDs	Meets standard	Ability to manage flows	3	2	3	Inspect/Assess lift station for deterioration to determine replacement timing/phasing.	Operations	Included above	2.5 Year				
10	840	3065 Gregory rd		near 2882 Gregory Road	Site Visit / Photos	S	LS	GEN	41	S-LS-GEN-41	102, 103	Generator (Gregory rd)				1	ea	2000						Good	Meets standard	Sufficient backup power	2	2	4	Inspect/Assess lift station for deterioration to determine replacement timing/phasing.	Operations	Included above	5.50 Year				
10	840	3065 Gregory rd		near 2882 Gregory Road	Site Visit / Photos	S	LS	COM	42	S-LS-COM-42	99 to 100, 104 to 107	Communication knock (Gregory rd)				1	ea	2000						Good, recent upgrade	Meets standard	Ability to control flows	2	2	3	Inspect/Assess lift station for deterioration to determine replacement timing/phasing.	Operations	Included above	2.5 Year				
11	840	3065 Gregory rd		2296 MacFarlane Cres.	Site Visit / Photos	S	LS	BLD	43	S-LS-BLD-43	113 to 118	Lift station (MacFarlane cres) (w/ site fencing, access gate)				1	ea	2000						Good, fenced and gated	Meets standard	Ability to manage flows	2	3	3	Inspect/Assess MacFarlane lift station for deterioration to determine replacement timing/phasing.	Operations	\$30,000	2.5 Year				
11	840	3065 Gregory rd		2296 MacFarlane Cres.	Site Visit / Photos	S	LS	PMP	44	S-LS-PMP-44	118	Pumps (MacFarlane cres)				2	ea	2000					Good	Meets standard	Ability to manage flows	3	2	3	Inspect/Assess lift station for deterioration to determine replacement timing/phasing.	Operations	Included above	2.5 Year					
11	840	3065 Gregory rd		2296 MacFarlane Cres.	Site Visit / Photos	S	LS	GEN	46	S-LS-GEN-46	115 to 117	Generator (MacFarlane cres)				1	ea	2000					Good	Meets standard	Sufficient backup power	2	2	4	Inspect/Assess lift station for deterioration to determine replacement timing/phasing.	Operations	Included above	5.50 Year					
11	840	3065 Gregory rd		2296 MacFarlane Cres.	Site Visit / Photos	S	LS	COM	47	S-LS-COM-47	115 to 117	Communication knock (MacFarlane cres)				1	ea	2000					Good	Meets standard	Ability to control flows	3	2	3	Inspect/Assess lift station for deterioration to determine replacement timing/phasing.	Operations	Included above	2.5 Year					
12	840	3065 Gregory rd			Site Visit / Photos	S	LS	BLD	48	S-LS-BLD-48	119 to 126	Lift station (Robertson)				1	ea	2000						Poor, challenging access, exposed, spilt, painted, next to (small service area)	Does not meet standard, no backup power or 24hr	Ability to manage flows (can be off-line for 24 hours due to small service area)	4	3	2	Inspect/Assess Robertson lift station for deterioration to determine replacement timing/phasing. Install backup power and a second pump. Upgrade electrical and communication systems.	Capital Upgrade/New	\$40,000	1.2 Year				
12	840	3065 Gregory rd		near 2389 Robertson Rd	Site Visit / Photos	S	LS	PMP	49	S-LS-PMP-49	122, 126	Pumps (Robertson)				1	ea	2000						Fair, only one pump installed (no redundancy)	Does not meet standard	Install second pump in the lift station	1	4	2		5.50 Year						
12	840	3065 Gregory rd		near 2389 Robertson Rd	Site Visit / Photos	S	LS	COM	50	S-LS-COM-50	122, 123, 125	Communication knock (Robertson)				1	ea	2000						Poor, old, no enclosure	Does not meet standard	Requires new technology	3	2	3	Upgrade electrical and communication systems							

33	B40	3063 Gregory rd	MUSGETT ROAD	GIS	5	SS	5	93	S-SS-S-93				156	m	1979		80	41	\$500	\$78,035				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
34	B40	3063 Gregory rd	PARK PLACE	GIS	5	SS	5	94	S-SS-S-94				45	m	1979		80	41	\$500	\$24,574				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
35	B40	3063 Gregory rd	SILVERHILL ROAD	GIS	5	SS	5	95	S-SS-S-95				632	m	1979		80	41	\$550	\$347,600				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
36	B40	3063 Gregory rd	ROBERTSON ROAD	GIS	5	FM	PP	96	S-FM-PP-96				140	m	1979		80	41	\$500	\$70,000				2	3	3	Inspect/assess for remains for deterioration to determine replacement timing/quantity.	Operations	Included in \$20,000	5-5 Year
36	B40	3063 Gregory rd	ROBERTSON ROAD	GIS	5	SS	5	97	S-SS-S-97				209	m	1979		80	41	\$550	\$116,719				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
37	B40	3063 Gregory rd	SAN JUAN PLACE	GIS	5	SS	5	98	S-SS-S-98				77	m	1979		80	41	\$500	\$41,201				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
38	B40	3063 Gregory rd	SKIRNISHIRE ROAD	GIS	5	SS	5	99	S-SS-S-99				116	m	1979		80	41	\$500	\$64,050				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
39	B40	3063 Gregory rd	TERRACE ROAD	GIS	5	FM	PP	100	S-FM-PP-100				51	m	1979		80	41	\$500	\$25,500				2	3	3	Inspect/assess for remains for deterioration to determine replacement timing/quantity.	Operations	Included in \$20,000	5-5 Year
39	B40	3063 Gregory rd	TERRACE ROAD	GIS	5	SS	5	101	S-SS-S-101				680	m	1979		80	41	\$550	\$373,044				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
40	B40	3063 Gregory rd	WARD ROAD	GIS	5	SS	5	102	S-SS-S-102				55	m	1979		80	41	\$500	\$29,207				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
41	B40	3063 Gregory rd	WILDFLOWER ROAD	GIS	5	FM	PP	103	S-FM-PP-103				365	m	1979		80	41	\$500	\$117,360				2	3	3	Inspect/assess for remains for deterioration to determine replacement timing/quantity.	Operations	Included in \$20,000	5-5 Year
41	B40	3063 Gregory rd	WILDFLOWER ROAD	GIS	5	SS	5	104	S-SS-S-104				77	m	1979		80	41	\$500	\$42,479				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
42	B40	3063 Gregory rd	UNKNOWN ROAD	GIS	5	SS	5	105	S-SS-S-105				327	m	1979		80	41	\$500	\$160,120				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
43	B40	3063 Gregory rd	Entire system	GIS	5	SS	10	106	S-SS-S-106				379	m	1979		80	41	\$3,000	\$1,197,000				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year
43	B40	3063 Gregory rd	Entire system	GIS	5	SS	10	107	S-SS-S-107				119	m	1979		40	5	\$8,000	\$952,000				2	2	4	Inspect/assess the collection system for sources of I&I and determine replacement timing/quantity.	Operations	Included above	5-10 Year

