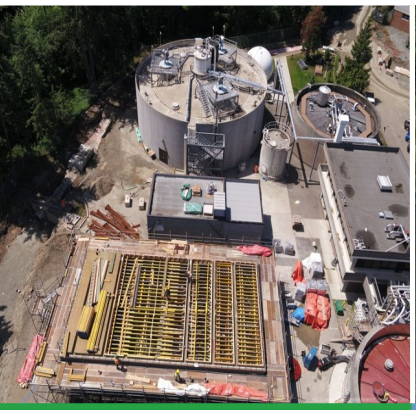
REGIONAL DISTRICT OF NANAIMO




2019 Annual Report

Liquid Waste Management Plan

Submitted to the Ministry of Environment and Climate Change Strategy
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Table of Contents

1) Introduction 1

2) Approval Conditions 1

3) Meetings 2

3.1 LWMP Monitoring Committee 2

3.2 W3C Meetings 2

4) Program Implementation 2

4.1 Highlights 3

4.2 Public Wastewater Systems 6

4.3 Private Onsite Systems 8

4.3.1 Septic Maintenance Rebates 10

4.4 Source Control 11

4.5 Odour Control 14

4.6 Rainwater Management / Drinking Water and Watershed Protection 16

4.7 Volume Reduction 19

4.8 Inflow and Infiltration 22

4.9 Pollution Control Centres 25

4.10 Biosolids 29

4.11 Resource Recovery 32

5) Emerging Issues 33

5.1 Shellfish Harvesting Areas 33

5.2 Contaminants of Emerging Concern 34

5.3 Heritage Resources 34

5.4 Climate Change 34

5.4.1 Sea Level Rise Adaptation 35

5.4.2 Departure Bay Pump Station Vulnerability Assessment 35

5.5 Non-Point Sources of Pollution 35

6) Revisions and Adjustments 36

6.1 Public Wastewater Systems 36

6.2 Private Onsite Systems 36

6.3 Pollution Control Centres 36

7) Audit Summary 37

7.1 Audit Recommendations.....37

8) Outstanding Commitments..... 37

Appendix A – LWMP External Audit 40

Appendix B – W3C Meeting Minutes 41

1) Introduction

Wastewater treatment is necessary to protect our water resources. The Regional District of Nanaimo (RDN) operates four wastewater treatment facilities to serve 125,000 people on sewer:

- Greater Nanaimo Pollution Control Centre (GNPCC)
- French Creek Pollution Control Centre (FCPCC)
- Nanoose Bay Pollution Control Centre (NBPCC)
- Duke Point Pollution Control Centre (DPPCC).

Property owners not connected to sewer, largely those residing in rural areas and island communities, are responsible for their own wastewater treatment and often use privately-owned septic and onsite systems (the region has an estimated 12,000 septic systems). A small number of properties are authorized by Island Health (VIHA) to use pump and haul services and the RDN receives and treats holding tank waste from these properties as well as septage from pumped septic tanks.

The RDN Liquid Waste Management Plan (LWMP) is the region's long-range plan to manage wastewater. It is a commitment to manage wastewater in a manner that aligns with the provincial Municipal Wastewater Regulation and forms our Authorization to Discharge along with Permits and an Operational Certificate.

The RDN's original LWMP was approved in 1999. The current LWMP was approved by the Minister of Environment on October 30, 2014. Annual reporting is a requirement of an approved LWMP and is completed by RDN staff, with the oversight of the LWMP monitoring committee. This report documents implementation in 2019 and also summarizes the progress since 2014.

An independent audit of the LWMP is scheduled for every five years. The first independent audit covered LWMP implementation from the final two months of 2014 to the end of 2019 and is included in Appendix A. A summary of independent audit findings in included in Section 7.

2) Approval Conditions

The current LWMP was approved by the Minister of Environment with two conditions.

Condition #1 states:

> *Within 30 days of receipt of this letter, provide terms of reference, plan and schedule for completion of Stages 1 & 2 of an Environmental Impact Study for each of the GNPCC, NBPCC and French Creek Pollution Control Centre (FCPCC) sewage treatment and disposal facilities.*

Condition #2 states:

> *By January 31, 2015, provide the Environmental Impact Study for the marine portion of the GNPCC outfall replacement project.*

The RDN fulfilled the conditions and responded to the Ministry of Environment (the Ministry) regarding Condition 1 on November 24, 2014, and regarding Condition 2 on January 30, 2015. Copies of letters to the Ministry are included in the 2014 Annual Report.

3) Meetings

3.1 LWMP Monitoring Committee

The Ministry of Environment's Interim Guidelines for Preparing Liquid Waste Management Plans recommend that LWMP monitoring begin shortly after the approved plan implementation begins, once the scope of work for the monitoring committee has been defined and committee members have been established.

The LWMP Monitoring Committee was established in 2015 and meetings were held on:

- June 1 and October 16, 2015
- February 3, March 29, June 21, and October 18, 2016
- March 17, June 12, and November 2, 2017
- May 17 and October 16, 2018
- June 14 and October 24, 2019.

Recent meeting agendas and minutes are available, under Advisory Committees & Commissions, at rdn.bc.ca/agendas-minutes-videos.

3.2 W3C Meetings

RDN staff meet biannually with staff from the City of Nanaimo, District of Lantzville, City of Parksville and Town of Qualicum Beach to advance regional programs and policies related to the LWMP. Meetings are called the Wastewater and Water Collaborative Meeting (W3C).

W3C meetings were held on:

- April 15 and October 16, 2014
- March 12 and September 25, 2015
- March 4 and September 30, 2016
- April 21 and September 22, 2017
- March 2 and September 14, 2018
- March 15 and September 6, 2019.

Minutes from meetings held in 2019 are attached in Appendix B.

4) Program Implementation

The LWMP organizes specific commitments into ten programs. The ten LWMP Programs are:

1. Public Wastewater Systems Program
2. Private Onsite Systems Program
3. Source Control Program

4. Odour Control Program
5. Rainwater Management / Drinking Water & Watershed Protection (DWWP) Program
6. Volume Reduction Program
7. Inflow & Infiltration (I&I) Program
8. Pollution Control Centres Program
9. Resource Recovery Program
10. Biosolids Program

Within each program are objectives, targets and actions. Program objectives are the long-range goals. Targets are ten-year commitments that measure progress towards the objectives. Actions are incremental strategies designed to achieve the target.

4.1 Highlights

Key accomplishments towards LWMP implementation in 2019 include:

- Continued to inform residents of major projects and key initiatives via numerous resource tools such as the RDN website, Get Involved website, social media, newspaper ads, newsletters, letters to residents, education programs, open houses, etc.
- Continued with construction of the GNPCC Secondary Treatment Upgrade through 2019.
- Completed year 3 of the 2017-2019 GNPCC Receiving Environment Monitoring Program.
- Continued with detailed design of the FCPCC Expansion and Odour Control Upgrade.
- Received the "Excellence in Biosolids" award from Northwest Biosolids and beneficially reused 5,660 tonnes of biosolids.
- Finalized detailed design; submitted applications for permits and approvals; and issued a Request for Qualifications for the construction of Collection System, Treatment Plant and Outfall for the Bowser Village Centre Wastewater Project. On March 26, 2019, the RDN Board of Directors decided to discontinue the project due to schedule and cost constraints because the grant was contingent on completing the project by March 31, 2020.
- Delivered four SepticSmart workshops to a total of 156 participants.
- Continued the Septic Maintenance Rebate Program which, has stimulated an investment of over $2 million to maintain septic systems in the region since 2014.
- Contributed $15,000 to the DWWP Action Plan Update.
- Held two LWMP Monitoring Committee meetings.
- Held two W3C meetings to advance LWMP implementation.