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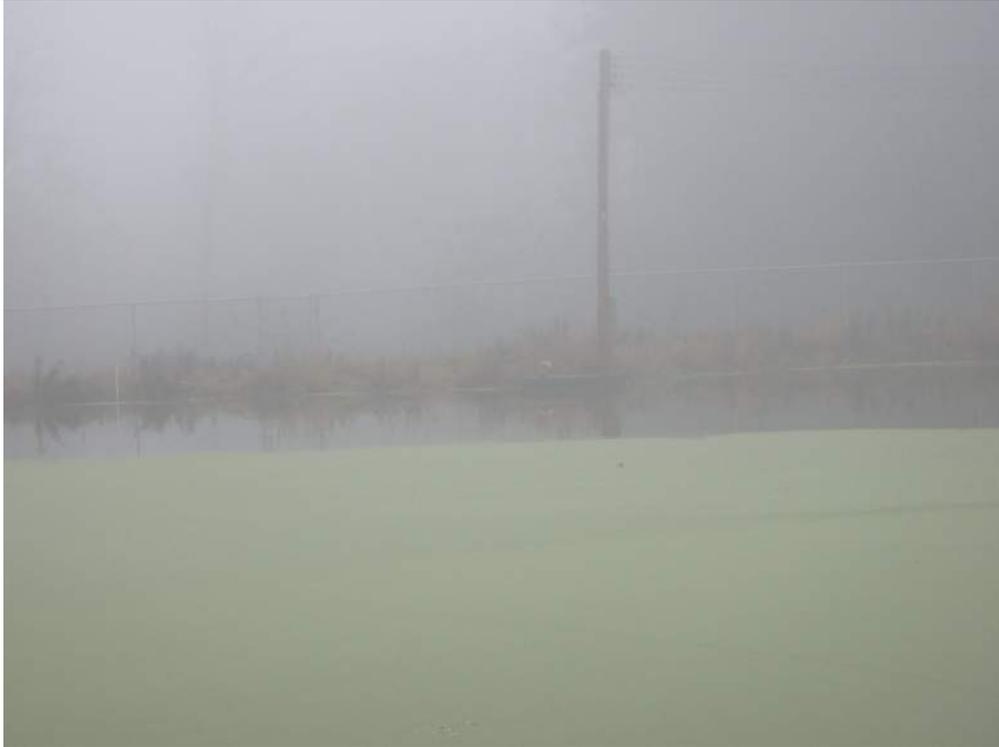


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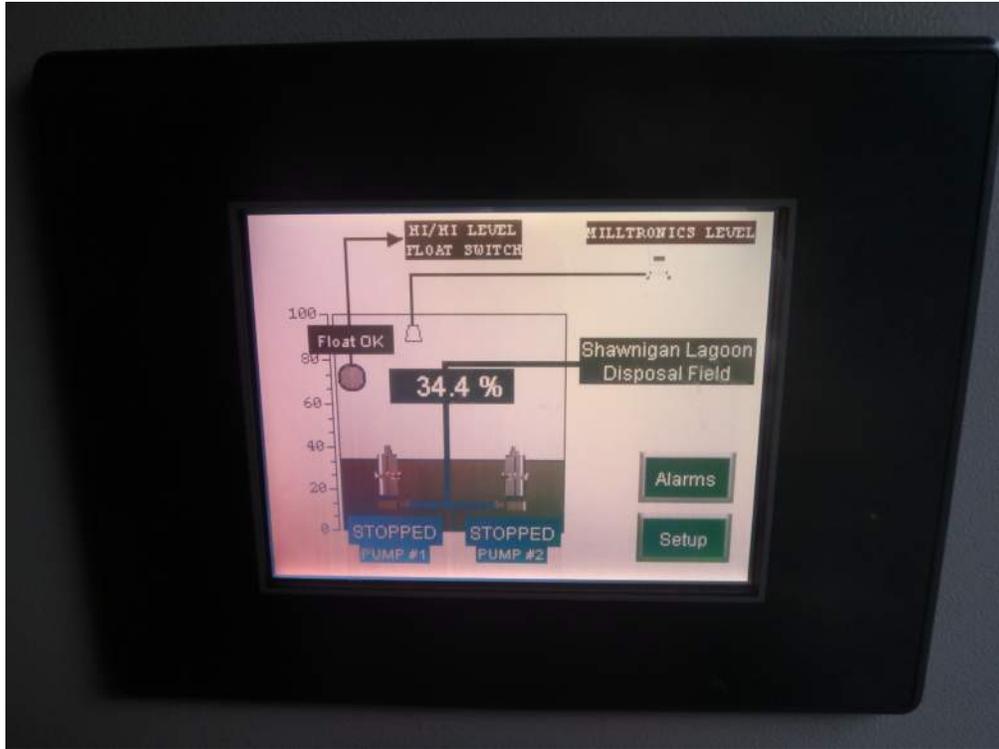


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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Shawinigan Beach - Lift Station - Functional Code 840**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOQ or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Shawinigan Beach - Lift Station	Sewage Building	840	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the building was not confirmed and has been assumed. The small open shed adjacent to the building has not been included.	4	4	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$20	SF	\$1,000	0%	5%	5%	\$2,000
Shawinigan Beach - Lift Station	Sewage Building	840	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$10	SF	\$500	0%	5%	5%	\$1,000
Shawinigan Beach - Lift Station	Sewage Building	840	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2010	21-Nov-17	MH	8	50	42	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$40	SF	\$2,000	0%	5%	5%	\$3,000
Shawinigan Beach - Lift Station	Sewage Building	840	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2010	21-Nov-17	MH	8	12	7	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	160	\$8	SF	\$1,280	0%	15%	5%	\$2,000
Shawinigan Beach - Lift Station	Sewage Building	840	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2010	21-Nov-17	MH	8	50	42	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	160	\$35	SF	\$5,600	0%	5%	5%	\$7,000
Shawinigan Beach - Lift Station	Sewage Building	840	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	40	\$20	SF	\$800	0%	10%	5%	\$1,000
Shawinigan Beach - Lift Station	Sewage Building	840	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A painted metal door is present on the building.	4	4	2010	21-Nov-17	MH	8	30	22	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000
Shawinigan Beach - Lift Station	Sewage Building	840	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2010	21-Nov-17	MH	8	40	32	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	50	\$30	SF	\$1,500	0%	5%	5%	\$2,000
Shawinigan Beach - Lift Station	Sewage Building	840	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2010	21-Nov-17	MH	8	25	17	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	10	\$10	SF	\$100	0%	10%	5%	\$1,000
Shawinigan Beach - Lift Station	Sewage Building	840	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2010	21-Nov-17	MH	8	20	12	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



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Cowichan Valley Regional District

Shawnigan Beach - Lift Station - Functional Code 840



Photo 1

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Shawinigan Beach - Office Building - Functional Code 840**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr. New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Contingency	5% Tax	Total in 2017 Dollars	
Shawinigan Beach - Office Building	Office Building	840	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the building was not reported and has been assumed.	4	4	1990	21-Nov-17	MH	28	50	22	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$20	SF	\$8,000	0%	5%	5%	\$9,000
Shawinigan Beach - Office Building	Office Building	840	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade, various flooring was in place over the slab. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	22	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$10	SF	\$4,000	0%	5%	5%	\$5,000
Shawinigan Beach - Office Building	Office Building	840	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	22	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$40	SF	\$16,000	0%	5%	5%	\$18,000
Shawinigan Beach - Office Building	Office Building	840	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	12	3	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	700	\$8	SF	\$5,600	0%	15%	5%	\$7,000
Shawinigan Beach - Office Building	Office Building	840	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	50	22	The siding is expected to last the life of the building.  Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	700	\$35	SF	\$24,500	0%	5%	5%	\$28,000
Shawinigan Beach - Office Building	Water Treatment Building	601	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	1990	21-Nov-17	MH	28	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$20	SF	\$3,600	0%	10%	5%	\$5,000
Shawinigan Beach - Office Building	Water Treatment Building	601	B Shell	CB20 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Windows	1	Metal framed windows are present throughout the building.	3	3	1990	21-Nov-17	MH	28	30	2	Replace windows at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	7	\$200	EA	\$1,400	0%	10%	5%	\$2,000
Shawinigan Beach - Office Building	Water Treatment Building	601	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Wood core doors are present throughout the building.	4	4	1990	21-Nov-17	MH	28	30	2	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$500	EA	\$1,000	0%	5%	5%	\$2,000
Shawinigan Beach - Office Building	Water Treatment Building	601	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with asphalt shingles. A lower sloped roof overhang is present at the rear, it is assumed that this roof has a sheet style membrane installed.  The roof drains via aluminum gutters to rain water leaders.	4	4	1990	21-Nov-17	MH	28	25	2	Replace the roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	400	\$10	SF	\$4,000	0%	5%	5%	\$5,000
Shawinigan Beach - Office Building	Water Treatment Building	601	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with asphalt shingles. A lower sloped roof overhang is present at the rear, it is assumed that this roof has a sheet style membrane installed.  The roof drains via aluminum gutters to rain water leaders.	4	4	1990	21-Nov-17	MH	28	25	1	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	80	\$10	SF	\$800	0%	10%	5%	\$1,000
Shawinigan Beach - Office Building	Water Treatment Building	601	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum walls and ceilings are painted.	4	4	1990	21-Nov-17	MH	28	20	13	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Shawinigan Beach - Office Building	Water Treatment Building	601	C Interiors	C30 Interior Finishes	C3020 Floor Finishes	C302099 Other Flooring and Floor Finishes	Interior/Interior Finishes	2	The interior gypsum walls and ceilings are painted.	4	4	1990	21-Nov-17	MH	28	20	5	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	400	\$10	SF	\$4,000	0%	0%	5%	\$5,000
Shawinigan Beach - Office Building	Water Treatment Building	601	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	1990	21-Nov-17	MH	28	20	2	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Shawigan Beach - Office Building - Functional Code 840

BLDD Name	BLDD Type	Function Code	Level 1 Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT										LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST										10-YEAR CAPITAL PLAN												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027				
																																	\$1,000	\$10,000	\$700	\$0	\$5,000	\$0	\$0	\$0	\$0	\$0	\$0			
Shawigan Beach - Office Building	Office Building	840	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations.  The age of the building was not reported and has been assumed.	4	4	1990	21-Nov-17	MH	28	50	22	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$20	SF	\$8,000	0%	5%	5%	\$9,000													
Shawigan Beach - Office Building	Office Building	840	A Substructure	A10 Foundations	A1010 Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade, various flooring was in place over the slab. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	22	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$10	SF	\$4,000	0%	5%	5%	\$5,000													
Shawigan Beach - Office Building	Office Building	840	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	22	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$40	SF	\$16,000	0%	5%	5%	\$18,000													
Shawigan Beach - Office Building	Office Building	840	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding		1	Painted wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	12	3	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	700	\$8	SF	\$5,600	0%	15%	5%	\$7,000													
Shawigan Beach - Office Building	Office Building	840	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	50	22	The siding is expected to last the life of the building.  Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	700	\$35	SF	\$24,500	0%	5%	5%	\$28,000													
Shawigan Beach - Office Building	Water Treatment Building	601	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit		1	Perforated metal soffit is present at the roof overhangs.	4	4	1990	21-Nov-17	MH	28	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$20	SF	\$3,600	0%	10%	5%	\$5,000													
Shawigan Beach - Office Building	Water Treatment Building	601	B Shell	B20 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Windows		1	Metal framed windows are present throughout the building.	3	3	1990	21-Nov-17	MH	28	30	2	Replace windows at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	7	\$200	EA	\$1,400	0%	10%	5%	\$2,000													
Shawigan Beach - Office Building	Water Treatment Building	601	B Shell	B20 Enclosure	E2030 Exterior Doors	E203001 Solid Doors	Exterior Walls/ Door		1	Wood core doors are present throughout the building.	4	4	1990	21-Nov-17	MH	28	30	2	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$500	EA	\$1,000	0%	5%	5%	\$2,000													
Shawigan Beach - Office Building	Water Treatment Building	601	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped assembly with asphalt shingles. A lower sloped roof overhang is present at the rear, it is assumed that this roof has a sheet style membrane installed.  The roof drains via aluminum gutters to rain water leaders.	4	4	1990	21-Nov-17	MH	28	25	2	Replace the roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	400	\$10	SF	\$4,000	0%	5%	5%	\$5,000													
Shawigan Beach - Office Building	Water Treatment Building	601	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped assembly with asphalt shingles. A lower sloped roof overhang is present at the rear, it is assumed that this roof has a sheet style membrane installed.  The roof drains via aluminum gutters to rain water leaders.	4	4	1990	21-Nov-17	MH	28	25	1	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	80	\$10	SF	\$800	0%	10%	5%	\$1,000	\$1,000												
Shawigan Beach - Office Building	Water Treatment Building	601	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		2	The interior gypsum walls and ceilings are painted.	4	4	1990	21-Nov-17	MH	28	20	13	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000													
Shawigan Beach - Office Building	Water Treatment Building	601	C Interiors	C30 Interior Finishes	C3020 Floor Finishes	C302099 Other Flooring and Floor Finishes	Interior/Interior Finishes		2	The interior gypsum walls and ceilings are painted.	4	4	1990	21-Nov-17	MH	28	20	5	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	400	\$10	SF	\$4,000	0%	0%	5%	\$5,000													
Shawigan Beach - Office Building	Water Treatment Building	601	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	4	4	1990	21-Nov-17	MH	28	20	2	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000													

Cowichan Valley Regional District

hawnigan Beach - Office Building - Functional Code 840



Photo 1



Photo 2

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Shawnigan Beach - Sewage Treatment Plant - Functional Code 840