Table 1 is adapted from Table 12 of the 2014 LWMP and outlines progress towards key non-capital LWMP deliverables. Table 2 is adapted from Table 13 of the 2014 LWMP and outlines key capital projects. A detailed summary of program implementation is provided in Sections 4.2 through 4.11.

Table 1. Cost Estimates and Timelines for Key Non-capital LWMP Deliverables

Program	Deliverable	Cost Estimate	LWMP Target[1]	Actual
Public Wastewater Systems	Village Centre Review	$10,000	Complete	2013
	Review and update DCC bylaws where necessary	$8,000	2014	2017
Private Onsite Systems	Mandatory Maintenance Feasibility Study	$15,000	Complete	2012
	Revise Pump & Haul Bylaw (No. 975)	$2,000	2014	2017
Source Control	Enhanced Public Education Program	$10,000	2013-2015	Ongoing See Section 4.4
Odour Control	Review the odour management system at GNPCC	$15,000	Complete	2013 and 2015 See Section 4.5
Rainwater Management	Revised Rainwater Management Strategy	$15,000	2014-2016	In progress See Section 4.6
Volume Reduction	Study of overflow potential and elimination strategies	$10,000	2016	2017 See Section 4.7
Inflow and Infiltration	CCTV monitoring of the GNPCC Interceptor	$15,000	Annual	Ongoing
	CCTV monitoring of the FCPCC Interceptor	$23,000	Every 5 years	Ongoing
	Set up an I&I monitoring function for FCPCC and GNPCC	n/a	2014	Ongoing See Section 4.8
	I&I Study	$15,000	2014-2015	2018 See Section 4.8
Biosolids	Biosolids Management Plan	$15,000	Complete	Complete See Section 4.10
Resource Recovery	Resource Recovery Options Study	$25,000	2014-2015	2017 See Section 4.11
Emerging Issues	Climate Change Vulnerability Study	$15,000 ($150,000 grant awarded to the RDN)	2015-2016	2015-2020+ (est) See Section 5.4
LWMP	5-year Audit	$5,000	2019	2020 (for 2014-2019)

1. Some projects were completed by the time the LWMP was submitted for approval in 2014

Table 2. Cost Estimates and Timelines for Major Wastewater Capital Projects

Service Area	Major Capital Projects	Cost Estimate	LWMP Target[1]	Actual
GNPCC	Biofilter media replacement for odour control	$15,000	Complete	2011
	Third digester	$10,000,000	Complete	2013
	Sedimentation tank expansion	$2,700,000	2014	2014
	Outfall Replacement	$18,000,000	2015	2016
	Secondary Treatment[a]	$81,700,000	2018	Est. 2020
	Departure Bay Forcemain Replacement and Expansion	$18,000,000	Monitor	Monitor
	Departure Bay Pump Station Upgrade	$3,052,600	2016-2023	2016-2023
FCPCC	Biofilter media replacement for odour control	$15,000	Complete	2012, 2018
	Reversal of the air flow through the trickling filter	$600,000	Complete	2012
	Seacrest Place forcemain repairs	$660,000	Complete	2012
	Lee Road Pump Station Expansion and Upgrade	$659,000	Complete	2009
	Grit Channel Expansion	$677,000	Complete	2009
	Outfall repairs	$600,000	Complete	2013
	Hall Road Pump station upgrade	$900,000	Complete	2012
	Increasing effluent pumping capacity	$350,000	2018-2025	Est. 2024
	Commission 5th digester cell	$200,000	2018-2025	Est. 2029
	Chemically Enhanced Primary Treatment works	$930,000	2018-2025	Monitor (may not be necessary)
	Interceptor / pump station expansion	$5,000,000	2025	Est. 2023
	Treatment plant capacity expansion, outfall replacement	$32,000,000	2018-2025	Capacity Est. 2023 Outfall Est. 2028

Service Area	Major Capital Projects	Cost Estimate	LWMP Target[1]	Actual
NBPCC	Odour management improvements at outfall manhole	$10,000	Complete	Complete
	Secondary Treatment for 2,000 residents [b,c]	$4,100,000	2023	Est. 2023
DPCCC	No major changes planned	–	–	–

NOTE: 1. Some projects were completed by the time the LWMP was submitted for approval in 2014

a. The 2014 LWMP provided a Class C cost estimate of $67,500,000 and an estimated 2018 completion date

b. Cost estimates provided by AECOM (2012)

c. 2012 dollars

4.2 Public Wastewater Systems

Public wastewater systems, or community sewer systems, are wastewater collection, treatment, and disposal systems owned and operated by the RDN or a municipality. According to the Regional Growth Strategy and Official Community Plans (OCPs), public wastewater systems may be provided a) within a municipality, b) within growth containment areas or c) adjacent to growth containment boundaries where there is a threat of public health or the environment from failing septic systems. Generally speaking, the provision of public wastewater systems is not supported in rural areas.

Objectives of the LWMP Public Wastewater Systems Program are to:

1) address OCP goals of providing wastewater services in growth containment areas, and
2) reduce the threat to human and environmental health from failing onsite systems.

Table 3 summarizes progress towards the LWMP commitments.

Table 3. Public Wastewater Systems Program Commitments

Target: A strategy to achieve wastewater servicing in growth containment areas	
Commitment	**Progress**
i. A study to identify Village Centres with the development potential to warrant an investment in wastewater infrastructure	The Rural Village Centres Study was completed in 2013.

ii. Complete sewer servicing engineering studies for Bowser and Cedar villages	• In 2014, the RDN dedicated $350,000 in Gas Tax Funds to complete sewer servicing studies for Bowser Village and Cedar Village.
	  ○ The *Capacity and Cost Review of the Duke Point Pollution Control Centre* (for Cedar Village Centre sewer servicing) was complete in 2016 and was included in the 2016 Annual Report.
	  ○ In 2017, the RDN completed the Bowser Village Sewer Servicing Study
	• In 2017, the Bowser Village Centre Wastewater Project began as a result of a Clean Water and Wastewater Fund (CWWF) Grant of $7,590,328 to complete design of a disposal option and construct the treatment plant, collection system and outfall for Bowser Village.
	  ○ In 2017, the RDN adopted bylaws establishing the Bowser Village Sanitary Sewer Service and its funding mechanisms
	  ○ In 2018, the RDN updated the collection system and treatment plant design; started submitting the applications for regulatory permits and approvals; continued communicating with First Nations; investigated alternate outfall routes and began detailed design of the marine outfall.
	  ○ In 2019, the RDN finalized detailed design; submitted applications for permits and approvals; and issued a Request for Qualifications for the construction of Collection System, Treatment Plant and Outfall.
	  ○ In 2019, the RDN Board of Directors decided to discontinue the project due to strong public opposition and schedule and cost constraints (the grant was contingent on completing the project by March 31, 2020).

iii. Coordinate with Development Services through the OCP review process to identify property owners in growth containment boundaries who are interested in establishing public wastewater services	Wastewater Services participates in the OPC process as they occur: • Area H OCP review 2015 to 2017 • Area F OCP review began in 2019 • No other OCPs were under review.
Target: A strategy to achieve wastewater servicing for properties with failing private onsite systems	
Commitment	**Progress**
i. Draft a bylaw to allow properties with failing onsite systems to connect to sewer services, where available	Requires an update to several sewage rates and regulations bylaws. This will be addressed in a larger bylaw review project or by assessing properties case by case. RDN will continue to assess properties case by case.

ii. Improve public awareness of areas which may connect to RDN sewer systems for health and environmental reasons (failing onsite system) and create a guide which walks homeowners through the sewer connection application process	A guideline is scheduled for 2022 to 2022.
iii. Work with property owners, as needed, in locations where there are known onsite system failures to establish connections to public wastewater infrastructure	Between 2015 and 2019, RDN responded to 22 service information requests. This resulted in five cases of sewer connection.
iv. Develop a webpage to inform the public of historic sewer servicing studies and of the criteria for the provision of future sewer services	• A website was developed in 2015 for the Bowser Village Sewer Servicing Study. In 2017, the site was upgraded to the RDN Get Involved platform hosted at https://www.getinvolved.rdn.ca/bowser-village-sewer. • A general website for sewer servicing studies is scheduled for 2021 to 2025.