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Shawnigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the building was not confirmed and has been assumed.	4	4	2000	21-Nov-17	MH	18	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	620	\$20	SF	\$12,400	0%	10%	5%	\$15,000
Shawnigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2000	21-Nov-17	MH	18	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	620	\$10	SF	\$6,200	0%	10%	5%	\$8,000
Shawnigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks with a wood framed ceiling. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2000	21-Nov-17	MH	18	50	32	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Shawnigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements	1	Wood cladding and wood trim (included roof framing) is present through sections of the building. The wood cladding sections appear to be retrofit areas. Some deterioration was noted in these elements.	3	3	2000	21-Nov-17	MH	18	12	2	Repaint wood cladding, install flashing over exposed wood roof framing.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	10%	5%	\$2,000
Shawnigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A painted metal door is present on the building.	4	4	2000	21-Nov-17	MH	18	30	12	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Shawnigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1	The roof is sloped assembly which has been waterproofed with a metal roof assembly. The roof drains via aluminum gutters to rain water leaders. Section of detached roof were noted.	4	4	2000	21-Nov-17	MH	18	40	1	Repair detached sections of roof.  Ongoing maintenance of the roof should include review of all penetrations when required.	Repair Allowance	3 - Future Renewal	No	Yes	No	No	1	\$1,500	LS	\$1,500	0%	5%	5%	\$2,000
Shawnigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1	The roof is sloped assembly which has been waterproofed with a metal roof assembly. The roof drains via aluminum gutters to rain water leaders. Section of detached roof were noted.	4	4	2000	21-Nov-17	MH	18	40	22	Replace metal roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	Yes	Yes	No	No	650	\$20	SF	\$13,000	0%	10%	5%	\$16,000
Shawnigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2000	21-Nov-17	MH	18	20	2	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Shawigan Beach - Sewage Treatment Plant - Functional Code 840

BUD Name	BUD Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT						LIFECYCLE DATA				RECOMMENDATION			OPINION OF PROBABLE COST								10-YEAR CAPITAL PLAN															
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work is complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027			
Shawigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations. The age of the building was not confirmed and has been assumed.	4	4	2000	21-Nov-17	MH	18	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	620	\$20	SF	\$12,400	0%	10%	5%	\$15,000	\$3,000	\$2,000	\$0	\$0	\$4,000	\$0	\$0	\$0	\$0	\$0	\$1,000	
Shawigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2000	21-Nov-17	MH	18	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	620	\$10	SF	\$6,200	0%	10%	5%	\$8,000												
Shawigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of masonry blocks with a wood framed ceiling. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2000	21-Nov-17	MH	18	50	32	Masonry structural components are expected to last the life of the building. A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the window block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000												
Shawigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements		1	Wood cladding and wood trim (included roof framing) is present through sections of the building. The wood cladding sections appear to be retrofit areas. Some deterioration was noted in these elements.	3	3	2000	21-Nov-17	MH	18	12	2	Repair wood cladding, install flashing over exposed wood roof framing.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	10%	5%	\$2,000	\$2,000											
Shawigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	B20 Exterior Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Wall/ Door		1	A painted metal door is present on the building.	4	4	2000	21-Nov-17	MH	18	30	12	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000					\$4,000							
Shawigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly		1	The roof is sloped assembly which has been waterproofed with a metal roof assembly. The roof drains via aluminum gutters to rain water leaders. Section of detached roof were noted.	4	4	2000	21-Nov-17	MH	18	40	1	Repair detached sections of roof. Ongoing maintenance of the roof should include review of all penetrations when required.	Repair Allowance	3 - Future Renewal	No	Yes	No	No	1	\$1,500	LS	\$1,500	0%	5%	5%	\$2,000	\$2,000											
Shawigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly		1	The roof is sloped assembly which has been waterproofed with a metal roof assembly. The roof drains via aluminum gutters to rain water leaders. Section of detached roof were noted.	4	4	2000	21-Nov-17	MH	18	40	22	Replace metal roofing at the end of its service life. Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	Yes	Yes	No	No	650	\$20	SF	\$13,000	0%	10%	5%	\$16,000												
Shawigan Beach - Sewage Treatment Plant	Sewage Treatment Plant	840	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		1	An exterior light is present on the building near the entrance.	4	4	2000	21-Nov-17	MH	18	20	2	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000	\$1,000										\$1,000	

Cowichan Valley Regional District

Shawnigan Beach - Sewage Treatment Plant - Functional Code 840



Photo 1



Photo 2



## 850 - Kerry Village Sewer

Infrastructure Condition Assessment and Capital Plan  
1070 Waterman Road, Mill Bay, BC

Date Prepared July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 2, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 4, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 850 - Kerry Village Sewer

Infrastructure Condition Assessment and Capital Plan  
1070 Waterman Road, Mill Bay, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4	2	S-STP-UV-25	Capital Upgrade/New	Replace UV units with proper wastewater UV units in wastewater treatment plant.	\$50,000	\$50,000
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$50,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-STP-STP-2	Operations	Inspect/assess RBC wastewater treatment unit for deterioration to determine replacement timing/phasing.	\$10,000	\$10,000
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	2	ALL	Operations	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phasing.	\$10,000	\$110,000
	14	3	S-STP-DF-26	Operations	Inspect/assess RIB for deterioration to determine replacement timing/phasing.	\$10,000	
	15	4	ALL	Operations	Inspect/assess lift station for deterioration to determine replacement timing/phasing.	\$10,000	
	16	5 to 11, 14, and 17 to 21	As Noted	Operations	Inspect/assess forcemains for deterioration to determine replacement timing/phasing.	\$60,000	
	17	11 to 22	As Noted	Operations	Inspect/assess collection system for deterioration to determine replacement timing/phasing.	\$20,000	
	18						
						Total	\$120,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Lowchen Valley Regional District (LRD)
System:	SRV Sewer Village Sewer
Site Address:	1070 Waterman Road
Geographic Location:	West of Mill Bay
City/Town:	Port Moody
UICN:	97

Infrastructure Condition Assessment

Asset ID	Function Code	ASSET	Address	Location	DNV Ref	Asset Code		Photo	Description	Make	Model	Material	Asset Inventory	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Condition Assessment			Recommendations / Action Items	Type of Work	Est. Cost	Est. Start	Comments/Notes to be included
						Major	Minor															Severity	Probability of Failure	Severity of Failure					
1	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	STP-1	22 to 27, 39				1	ea	2010		40	32	Refer to Sewerage System Building Condition Assessment	Refer to Sewerage System Building Condition Assessment	Meets standard	2	2	3	Inspect/assess PVC wastewater treatment unit for deterioration to determine replacement timing/phase.	Operations	\$10,000	2-5 Year	
1	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	STP-2	22 to 27, 39			1	ea	2010		40	32	\$100,000	\$100,000	2" - Inlet sewer (problem for gravity system)	Does not meet standard	2	2	3	Inspect/assess PVC wastewater treatment unit for deterioration to determine replacement timing/phase.	Operations	\$10,000	2-5 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	STP-3	6 to 17, 20V 1			1	ea	2010		40	32	Refer to Sewerage System Building Condition Assessment	Refer to Sewerage System Building Condition Assessment	Meets standard	2	2	4	lots of operational challenges, sensitive to changing conditions	Operations	\$10,000	5-10 Year		
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	ET-4	15, 20, 28 to 32, 34			1	ea	2010		40	32	\$150,000	\$150,000	Steel tank for treatment with separate compartments for: sludge pre-thickener, blower, anaerobic mixer, filter feed tank	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	\$10,000	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	FR-5	S-STP-FR-5			1	ea	2010		40	32	\$100,000	\$100,000	Influent basket screen, 12mm	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	ET-6	23 to 26			1	ea	2010		40	32	\$150,000	\$150,000	Equalization tank (in MEC building)	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	PM-7	S-STP-PM-7			2	ea	2010		30	12	\$5,000	\$10,000	Pumps, equalization pump, 3.8 kW @ 6m, 3.0kW @ 2.0m, 2.3kW @ 1.0m	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	AM-9	S-STP-AM-9	28 to 32		1	ea	2010		20	12	\$20,000	\$20,000	Anaerobic mixer, 200mm, 0.9 kW @ 2.0m, 2.0kW @ 1.0m	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	FR-10	S-STP-FR-10			1	ea	2010		20	12	\$150,000	\$150,000	Sludge blanket filter, 95 m <sup>2</sup> @ 2.0m, 2.0m @ 1.0m	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	ET-11	S-STP-ET-11			1	ea	2010		40	32	\$40,000	\$40,000	Fiber filter tank, 8 m <sup>3</sup>	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	PM-12	S-STP-PM-12			2	ea	2010		20	12	\$5,000	\$10,000	Filter feed pump, 3.8kW @ 2.0m, 2.0kW @ 1.0m	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	PM-14	S-STP-PM-14			2	ea	2010		20	12	\$5,000	\$10,000	Fiber backwash pump, 3.8kW @ 2.0m, 2.0kW @ 1.0m	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	ET-15	S-STP-ET-15			1	ea	2010		40	32	\$40,000	\$40,000	Treated effluent tank, 10m <sup>3</sup>	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	PM-16	S-STP-PM-16			2	ea	2010		30	12	\$5,000	\$10,000	Influent pump, 4.2 kW @ 5m, 6.0kW, 7.5 kW, 2.0kW @ 1.0m	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	ET-18	S-STP-ET-18			1	ea	2010		40	32	\$40,000	\$40,000	Sludge holding tank	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	CO-19	S-STP-CO-19			1	ea	2010		40	32	\$20,000	\$20,000	Sludge pre-thickener	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	09175-201	S	STP	PM-20	S-STP-PM-20			1	ea	2010		20	12	\$5,000	\$10,000	Sludge pre-thickener pump, 4.2 kW @ 5m, 6.0kW, 7.5 kW, 2.0kW @ 1.0m	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	CO-21	S-STP-CO-21	11, 12, 16, 17		1	ea	2010		10	2	\$20,000	\$20,000	Communications (STP)	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	GEN-22	S-STP-GEN-22	20, 21		1	ea	2010		40	32	\$40,000	\$40,000	Generator (STP)	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	FR-23	S-STP-FR-23	22		1	ea	2014		20	16	\$30,000	\$30,000	Peristaltic control system (from anaerobic tank)	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	PM-24	S-STP-PM-24	5, 10, 14, 15, 28 to 32, 34		1	ea	2010		40	32	\$10,000	\$10,000	Process piping (c/w pipes, valves, tees)	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
2	850	1070 Waterman Road	Waterman rd STP	Waterman rd STP	1584-01_STP	S	STP	UV-25	S-STP-UV-25	9, 20, 21, 25 to 27		1	ea	2010		20	12	\$15,000	\$15,000	UV treatment unit	Meets standard	2	2	4	Inspect/assess wastewater treatment plant for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
3	850	1070 Waterman Road	Waterman rd	Waterman rd	1584-01_RR	S	STP	OP-26	S-STP-OP-26	1 to 4		2	ea	2011		60	53	\$30,000	\$30,000	Rapid infiltration basin (c/w valves, process piping)	Meets standard	2	2	4	Inspect/assess basin for deterioration to determine replacement timing/phase.	Operations	\$10,000	5-10 Year	
4	850	1070 Waterman Road	Ferry park rec centre (RR station)	Ferry park rec centre (RR station)	121-2282-01	S	RR	SL-27	S-RR-SL-27	41 to 44		1	ea	2015		40	37	\$50,000	\$50,000	Good - Annual in rec centre site	Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	\$10,000	5-10 Year	
4	850	1070 Waterman Road	Ferry park rec centre (RR station)	Ferry park rec centre (RR station)	121-2282-01	S	RR	SL-28	S-RR-SL-28	41, 42		2	ea	2015		20	17	\$10,000	\$20,000	Good - Annual in rec centre site	Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
4	850	1070 Waterman Road	Ferry park rec centre (RR station)	Ferry park rec centre (RR station)	121-2282-01	S	RR	CO-29	S-RR-CO-29	41 to 44		1	ea	2015		10	7	\$5,000	\$5,000	Communications (RR)	Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
4	850	1070 Waterman Road	Ferry park rec centre (RR station)	Ferry park rec centre (RR station)	121-2282-01	S	RR	SL-30	S-RR-SL-30	41		1	ea	2015		40	37	\$10,000	\$10,000	Process piping (c/w pipes, valves, tees)	Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
4	850	1070 Waterman Road	Ferry park rec centre (RR station)	Ferry park rec centre (RR station)	121-2282-01	S	RR	PM-31	S-RR-PM-31	41, 42		1	ea	2015		20	17	\$10,000	\$10,000	Flow meter (c/w chamber)	Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
4	850	1070 Waterman Road	Ferry park rec centre (RR station)	Ferry park rec centre (RR station)	121-2282-01	S	RR	GEN-32	S-RR-GEN-32	41, 42, 46		1	ea	2015		40	37	\$40,000	\$40,000	Generator, 37 kW, propane powered (IG)	Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included above	5-10 Year	
5	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-33	S-RR-PM-33			1	ea	2011		80	73	\$400	\$10,000		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	\$10,000	5-10 Year	
5	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-34	S-RR-PM-34			1	ea	2011		80	73	\$400	\$10,000		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
5	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-35	S-RR-PM-35			1	ea	2011		80	73	\$400	\$10,000		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
5	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-36	S-RR-PM-36			1	ea	2011		80	73	\$400	\$10,000		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
6	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-37	S-RR-PM-37			1	ea	2011		80	77	\$400	\$15,700		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
6	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-38	S-RR-PM-38			1	ea	2011		80	77	\$400	\$10,000		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
6	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-39	S-RR-PM-39			1	ea	2015		40	37	\$5,000	\$5,000		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
7	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	CO-40	S-RR-CO-40			1	ea	2011		30	23	\$1,000	\$1,000		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
8	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-41	S-RR-PM-41			1	ea	2015		80	77	\$400	\$174,500		Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
8	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	VAL-42	S-RR-VAL-42			1	ea	2015		40	37	\$15,000	\$15,000	Air valve assembly (c/w valves, pipes, chamber)	Meets standard	2	2	4	Inspect/assess RR station for deterioration to determine replacement timing/phase.	Operations	Included in 500,000	5-10 Year	
9	850	1070 Waterman Road	Stranmillis rd 1-1312	Stranmillis rd 1-1312	1581-01	S	RR	PM-43	S-RR-PM-43			1																	

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**LIFT STATION**  
**FIELD INSPECTION**

SYSTEM: Kerry Village Sewer DATE: Nov. 22/17  
SYSTEM CODE: 850 PROJECT No.: 5170700  
INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Site Conditions