4.3 Private Onsite Systems

Approximately 12,000 homes in the RDN use onsite systems, often called septic systems, to treat wastewater. Septic systems are regulated provincially by the Ministry of Health and Island Health. Property owners are responsible for ensuring their septic system is properly maintained. While the RDN does not have jurisdiction over private onsite systems, the RDN offers a public education program called SepticSmart to empower property owners with care and maintenance tips to maximize the healthy operation of their septic system[1].

The objective of the LWMP Private Onsite Systems Program is to protect the environment and human health from failing private onsite systems.

Table 4 summarises progress towards the LWMP commitments.

Table 4. Private Onsite Systems Program Commitments

Target: Enhance the SepticSmart education program content to encourage regular onsite system maintenance with the intent of prolonging the life of functioning systems and reducing the number of failing systems	
Commitment	**Progress**
i. Annually review the SepticSmart education program; update where necessary	Ongoing. The Septic Maintenance Rebate Program was added in 2014 and is revised annually. See Section 4.3.1 for more information
ii. Enhance the source control component of the SepticSmart program	Ongoing. Updates to the workshop component of SepticSmart were completed in 2013

[1] The RDN also treats septage that is pumped from a septic tank and trucked to one of two RDN septage receiving facilities.

iii. Work with VIHA and Water Services to develop area-specific communications or newsletters for areas at high risk for groundwater contamination	A SepticSmart newsletter was sent to electoral area residents in 2014, 2016, 2017, 2018 and 2019
iv. Host at least four SepticSmart education workshops annually	Since 2008, more than 1,700 people have attended an RDN SepticSmart workshop: • In 2014, 166 people participated in one of four workshops held on October 1, October 7, October 16 and October 21 • In 2015, 48 people participated in one of four workshops held on May 20, May 25, May 28 and June 2 • In 2016, 171 people participated in one of four workshops held on March 2, March 7, September 19 and September 22 • In 2017, 112 people participated in one of four workshops held on April 6, April 10, October 2 and October 5 • In 2018, 121 people participated in one of four workshops held on April 5, April 12, April 26 and May 2 • In 2019, 156 people participated in one of four workshops held on May 1, May 2, May 8, and May 13.
v. Evaluate the potential for a mandatory onsite system maintenance program in the RDN	A Mandatory Maintenance Feasibility study was completed in 2012. A Mandatory Maintenance program was not supported by the RDN Board, which carried a motion instead to continue with an educational role through the existing SepticSmart program
Target: At the request of the owner, allow RDN acquisition of privately owned onsite systems which serve a minimum of 60 parcels	
Commitment	**Progress**
i. Work with Development Services to adopt draft changes to Land Use and Subdivision Bylaw (No. 500) which would enable the RDN to acquire privately-owned onsite systems serving at least 60 parcels, if petitioned	Development Services scheduled a review of Bylaw No. 500 to begin in 2020.
Target: Limit holding tanks in the RDN	
Commitment	**Progress**
i. Review and revise the Pump & Haul Local Service Establishment Bylaw (No. 975) and the Sewage Disposal Regulation Bylaw (No. 1224) so only grandfathered properties and properties with failed onsite systems qualify for the septage receiving rate reduction	A review of the trucked liquid waste and pump & haul bylaws began 2015. Pump and Haul is now regulated under Bylaw No. 1732 which was adopted in January 2017. Repeal of Bylaws No. 975, 988, 1217, and 1224 occurred in 2017. Key points are summarized in Appendix C of the 2016 Annual Report. While Bylaw No. 1732 does not limit pump and haul to grandfathered properties, it clarifies the role of Wastewater Services, which is to set quality standards and establish a rate structure for wastewater treatment. Pump and haul holding

	tanks are permitted by Island Health and the authority to limit pump and haul tanks is with the Province.
ii. Work with VIHA and Building Inspection Services to limit holding tanks on new developments.	See note above. RDN Wastewater Services will work with Island Health in the future if there are efforts led by that agency to limit holding tanks

4.3.1 Septic Maintenance Rebates

In September 2014, the RDN launched the Septic Maintenance Rebate program with the goals of

1. making it easier for residents to manage their septic system maintenance
2. promoting long-term maintenance habits, and
3. maximizing the longevity of existing onsite systems.

In 2019, the RDN provided over $55,000 in Septic Maintenance Rebates to help residents maintain their septic systems. Rebates were offered in the following four categories:

- Category 1: Distribution Box (maximum rebate of $200)
- Category 2: Riser Installation (maximum rebate of $300)
- Category 3: Effluent Filter Installation (maximum rebate of $100)
- Category 4: Replace a Malfunctioning System ($600 flat rate).
- Bonus: increases the maximum rebate amount by up to $100 for applicants who attended a SepticSmart workshop.

From 2014 to 2019, the program stimulated an investment of $2,009,857 to maintain regional septic systems. The breakdown of the investment is as follows:

	Total Septic Maintenance Rebates Allocated	Total Investment (RDN Rebate & Homeowner)
2014[2]	$25,815	$87,220
2015[2]	$24,981	$222,674[3]
2016	$33,043	$239,366
2017	$33,272	$239,315
2018	$49,240	$607,869
2019	$55,294	$613,413
TOTAL	**$221,645**	**$2,009,857**

Rebates have gone to residents in every electoral area plus the City of Nanaimo, City of Parksville and District of Lantzville.

[2] The Western Canadian Onsite Wastewater Management Association of BC (WCOWMA-BC) contributed $8,500 in 2014 and 2015 to boost the SepticSmart incentive program. Since 2016, the rebate was funded entirely from revenue generated from septage receiving fees.

[3] In 2015, full system replacements were eligible for a rebate. This increased the average invoice amount for participating households.

4.4 Source Control

Preventing pollution before it happens is called Source Control. Source control is one of the most effective and economical ways to protect the environment and our natural resources. It also lessens the cost to maintain wastewater infrastructure.

The Source Control Program objective is to reduce contaminants at the source to improve the quality of influent, effluent and biosolids. Progress towards the LWMP commitments is summarized in Table 5.