2) Building Conditions

3) Condition of wet well:  
Visible Deterioration of structure and hatch:

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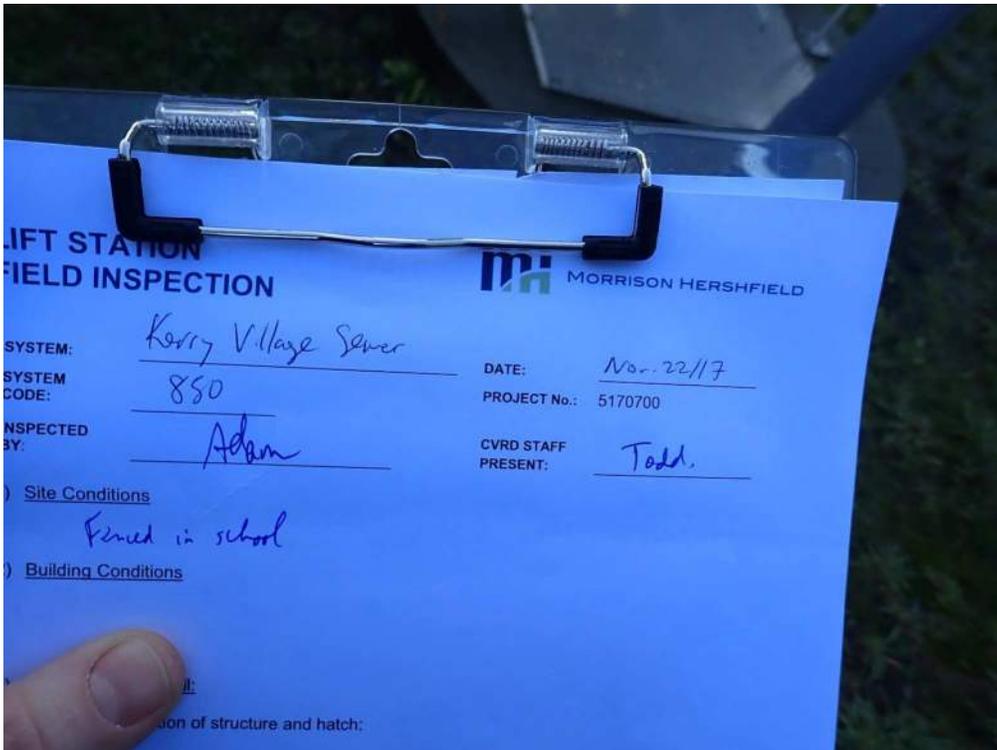


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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Kerry Village - Lift Station - Functional Code 850**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	OPINION OF PROBABLE COST										
						ID	Location / Type		Description & History	Condition	Performance	Yr New or Last Major Action	Measurement Date	Assessed By	Age in 2018	Typical Life Span or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation					Type	Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars	
Kerry Village - Lift Station	Lift Station	850	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2014	21-Nov-17	MH	4	50	46	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$20	SF	\$2,000	0%	5%	5%	\$3,000
Kerry Village - Lift Station	Lift Station	850	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2014	21-Nov-17	MH	4	50	46	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$10	SF	\$1,000	0%	5%	5%	\$2,000
Kerry Village - Lift Station	Lift Station	850	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of masonry blocks with a wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2014	21-Nov-17	MH	4	50	46	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Kerry Village - Lift Station	Lift Station	850	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of masonry blocks with a wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  The masonry blocks have been painted.	4	4	2014	21-Nov-17	MH	4	12	8	Repaint masonry blocks.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Kerry Village - Lift Station	Lift Station	850	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements		1	Wood cladding and wood trim (included roof framing) is present through sections of the building. The wood cladding sections appear to be retrofit areas. Some deterioration was noted in these elements.	4	4	2014	21-Nov-17	MH	4	12	8	Repaint wood cladding, install flashing over exposed wood roof framing.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	10%	5%	\$2,000
Kerry Village - Lift Station	Lift Station	850	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	A painted metal door (double door) is present on the building.	4	4	2014	21-Nov-17	MH	4	30	26	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Kerry Village - Lift Station	Lift Station	850	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly		1	The roof is sloped assembly which has been waterproofed with a metal roof assembly.  The roof is edge drained.	4	4	2014	21-Nov-17	MH	4	30	26	Replace metal roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	110	\$30	SF	\$3,300	0%	5%	5%	\$4,000
Kerry Village - Lift Station	Lift Station	850	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	4	4	2014	21-Nov-17	MH	4	20	16	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Kerry Village - Lift Station - Functional Code 850



Photo 1



Photo 2

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Kerry Village - Water Treatment Building - Functional Code 850

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical U/L Repair or Action Interval	Est. Yr. Remaining to EOJ or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Kerry Village - Water Treatment Building	Water Treatment Building	850	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$20	SF	\$12,000	0%	5%	5%	\$14,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$10	SF	\$6,000	0%	5%	5%	\$7,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2010	21-Nov-17	MH	8	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2010	21-Nov-17	MH	8	50	42	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3- Future Renewal	N/A	N/A	No	No								
Kerry Village - Water Treatment Building	Water Treatment Building	850	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2010	21-Nov-17	MH	8	50	42	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$40	SF	\$24,000	0%	5%	5%	\$27,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2010	21-Nov-17	MH	8	12	7	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3- Future Renewal	Yes	Yes	No	No	550	\$7	SF	\$3,850	0%	15%	5%	\$5,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2010	21-Nov-17	MH	8	50	42	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3- Future Renewal	Yes	Yes	No	No	550	\$35	SF	\$19,250	0%	5%	5%	\$22,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3- Future Renewal	Yes	Yes	No	No	100	\$20	SF	\$2,000	0%	10%	5%	\$3,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A painted metal door (double swing) is present on the building.	5	5	2010	21-Nov-17	MH	8	30	22	Replace doors at the end of their service life.	Replacement	3- Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with asphalt shingles installed.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2010	21-Nov-17	MH	8	25	17	Replace the roof assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3- Future Renewal	No	Yes	No	No	650	\$30	SF	\$19,500	0%	5%	5%	\$22,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with asphalt shingles installed.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2010	21-Nov-17	MH	8	25	17	Replace gutters at the end of their service life.	Replacement	3- Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2010	21-Nov-17	MH	8	20	12	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3- Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Kerry Village - Water Treatment Building	Water Treatment Building	850	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	12	Replace lights at the end of their service life.	Replacement	3- Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Kerry Village - Water Treatment Building - Functional Code 850



Photo 1



Photo 2



## 860 - Youbou Sewer

Infrastructure Condition Assessment and Capital Plan

9385 Youbou Road, Youbou, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 8, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
July 4, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management seperately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create seperate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 860 - Youbou Sewer

Infrastructure Condition Assessment and Capital Plan  
9385 Youbou Road, Youbou, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	S-STP-COM-9	Capital Upgrade/New	Upgrade PLC to CVRD spec in wastewater treatment plant (scheduled).	\$10,000	\$10,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$10,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
	10						
	11						
	12						
Medium Term (5 - 10 Year)	13	1	ALL	Operations	Inspect/assess the wastewater treatment plant, gravity drum filter, UV units, process piping, generator, Orenco treatment cells, and equalization tank.	\$15,000	\$30,000
	14	2 to 4	ALL	Operations	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	\$15,000	
	15						
	16						
	17						
						Total	\$30,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	860 Youbou Sewer System
Civic Address:	9385 Youbou Rd.
Geographic Location:	North of Cowichan Lake
Customers:	Parcels: 78 Users: 43

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$1,578,535
		Value per user	\$36,710

Asset ID	Function Code	Location		DWG Ref	Asset Code			Asset Inventory										Condition Assessment					Recommendations / Action Items		10 Year Capital Plan										
		Address	Location		Major	Minor	Spec	ID	Asset Code	Photo	Description	Make	Model	Material	Quantity	Quantity Unit	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Functional Condition	Demand Condition	Probability of Failure	Severity of Failure	Condition	Description	Type of Work	Replacement Cost	Timing	Comment/Question to be resolved		
1	860	9385 Youbou Rd.	Sewage treatment plant	Site visit / Photos	S	STP	STP	1	S-STP-STP-1	3, 6 to 15, 19	Sewage treatment plant building c/w access road and gate				1	ea	2005		40	27		Refer to Youbou Sewer System Building Condition Assessment.											Refer to Youbou Sewer System Building Condition Assessment.		
1	860	9385 Youbou Rd.	Sewage treatment plant	Site visit / Photos	S	STP	FTR	2	S-STP-FTR-2	6, 7, 10, 11	Gravity drum filter				2	ea	2005		20	7	\$50,000	\$100,000	Good	Meets standard		2	2	4	Inspect/assess the wastewater treatment plant gravity drum filter, UV units, process piping, generator, Orenco treatment cells, and equalization tank.	Operations	\$15,000	5-10 Year			
1	860	9385 Youbou Rd.	Sewage treatment plant	Site visit / Photos	S	STP	UV	4	S-STP-UV-4	6, 8	UV disinfection unit				1	ea	2005		20	7	\$15,000	\$15,000	Good	Meets standard		2	2	4	Inspect/assess the UV unit for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year			
1	860	9385 Youbou Rd.	Sewage treatment plant	Site visit / Photos	S	STP	PP	5	S-STP-PP-5	6, to 8	Process piping c/w valves, pipes, trees				1	LS	2005		40	27	\$60,000	\$60,000	Good	Meets standard		2	2	4	Inspect/assess the process piping for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year			
1	860	9385 Youbou Rd.	Sewage treatment plant	Site visit / Photos	S	STP	GEN	6	S-STP-GEN-6	3, 4	Generator, 60 kW (STP)		Katolight	SP series	1	ea	2005		40	27	\$60,000	\$60,000	Good	Meets standard		2	2	4	Inspect/assess the generator for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year			
1	860	9385 Youbou Rd.	Sewage treatment plant	Site visit / Photos	S	STP	DF	7	S-STP-DF-7	5, 17, 18	Orenco treatment cells				1	LS	2005		20	7	\$150,000	\$150,000				2	2	4	Inspect/assess the Orenco treatment cells for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year			
1	860	9385 Youbou Rd.	Sewage treatment plant	Site visit / Photos	S	STP	ET	8	S-STP-ET-8	3, 16	Equalization tank				1	ea	2005		40	27	\$100,000	\$100,000				2	2	4	Inspect/assess the equalization tank for deterioration to determine replacement timing/phasing	Operations	Included above	5-10 Year			
1	860	9385 Youbou Rd.	Sewage treatment plant	Site visit / Photos	S	STP	COM	9	S-STP-COM-9	12 to 15	Communications (STP)				1	LS	2005		10	0	\$20,000	\$20,000	Fair - dial in, intrusion alarm	Does not meet standard		3	2	3	Upgrade PLC to CVRD spec in wastewater treatment plant (scheduled).	Capital Upgrade/New	\$10,000	2-5 Year			
2	860	9385 Youbou Rd.	Creekside Drive	182-10-00	S	FM	PP	9	S-FM-PP-9		Forcemain, 50mm (1+077 - 1+265, 3+086 - 3+135)				237	m	2005		80	67	\$400	\$94,800				1	3	4	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	Operations	\$15,000	5-10 Year			
2	860	9385 Youbou Rd.	Creekside Drive	182-10-00	S	FM	PP	10	S-FM-PP-10		Forcemain, 75mm (1+265 - 2+111, 2+422 - 3+086)				1310	m	2005		80	67	\$425	\$556,750				1	3	4	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	Operations	Included above	5-10 Year			
2	860	9385 Youbou Rd.	Creekside Drive	182-10-00	S	FM	PP	11	S-FM-PP-11		Forcemain, 100mm (2+111 - 2+622)				511	m	2005		80	67	\$450	\$229,950				1	3	4	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	Operations	Included above	5-10 Year			
3	860	9385 Youbou Rd.	CREEKSIDE DRIVE	GIS	S	FM	PP	12	S-FM-PP-12		Forcemain, 50mm (GIS minus catalogued length from 182-10)				15	m	2005		80	67	\$400	\$5,834				1	3	4	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	Operations	Included above	5-10 Year			
3	860	9385 Youbou Rd.	CREEKSIDE DRIVE	GIS	S	FM	PP	13	S-FM-PP-13		Forcemain, 75mm (GIS minus catalogued length from 182-10)				0	m	2005		80	67	\$425	\$0				1	3	4	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	Operations	Included above	5-10 Year			
3	860	9385 Youbou Rd.	CREEKSIDE DRIVE	GIS	S	FM	PP	14	S-FM-PP-14		Forcemain, 100mm (GIS minus catalogued length from 182-10)				2	m	2005		80	67	\$450	\$775				1	3	4	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	Operations	Included above	5-10 Year			
4	860	9385 Youbou Rd.	YIOUBOU ROAD	GIS	S	FM	PP	15	S-FM-PP-15		Forcemain, 100mm (includes 174m of unknown diameter)				225	m	2005		80	67	\$450	\$101,426				1	3	4	Inspect/assess the condition of the forcemain for deterioration to determine replacement phasing/timing.	Operations	Included above	5-10 Year			
5	860	9385 Youbou Rd.	Entire system	GIS	S	SS	MH	16	S-SS-MH-16		Sewer manholes				1	ea	2005		40	27	\$8,000	\$8,000				1	2	5				10+ Year			
5	860	9385 Youbou Rd.	Entire system	GIS	S	SS	CO	17	S-SS-CO-17		Sewer Cleanouts				12	ea	2005		40	27	\$3,000	\$36,000				1	2	5				10+ Year			
5	860	9385 Youbou Rd.	Entire system	GIS	S	STP	DF	18	S-STP-DF-18		Disposal Field buildings				2	ea	2005		40	27	\$20,000	\$40,000				1	2	5				10+ Year			
5	860	9385 Youbou Rd.	Entire system	GIS	S	LS	BLD	19	S-LS-BLD-19		Pump station buildings (Update GIS information)				0	ea	2005		40	27	\$100,000	\$0				1	2	5				10+ Year			
5	860	9385 Youbou Rd.	Entire system	GIS	S	STP	STP	20	S-STP-STP-20		STP building (Update GIS information)				0	ea	2005		40	27	\$200,000	\$0				1	2	5				10+ Year			