Table 5. Source Control Program Commitments

Target: Enhance regional source control through a single unified bylaw similar to the Sewer Use Regulatory Bylaw (No. 1225) or through consistent municipal bylaws	
Commitment	**Progress**
i. Work with the municipalities to develop similar source control bylaws or adopt a single bylaw	The W3C Source Control working group formed in 2015, in part to advance regional source control. Regional Sewage Source Control Bylaw No. 1730, 2015 and Bylaw Enforcement Ticket Regulation Amendment Bylaw No. 1418.04, 2015 were adopted on November 24, 2015 and replace Bylaw No. 1225, and include updated and improved contaminant restrictions, user fees for waste discharge permits. Advice regarding the use or reference of Bylaw 1730 by each of the RDN's member municipalities was provided to municipal wastewater staff in 2016.
ii. Amend the Trucked Liquid Waste Disposal Bylaw (No. 988) to allow marinas to apply for reduced holding tank waste disposal rates if they provide free pump-out services to discourage marine dumping	Trucked Liquid Waste Bylaw No. 1732 was adopted in January 2017 and allows a reduced rate of $0.01/gallon for holding tank waste from marine sewage reception facilities, with approved application. Bylaw No. 1732 repealed and replaced Bylaw No. 988.
iii. Work with municipalities, marinas, and/or harbour authorities to accept wastewater from marine vessels as opportunities arise	• Bylaw No. 1732 makes marine sewage reception facilities eligible for Holding Tank Registration ($0.01/gallon) if they only accept sanitary sewage from marine vessels and do not charge for the disposal. • The RDN accepts wastewater from BC Ferries' ships docking at the Departure Bay, Gabriola Island and Duke Point terminals. • In 2016 the RDN began accepting wastewater from Seaspan vessels.
Target: Enhance the education and outreach strategy, as required	
Commitment	**Progress**
i. Collaborate with other RDN departments to promote pollution prevention strategies	• In 2013, the RDN (led by Wastewater Services) launched a unified outreach website called "RDN Get Involved" with a goal of promoting RDN outreach strategies including pollution prevention. In 2017, the RDN Get Involved program was replaced with a new public engagement platform at www.getinvolved.rdn.ca. • Collaborated with Water Services on Water Day events in

		Nanaimo on March 20, 2016 and in Qualicum Beach on April 3, 2016
ii.	Liaise with other local governments to share source control strategies	• Source control information is shared at the W3C meetings (listed in Section 3.2) • In 2017, hosted a booth at City of Nanaimo Public Works Day • In 2017 the RDN partnered with Metro Vancouver to share the "Don't Flush Wipes" campaign • In 2018 and 2019, Wastewater Services participated in the new BCWWA Source Control Community of Practice meetings.
iii.	Promote source control through the SepticSmart program	Source control is part of the SepticSmart program.
iv.	Encourage green boating practices	Georgia Strait Alliance's Guide to Green Boating is promoted on the RDN's Pollution Prevention page.
v.	Target the outreach program on RDN residents, medical clinics, the hospital, and businesses to address pharmaceuticals, personal care products, organics, fat, oil, grease, and I&I	• The RDN teams with the BC Pharmacy Association to encourage residents to take part in the BC Medications Return program, which allows for the return of medication to participating pharmacies. On May 17, 2016, the RDN and the BC Pharmacy Association issued a joint media release on the topic of safe disposal of unused medications. • In 2017, Wastewater Services created Best Practices handouts for Household Kitchen Waste and Household Cleaners • In 2018 Wastewater Services invested over $5,000 to update public education material to align with the RDN 2018 Graphic Standard • In 2019, "No Drainers" poster was produced for elementary school audience.

vi.	Partner with RDN community members with an interest in promoting source control (e.g. non-governmental organizations; local stewardship groups)	Progress is ongoing, see www.teamwatersmart.ca.
		• 2014 and 2015 – RDN partnered with WCOWMA-BC to provide rebates for septic system maintenance
		• In 2014 to 2019 – RDN Team WaterSmart partners with community groups to host workshops and events related to water conservation and protection.
		  ○ 2014 – RDN partnered with community members to host a free Rain Garden Workshop and two streamside stewardship workshops (Departure Creek and Nile Creek) in a series of 10 workshops related to water conservation and protection
		  ○ 2015 – RDN partnered with community members to host one streamside stewardship workshop (Grandon Creek) and two rainwater harvesting workshops, in a series of 10 workshops related to water conservation and protection
		  ○ 2016 – Co-hosted Water Day events held March 20, 2016 in Nanaimo and April 3, 2016 in Qualicum Beach

	○ 2017 – Co-hosted Water Day events held March 12, 2017 in Parksville and April 23, 2017 in Nanaimo. ○ 2018 – March 10 to April 21, 2018, RDN Team WaterSmart hosted events and activities for "Water to Earth month" ○ 2019 – March 22 to April 22, 2019, RDN Team WaterSmart hosted events and activities for "Water to Earth month" • 2014 to 2019 – Team WaterSmart performed 128 residential irrigation check-ups to help residents reduce outdoor water use • 2014 to 2019 – Community stewardship groups participated in the RDN's Community Watershed Monitoring Network surface water quality monitoring program (see Action 2 ii in Section 4.6) • 2019 – Partnered with Walley Creek Streamkeepers and the Ministry of Forests, Lands, Natural Resource Operations and Rural Development to allow stream flow monitoring and set up a hydrometric monitoring station on RDN GNPCC property
vii. Consider publishing regular articles (e.g. newspaper or Regional Perspectives) promoting source control	• In 2018, the RDN began publishing monthly advertisements in the local newspapers. The ads periodically include information on rebates, SepticSmart workshops, water conservation, and open house opportunities. • In 2019, social media presence increased to promote source control and other LWMP programs.
viii. Update the RDN website information on source control	ONGOING – Website information is updated periodically. • In 2019, the "Pollution Prevention" webpage page was replaced with the "Flush It Right – What Goes Where" webpage at www.rdn.bc.ca/flush-it-right. • The Solid Waste What Goes Where App was updated in 2019 to include "Do not flush down the toilet" and "Do not put down the drain" to certain items.
Target: Monitor wastewater influent	
Commitment	**Progress**
i. Monitor influent and biosolids quality and review discharge permits to assess potential contaminant sources	• Influent is monitored according to the permit and operational certificates for each facility • Biosolids quality is monitored and reviewed regularly according to the Organic Matter Recycling Regulation • RDN-issued discharge permits account for an insignificant percentage of the overall flows in all areas except Duke Point
ii. Work with RDN Bylaw Services to provide enforcement as needed.	As needed. No incidents required bylaw enforcement in 2019.

4.5 Odour Control

Odours refer to nuisance odours emitted by wastewater treatment facilities and associated interceptors, pump stations, outfalls, and other RDN wastewater collection and treatment infrastructure. Odour is managed at all wastewater facilities.

The Odour Control Program objective is to reduce nuisance odours from RDN wastewater infrastructure, including the wastewater treatment plants and associated facilities. Progress towards the LWMP commitments is summarized in Table 6.

Table 6. Odour Control Program Commitments

Target: Maintain and upgrade equipment so <10 nuisance odour complaints are made per facility per year	
Commitment	**Progress**
i. Continue using current odour control measures; consider new control technologies as required	• Ongoing • Improved odour control system incorporated into the GNPCC Secondary Treatment Upgrade (see vi and viii below) • The French Creek Pollution Control Centre Expansion will incorporate extensive odour control upgrades • Odour potential was considered in the 2019 Draft Nanoose Pollution Control Centre Secondary Treatment Process Selection and Concept Design. All options considered scored a 4 for odour potential where 1 represents a high risk of odour and 5 represents very little to no odour potential.
ii. Address odour at Bay Ave Pump Station	• Ion generator was installed in 2011. • No odour complaints for Bay Ave Pump Station between 2014 and 2019. • The Bay Avenue Pump Station Upgrade Project will further address potential odours. The RDN awarded the contract for detailed design in 2019.
iii. Replace biofilter media at GNPCC and FCPCC	Completed 2011 at GNPCC. Replacement scheduled in 2020 as part of the Secondary Treatment Upgrade. Completed 2012 and 2018 at FCPCC.
iv. Reverse the air flow through the trickling filter at FCPCC	Completed 2012
v. Install ion generators at Hall Road and Chase River Pump Stations	Completed 2011 & 2012
vi. Review the odour management system at GNPCC to identify potential improvements	• In 2013, completed the Greater Nanaimo Pollution Control Centre Odour Study • In 2015, completed the GNPCC Secondary Treatment Project Odour Assessment Modeling – Technical Memorandum No. 7

vii. Complete improvements to the NBPCC outfall manhole odour management system	Completed 2013

viii. Incorporate odour controls into the design phase of future capital works projects including upgrade of GNPCC, NBPCC and expansion of FCPCC	• GNPCC Secondary Treatment Upgrade:
	  ○ In 2015, Preliminary Design Report included an odour strategy
	  ○ In 2017, the 100% Design Report included an odour strategy.
	  ○ Odour control upgrades were complete in 2019. All higher strength process foul air sources were directed to a centralized biofilter consisting of two new synthetic media biofilters. Lower strength foul air sources were directed to decentralized activated carbon scrubbers. The upgrades should significantly reduce odours outside the property boundaries.
	• FCPCC Expansion:
	  ○ In 2018, Preliminary Design included an odour strategy.
	  ○ 2018-2019: Detailed design will include a significant odour control upgrade.
	  ○ 2019-2020: The RDN is partnering with Vancouver Island University who will use sophisticated equipment to fingerprint FCPCC's current odour emissions and recommend odour control strategies.
	• NBPCC Secondary Treatment Upgrade:
	  ○ Process selection and conceptual design began in 2019

ix. Seek resident input before upgrading or expanding facilities	• The RDN completed extensive public consultation during the LWMP amendment process and continues to seek input through open houses, public meetings and through the LWMP Monitoring Committee. • The RDN offered open houses specific to the GNPCC upgrade before the construction tender was awarded in early 2017 for the Secondary Treatment Upgrade Project. Open houses were held on February 10 and 11, 2015, July 8, 2015 and June 11, 2016. • The RDN offered an open house at FCPCC on May 9, 2015, April 30, 2016, and June 2, 2018.
Target: Investigate, document, and respond to odour complaints within 24 hours	
Commitment	**Progress**
i. Investigate, document, and respond to odour complaints within 24 hours	Ongoing. In 2019, there were 41 foul odour reports for FCPCC, 6 for GNPCC, 10 for NBPCC, and no reports for DPPCC. The annual report for each facility provides more detail.

4.6 Rainwater Management / Drinking Water and Watershed Protection

Rainwater management, often referred to in the past as stormwater management, refers to the management of precipitation and associated strategies to protect the health of watersheds and maintain a pre-development water balance. The RDN utilizes a wide range of management tools for rainwater, through strategic planning, the Regional Growth Strategy, Official Community Plans, the Drinking Water & Watershed Protection (DWWP) Program, infrastructure engineering standards and the LWMP.

The DWWP program, offered through the RDN Water Services department, serves as the platform for implementing the rainwater management commitments under the LWMP. The DWWP program focuses on learning more about our water resources to better manage and protect them, ultimately with an integrated watershed management approach. Effective partnerships with community members, government agencies, academia, and business are key to the success of the initiatives under this program.

The Rainwater Management / Drinking Water & Watershed Protection Program objectives are:

1) use rain as a resource
2) promote the maintenance of hydrologic function, and
3) protect the quality of water.

Progress towards the LWMP commitments is summarized in Table 7.

Table 7. Rainwater Management / Drinking Water & Watershed Protection Program Commitments

Target: Develop a regional strategy on rainwater management in coordination with member municipalities	
Commitment	**Progress**
i. Collaborate with Development Services, Water Services, Energy & Sustainability Services, and member municipalities to create a Rainwater Management Plan	• In 2010, the study Overcoming Barriers to Green Buildings in the RDN was completed. • In 2012, the RDN published the Rainwater Harvesting Guidebook. It is available digitally for residents to access on our website, and hardcopies are distributed upon request and at Team WaterSmart events across the region. • In 2014, the RDN reviewed the current land use bylaws and regulations to identify potential barriers to green building features, including rainwater harvesting, and to propose regulatory changes. Green building bylaw amendments (Bylaws No. 500.396 and No. 1285.22) received first and second reading in October 2014 and were adopted in February 2015. • In 2016, the RDN Board submitted a resolution to AVICC urging the Province to develop rainwater-specific standards for sourcing, treatment, and infrastructure to further enable the implementation and approval of rainwater sources for potable water. This resolution was enabled at the AVICC Conference in April 2016, and subsequently at the Union of BC Municipalities (UBCM) Conference in
ii. Liaise with other local governments to share rainwater management strategies	
iii. When developing the plan, consider subdivision development standards (i.e. low impact development principles, green infrastructure policies, erosion and control standards, onsite rainwater management, watercourse protection, and wetland protection) and non-point source control (i.e. runoff pollution)	
iv. Support Building Code changes that remove barriers to rainwater	

harvesting	September 2016.
v. Subject to Board approval of the Rainwater Management Plan, Wastewater Services and Water Services will coordinate the plan, administer the budget, and oversee collaboration with other departments and jurisdictions	• In 2018, several RDN Directors met with the Minister of Health, Adrian Dix at the Union of British Columbia Municipalities (UBCM) Convention to discuss the challenges of securing water in the Regional District and Gulf Islands and to request the Province develop guidance and standards to permit the use of rainwater as a potable water source for small water systems.
vi. Establish watershed performance targets and standards to mitigate the impacts of land development	• The RDN Co-hosted the Nanaimo Water Stewardship Symposium 2018 and the Parksville Water Stewardship Symposium 2019that each had a focus on green infrastructure, natural assets and watercourse protection. • In 2018, the City of Nanaimo completed the Municipal Natural Asset Initiative; a benchmark study across Canada that calculated the value of Buttertubs Marsh as a natural stormwater asset. • In 2019, the DWWP Action Plan Update was underway. Wastewater Services contributed $15,000 to the update. The 2019 Draft DWWP Action Plan includes an action item to "Develop a regional strategy on rainwater management in coordination with member municipalities". Information on the update is available at www.getinvolved.rdn.ca/dwwp-action-plan-update-2019.
Target: Implement rainwater management initiatives as detailed in DWWP Action Plan	
Commitment	**Progress**
i. Develop a regional Water Budget to increase our understanding of ground and surface water resources	• Phase 1 of the Water Budget was completed in 2013. • Phase 2 in 2017 added additional groundwater and surface water monitoring sites in priority target areas including Cedar-Yellowpoint, Nanoose and French Creek. • Phase 3 began in 2019 and is ongoing. See rdnwaterbudget.ca