860 Youbou Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

**SEWAGE TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Youbou Sewer DATE: Nov. 21/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 860 PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic) - just services Creekside

2) Site Conditions/Security

860 (1)



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860 Youbou Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



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860 (5)



860 (6)  
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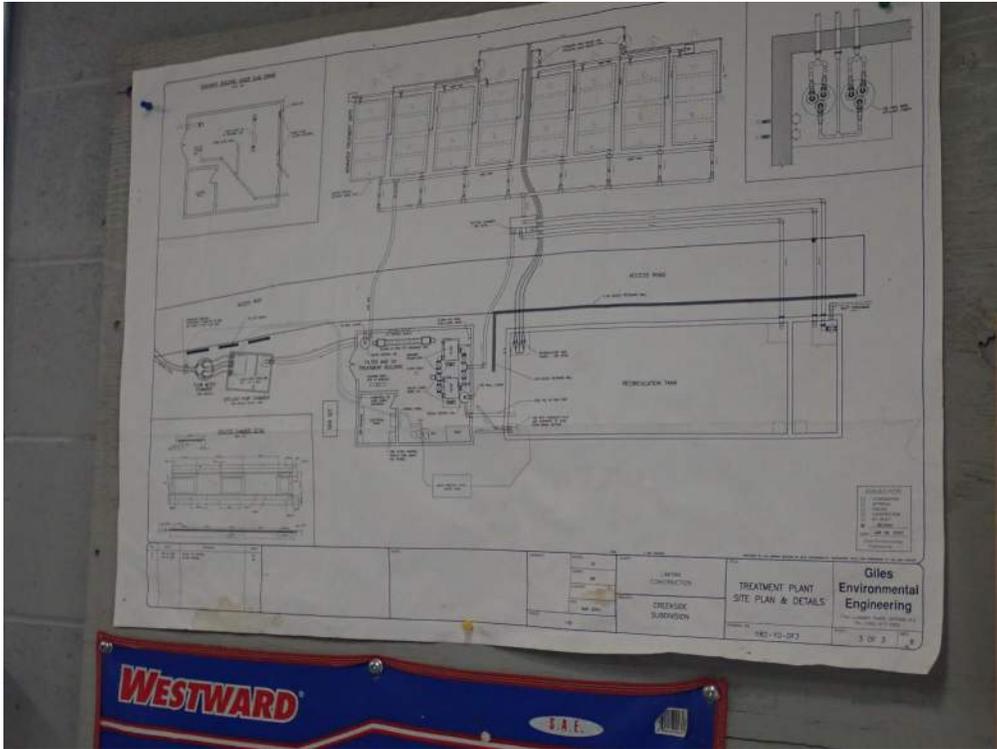


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860 Youbou Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



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860 (11)



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860 Youbou Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's

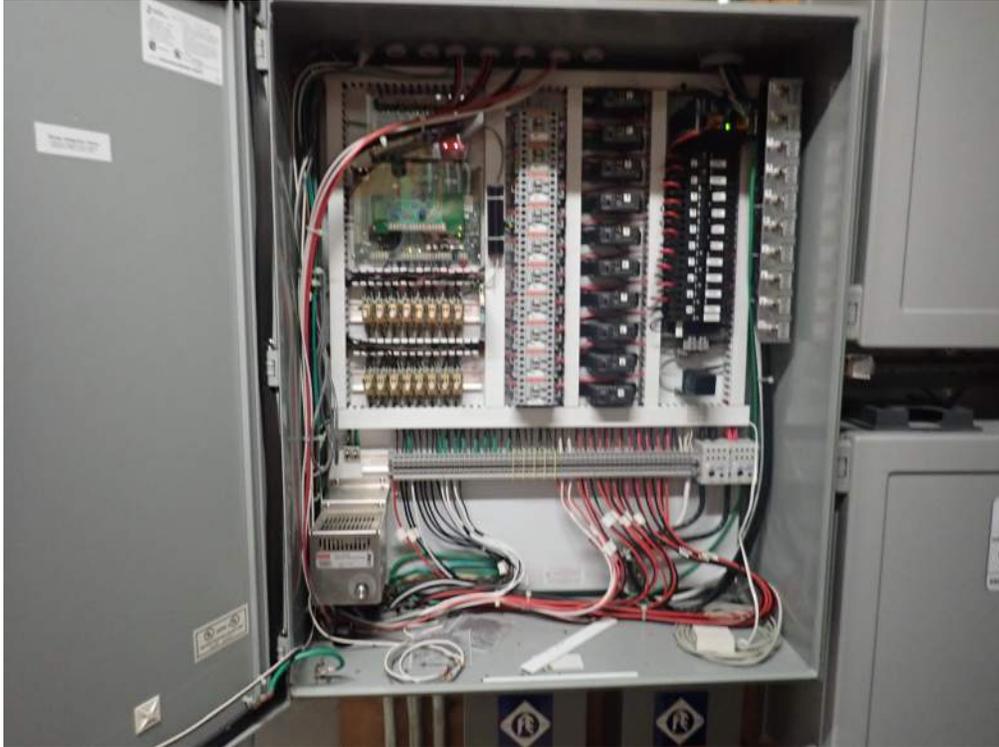


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860 Youbou Sewer-See Infrastructure Condition Assessment table with corresponding photo ID's



860 (21)

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Youbou - Sewer Treatment Plant - Functional Code 860**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST											
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr. Next or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of this building was not known and has been assumed.	5	5	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	650	\$20	SF	\$13,000	0%	5%	5%	\$15,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	650	\$20	SF	\$13,000	0%	5%	5%	\$15,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2010	21-Nov-17	MH	8	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2010	21-Nov-17	MH	8	50	42	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks with a roof framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2010	21-Nov-17	MH	8	50	42	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$20	SF	\$2,000	0%	10%	5%	\$3,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements	1	Wood cladding and wood trim (included roof framing) is present through sections of the building. The wood cladding sections appear to be retrofit areas. Some deterioration was noted in these elements.	4	4	2010	21-Nov-17	MH	8	12	4	Repaint wood cladding, install flashing over exposed wood roof framing.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	10%	5%	\$2,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A metal door (double door) is present on the building.	4	4	2010	21-Nov-17	MH	8	30	22	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1	The roof is sloped assembly which has been waterproofed with a metal roof assembly. MH was not able to access the roof to confirm the roofing assembly.  The roof is drained via gutters to rain water leaders which drain to a below grade system.	4	4	2010	21-Nov-17	MH	8	40	32	Replace metal roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	700	\$20	SF	\$14,000	0%	5%	5%	\$16,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly which has been waterproofed with a metal roof assembly. MH was not able to access the roof to confirm the roofing assembly.  The roof is drained via gutters to rain water leaders which drain to a below grade system.	5	5	2010	21-Nov-17	MH	8	25	17	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000
Youbou - Sewer Treatment Plant	Sewer Treatment Plant	860	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2010	21-Nov-17	MH	8	20	12	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Youbou - Sewer Treatment Plant - Functional Code 860



Photo 1



Photo 2