ii. Monitor water quality in selected streams to study the impact of land use on watershed health (e.g. Community Watershed Monitoring)	• In 2018, the RDN DWWP program hired consultants to analyze and report on surface water quality data trends observed over the past 7 years of the Community Watershed Monitoring Network (CWMN) in a comprehensive review that included streamflow, climate and land use. See "Surface Water Quality Trend Analysis CWMN 2011-2017" • The CWMN completed its ninth year in 2019, continuing to collect surface water quality data – turbidity, dissolved oxygen, temperature, conductivity – from over 60 established monitoring locations and implementing recommendations from the 2018 Trend Analysis, including additional lab analysis and refining processes for data management. • Two sampling sites were added to the CWMN specifically to monitor wastewater infrastructure where it intersects or neighbours streams (lower Chase River and Holden Creek).
iii. Monitor the impacts of climate change on hydrology in the RDN to identify flood risks	• Ongoing. In 2014, the RDN completed a regional hydrometric and climate monitoring review and identified priority areas and partners interested in expanding data network. • In 2015 a snow pillow / weather station at Mt. Arrowsmith was installed in collaboration with several partners. • A hydrometric monitoring station on Haslam Creek was installed in 2016 and on Nanoose Creek in 2017, and on French Creek in 2018 to address those priority data gaps. • A climate station was installed in the Upper Nanoose Creek watershed in 2018, through partnership with Island Timberlands. • A geodatabase has been put together to house all the climate/hydrometric stations for ease of access to information for long term planning or to monitor flood risk / intense rain events.
iv. Continue to implement the seven programs detailed in the DWWP Action Plan including integrated watershed management planning	• In 2018, the DWWP Action Plan implementation from the first 10 years was reviewed by third-party analysts and a report on progress was presented to the Board. See "DWWP Action Plan – 10 Year Implementation Review" • In 2019, the DWWP Action Plan update took place, incorporating the findings from the 10-year review and from engagement sessions with key stakeholders and the public. This includes overlapping commitments in RDN LWMP for rainwater management.

v. Implement the Water Conservation Plan	• 2013 Water Conservation Plan • Graphical billing was piloted in 2014 and 2015. • The Watershed Friendly Yard campaign started in 2014 and continued in 2015 and 2016, using attractive yard signs and a draw for a rain barrel to encourage and highlight water efficient landscape practices in the community. • A WaterSmart Garden Rebate program for efficient irrigation and soil improvements was piloted in all RDN Water Service Areas in 2016 and ran region-wide in 2017 and 2018. It is now called the Irrigation Upgrade and Soil Improvement Rebate and it was continued successfully in 2019. • In 2018, the RDN Water Systems' progress against the targets laid out in the 2013 Water Conservation Plan was reviewed – found that RDN Water Systems are on track to meet targets across all service areas (observed 31% decrease in water use per connection since 2004). See Water Conservation Evaluation – RDN Water Service Areas 2018 • In 2019, the RDN issued a Request for Proposals to update the Water Conservation Plan and recommend new targets. This work is ongoing into early 2020.
vi. Refine the Water Budget Study to assist in land use and development decisions	• A refined Water Budget for Nanoose was developed in 2019 and is planned for French Creek in 2020/21
vii. Continue to provide water education, incentive programs and watershed monitoring partnerships	ONGOING: Team WaterSmart provides these programs and partnerships through: • Team WaterSmart educational workshops • Team WaterSmart community booths • School presentations and field trips • Rainwater harvesting incentive program • Rural Water Quality Protection incentive program (for well water testing, wellhead construction upgrades, well closure) • Irrigation and Soil Rebate Program offers incentives for homeowners to upgrade to efficient irrigation hardware / controls and to augment their soil/mulch

4.7 Volume Reduction

The Volume Reduction Program promotes potable water conservation, results in less water entering public wastewater systems, lowers the cost to treat wastewater, and reduces the potential for overflows.

The Volume Reduction Program objective is to reduce wastewater production by promoting water conservation measures. Progress towards the LWMP commitments is summarized in Table 8.

Table 8. Volume Reduction Program Commitments

Target: Promote a reduction in per capita water consumption	
Commitment	**Progress**
i. Promote water conservation incentives like low-flow toilet rebates	The RDN offered a low-flow toilet rebate from 2009 to 2013. This program is now complete. Over 1,500 toilets were replaced under this program, for a total of over 50 million litres of water saved each year, from here forward. Other RDN rebates are advertised at www.rdnrebates.ca.
ii. Work with provincial regulators to provide public with information around opportunities for greywater reuse, as supported by the BC Building code and provincial regulations	The BC Ministry of Health published the Manual of Composting Toilet and Greywater Practice in 2016.
iii. Educate the public through free workshops and online information	Ongoing. • Website: The Team WaterSmart (teamwatersmart.ca) website provide water conservation tips and lists free workshops. It also includes an interactive map showing the watering restrictions in effect in each water service area, municipality and improvement district within the region. The GetInvolved page at www.getinvolved.rdn.ca/team-watersmart/ also provides many water conservation tips and brochures. • Free Irrigation Checkups: Since 2010, Team WaterSmart staff performed residential irrigation check-ups. The program has effectively caught leaks, lowered excessive watering times & advised on water-saving techniques. 65% of participants reduce their summer water use after taking part in the program. From 2014-2019, Team WaterSmart performed 128 residential irrigation check-ups to help residents reduce outdoor water use. • Workshops: Team WaterSmart hosts public education and free workshops each year. In 2019, RDN Team WaterSmart hosted events and activities for "Water to Earth month". This included workshops on topics related to water conservation and watershed protection, field trips and steam walks. Community partners co-hosted many of the events alongside RDN Team WaterSmart.

iv. Hold semi-annual meetings with the City of Nanaimo, District of Lantzville, City of Parksville, and Town of Qualicum Beach to develop a regional volume reduction strategy	• The W3C meetings, listed in Section 3.2, are semi-annual meetings with the municipalities and volume reduction is a topic covered. • In 2016, the RDN worked with municipal water providers to harmonize the outdoor watering restrictions framework for the region. Now, watering restriction stages are defined consistently across the region. The RDN convenes regular calls with major water purveyors in the region to discuss watering restrictions and water conservation communications once per month between May – September. One central website, managed by the RDN, illustrates what watering restrictions are in effect within the region www.rdn.bc.ca/watering-restriction-map
v. Continue to develop and implement water conservation measures through the DWWP service, with a target of reducing per capita water consumption by 25% between 2009 and 2030	In 2018, the RDN Water Systems' progress against the targets laid out in the 2013 Water Conservation Plan was reviewed and found that RDN Water Systems are on track to meet targets across all service areas • observed 31% decrease in water use per connection since 2004 • observed that maximum month water production stayed well below the reference threshold of 2004 production levels, between 2011- 2017 See Water Conservation Evaluation – RDN Water Service Areas 2018.
Target: Reduce water consumption in RDN buildings and wastewater treatment operations	
Commitment	**Progress**
i. Install low-flow or dual flush toilets and other water-saving devices in RDN buildings	• Ongoing with new construction according to the Corporate Climate Change Plan • 2015 – Low flush toilets were installed at the FCPCC decontamination building • 2019 – Low flush toilets and showerheads were installed at GNPCC
ii. Consider water efficient technology when designing infrastructure upgrades and expansion	• Water consumption at FCPCC decreased by 63% between 2010 and 2019 due to water saving technology (i.e. new technology to pressurize the seals on pumps using air pressure and water as opposed to constant water flow)
iii. Promote the use of reclaimed water when practicable	• FCPCC uses treated effluent during operation as process and wash water in place of potable water. • The GNPCC Secondary Treatment design uses treated effluent in process water in place of potable water

Target: Eliminate sanitary sewer overflows	
Commitment	**Progress**

iv. Identify potential sources of sanitary sewer overflows and develop a strategy to eliminate	• In 2017 the Nanaimo Interceptor Hydraulic Modeling Study was completed. The steady state simulation did not predict any overflows within the study area (the interceptor south of the Departure Bay Pump Station and DBPS capacity).
	• Two overflow events occurred in association with wet weather events from 2014 to 2019:
	  ○ January 2018, at Brechin boat ramp and Maffeo Sutton Siphon
	  ○ January 2019, at Chase River Pump Station.
	• In response to the two overflows,
	  ○ the hydraulic modeling study is being revised to determine capacity and projected flows at the siphon and options to address the capacity deficit at the Millstone River will be developed.
	  ○ We are developing a strategy to increase capacity at the DBPS (implemented 2020 to 2025).
	  ○ The Chase River Forcemain was replaced and upsized (2019-2020).

4.8 Inflow and Infiltration

Inflow refers to rainwater or snowmelt that enters the sanitary sewer system from a direct stormwater connection (e.g. roof leaders, basement sump pumps, or foundation drains). Homes built before the 1970s can be major sources of inflow since building permits at the time allowed property drainage to connect to the sewer system.

Infiltration refers to groundwater (marine or freshwater) that enters the sewer system. Infiltration can occur via pipeline cracks, leaky joints or deteriorated manholes. I&I is a term to collectively describe inflow and infiltration.

I&I are regulated under the Municipal Wastewater Regulation and are measured in reference to the average dry weather flow (ADWF), the daily municipal flow to a wastewater facility after an extended period of dry weather such that I&I is minimized to the greatest extent practicable.

Inflow & Infiltration Program objectives are:

1) to reduce inflow and infiltration entering the wastewater collection and treatment system and
2) to meet Municipal Wastewater Regulation standards for I&I.

Progress towards the LWMP commitments is summarized in Table 9.

Table 9. Inflow & Infiltration Program Commitments

Target: Monitor I&I entering RDN infrastructure	
Commitment	**Progress**

i. Set up an I&I monitoring function for GNPCC and FCPCC in FlowWorks (flow monitoring system)	• FlowWorks data reviewed semi-annually to determine the relationship between rain events and higher wastewater flowrates
	• FlowWorks data were used in modelling studies to understand the influence of I&I:
	  ○ GNPCC: 2017 Nanaimo Interceptor Hydraulic Modeling Study.
	  ○ FCPCC: 2016 French Creek Trunk Sewer System Hydraulic Modelling & Upgrade Strategy.

ii. Evaluate flow data to understand system reaction to rainfall and high flow events	Catchments with high flows (from data above) are further investigated as needed by staff of member municipalities and strategies to reduce I&I are developed in consultation with municipalities
iii. Use CCTV to inspect GNPCC and FCPCC interceptors on a 5-year cycle	GNPCC and FCPCC have ongoing CCTV programs which inspect accessible sections of the gravity interceptor. (Forcemain sections are not part of the CCTV program and poor access limits CCTV of some sections.) • FCPCC sections done in 2018/2019: Qualicum Beach Manhole 30 to 40, 24 to 30, Parksville 29 to 36. 2019 QB 30 to 35, and 10 to 23. • GNPCC sections in 2019: 1. North Slope Trunk (manholes #40 to #44), 2. North Slope Trunk (manholes #45 to #51), 3. Nanaimo Interceptor (manholes #1 to #13), 4. Nanaimo Interceptor (manholes #14 to #26)
iv. Maintain and install flow meters and rainfall gauges as needed	• Environment Canada and member municipalities operate rain gauges • Installed influent flow meter at FCPCC in 2015. • In 2016, new wireless modems installed on all flow meters. Level sensors in flow meters are tested monthly for accuracy. • The Ocean Place Flow meter was repaired in 2017 and replaced in 2018. • Wiring was repaired on the Lantzville flow meter in 2018. • In January 2018, the laser flow meter at GNPCC was replaced by a Parshall Flume to improve the accuracy of flow measurement. • Replaced the influent meter at FCPCC with one that is intrinsically safe in 2018.

Target: Reduce I&I directly entering RDN owned infrastructure	
Commitment	**Progress**
i. Repair manholes as needed; perform regular maintenance of interceptors	FCPCC: • Performed routine inspections of manholes and interceptors annually • Performed manhole repairs in 2014, 2015, 2017 (see annual reports for details) • In 2015, the RDN completed the Qualicum Beach Interceptor Pipeline Protection study. • In 2016, an erosion protection project was completed on the Qualicum Interceptor between manholes 16 and 17. A second erosion protection project was completed in 2019. GNPCC: • Performed routine inspections of manholes and interceptors annually • In 2019, three GNPCC Northslope manholes were repaired
ii. Investigate grant funding opportunities (e.g. Gas Tax Fund) for infrastructure rehabilitation	• In 2015, applied to the New Building Canada fund for FCPCC Interceptor and Pumpstation Ugrades – application not successful • In 2016, applied to the Clean Water and Wastewater Fund (CWWF) to (a) replace sections of the Nanoose Bay sewer forcemain and (b) to replace sections of the Chase River Forcemain and upgrade the Pump Station – applications not successful • In 2018, applied to the Investing in Canada Infrastructure Program to replace sections of the Chase River Forcemain and upgrade the Pump Station – application not successful • Grant funding applications for secondary treatment and plant upgrades is listed in the Pollution Control Centres Program (Section 4.9).
Target: Provide secondary treatment for flows up to 2 times ADWF and at least primary treatment for flows beyond 2 times ADWF during storm or snowmelt events with less than a 5-year return period	
Commitment	**Progress**
i. Design upgrades to RDN infrastructure so flows up to 2 times ADWF will receive secondary treatment and all flows in excess of this amount will receive primary treatment	• 100% Design for GNPCC Secondary Treatment Upgrade Project, completed in 2017, provides secondary treatment for 2xADWF and primary treatment for all flows beyond 2xADWF. GNPCC upgrades under construction in 2019 • 60% Design for FCPCC Expansion and Odour Control Upgrade Project, completed in 2019, provides secondary treatment for 2xADWF and primary treatment for all flows beyond 2xADWF.

Target: Develop a regional strategy on I&I management	
Commitment	**Progress**
i. Hold semi-annual meetings with the municipalities to develop regional monitoring and reduction targets for inflow and infiltration	The W3C meetings, listed in Section 3.2, are semi-annual meetings with the municipalities and inflow and infiltration is a topic covered.
ii. Share flow and rainfall data with municipalities	Flow monitoring data is shared at the W3C meetings
iii. Consider requiring replacement or disconnection of private laterals when granting demolition permits	Considered at W3C in 2014 and 2015. Decided to focus on RDN-owned infrastructure instead of private property.
iv. Consider providing municipal or regional staff to witness or perform service connections	Considered and it was determined that witnessing or performing services connections is the responsibility of the municipality and not regional staff.
v. Work with the member municipalities to continue to reduce flows due to I&I and to eliminate sewer overflows	• I&I was discussed at the biannual W3C meetings. • City of Nanaimo continues to grout manholes to reduce I&I. • City of Nanaimo completed an Inflow and Infiltration Reduction Strategy in 2018. • City of Nanaimo Public Works crews continued to remove the Harewood wyes, a significant source of I&I, in 2018.
Target: Encourage I&I reduction on private land through public education	
Commitment	**Progress**
i. Enhance the source control program to encourage landowners to check gutters and outside drains for connection to the sewer system, avoid planting trees and shrubs over sewer laterals, ensure basement drains and sump pumps are not connected to the sanitary sewer, and replace broken or leaky pipes located on private property	Still to come
ii. Consider providing incentives to enable residents to reduce private property I&I	Strategies to reduce private property I&I have been discussed at W3C meetings. To date, the priority has been on addressing I&I on owned infrastructure.

4.9 Pollution Control Centres

The Pollution Control Centres Program objective is to meet Municipal Wastewater Regulation standards and sustainably manage wastewater treatment at GNPCC, FCPCC, NBPCC, DPPCC, and associated facilities. Progress towards the LWMP commitments is summarized in Table 10.

Table 10. Pollution Control Centres Program Commitments

Target: Comply with permit or operational certificate	
Commitment	**Progress**
i. Manage wastewater collection and treatment using the RDN's Environmental Management System (EMS) to meet permit requirements	RDN Wastewater Services has been ISO 14001 Certified since 2005 and has been part of the National Water and Wastewater Benchmarking Initiative since 2001 with the goal of continually improving service and environmental performance
ii. Work with MOE staff to establish reasonable timelines and scope of any required receiving environment monitoring programs	A Receiving Environment Program was developed in December 2016. 2017-2019 monitoring program results are summarized in separate documents.
Target: Manage assets to maintain the quality and integrity of existing infrastructure	
Commitment	**Progress**
i. Update and evaluate asset management and preventative maintenance plans	• An integrated Asset Management strategy was prepared in 2014 to guide Asset Management development with a consistent organization-wide approach. • The Board approved an Asset Management Policy in 2016 (provided in 2016 annual report) and created a new department responsible for organization-wide asset management activities. • The Asset Management Review and Implementation Report was completed in 2019. • Preventative maintenance plans are ongoing through Web Work, our computer maintenance management system, in which we create work orders for preventive, corrective, urgent and emergency work on equipment.
ii. Systematically inspect, detect, and correct incipient failures	Wastewater Services has a Computer Maintenance Management System used for preventative, corrective, urgent, and emergency maintenance
iii. Replace the GNPCC effluent outfall line	Replacement of the outfall began in 2014 and was complete in 2016
iv. Prepare an Environmental Impact Study for the GNPCC outfall	The EIS for the land portion of the outfall was complete in May 2014. The EIS for the marine portion of the outfall was completed in October 2015
v. Monitor the condition of the Departure Bay forcemain	• 2016 – Performed monthly visual inspections and routine annual air/vacuum relief valve inspections. • 2017 – Completed a condition assessment using "Pipe Diver" and "Smart Ball" electromagnetic sensing tools. • 2019 – Completed a transient analysis.
vi. Improve the odour management system at the NBPCC outfall manhole	Complete in 2013

Target: Expand and provide secondary treatment at GNPCC by 2018	
Commitment	**Progress**
i. Commission a third digester	Complete in 2013
ii. Construct a fourth primary sedimentation tank	Complete in 2013
iii. Upgrade the facility to provide secondary treatment by 2018	• Preliminary site preparation began in 2015 • Environmental Impact Study completed in 2015 • Geotechnical study completed in 2015 and showed that an extra six months of ground improvements is necessary to account for liquefiable soils on site • Engineering design was complete in 2016. • February 2016, the RDN notified the Ministry of a revised 2019 commissioning date. • Construction of the GNPCC Secondary Treatment Upgrade Project began in May 2017 and continued through 2018 (see photos below). Commissioning of some structures has begun and is scheduled for completion in 2020 • The Commissioning Plan, submitted to the Ministry on August 6, 2019, identifies a commissioning timeline from August 2019 to September 2020.
iv. Explore federal and provincial grant options to fund secondary treatment	RDN made the following requests for financial support for secondary treatment at GNPCC: • At the September 2013 UBCM Convention, the RDN requested financial assistance from the Province to help fund the secondary treatment upgrade projects at GNPCC and NBPCC • 2015, application to the Strategic Priorities Fund • 2016, application to the CWWF • Spring 2017 application to the Strategic Priorities Fund In March 2018 the RDN was awarded $6 million in Federal Gas Tax Funds to assist with the $82 million GNPCC Secondary Treatment Upgrade Project

Target: Provide secondary treatment at NBPCC by 2023	
Commitment	**Progress**
i. Upgrade the facility to provide secondary treatment by 2023	Conceptual design of secondary treatment upgrade began in 2019
ii. Explore federal and provincial grant options to fund secondary treatment	• At the September 2013 UBCM Convention, the RDN requested financial assistance from the Province to help fund the secondary treatment upgrade projects at GNPCC and NBPCC • In 2016, RDN applied to the CWWF to support the NBPCC Secondary Treatment Upgrade Project – application not successful • In 2018, applied to the Investing in Canada Infrastructure Program to support the NBPCC Secondary Treatment Upgrade Project – application not successful
Target: Expand capacity in wastewater infrastructure to respond to demands created by an increasing population	
Commitment	**Progress**
i. Expand FCPCC treatment plant capacity	• Preliminary design of the FCPCC expansion, completed in 2018, was funded by a $332,000 CWWF grant • In 2018, applied to the Investing in Canada Infrastructure Program to support the FCPCC Expansion and Odour Control Upgrade – application not successful • Detailed design of the FCPCC expansion began in 2018 and continued through 2019.
Target: Develop a sewer servicing strategy for the Nanoose Bay Peninsula	
Commitment	**Progress**
i. Coordinate with Development Services through the OCP review process to identify property owners in growth containment boundaries who are interested in establishing public wastewater services	The Last Electoral Area E OCP was completed in 2005. Development Services has not led an Area E OCP review since then.
ii. Consider resource recovery, visual, and olfactory buffers and the number of pump stations required	Still to come
iii. Review and update the Fairwinds sewer servicing agreement and DCC bylaw for the Nanoose Bay area	Still to come

Target: Develop a DCC bylaw to allow new connections to use existing capacity at DPPCC	
Commitment	**Progress**
i. Develop a DCC bylaw to allow properties in the growth containment area to purchase capacity at DPPCC	The Cedar Village Sewer Servicing Study reviewed the potential for properties in the growth containment area to purchase capacity at DPPCC. DCCs were considered in the DPPCC Cost and Capacity Review which began in August 2015 and completed in 2017 (revised from 2016)
Target: Review DCC plan every year and revise bylaws where necessary to fund anticipated projects	
Commitment	**Progress**
i. Revise DCC bylaws at GNPCC, NBPCC, and FCPCC.	A review and update of the Southern (GNPCC) and Northern (FCPCC) Communities' Wastewater Development Cost Charges was started in 2015. DCC Amendment Bylaws Nos. 1547.01 and 1442.03 were adopted on June 27, 2017. Revised 2015-2017 (from 2015-2016)

Construction photographs of the GNPCC Secondary Treatment Upgrade Project are provided below.

Photo left: Secondary treatment area – bioreactors and clarifiers

Photo right: Primary treatment and solids handling area

4.10 Biosolids

Biosolids are stabilized municipal sewage sludge resulting from a municipal wastewater treatment process that meets quality criteria for beneficial use under the Organic Matter Recycling Regulation.

GNPCC treats sludge from its operations as well as sludge trucked from the DPPCC that has undergone secondary treatment. Likewise, FCPCC treats sludge from its operations as well as sludge trucked from NBPCC that has undergone primary treatment. In 2019, the RDN produced and beneficially reused a total of 5,660 tonnes of biosolids.

Since 1999, RDN biosolids have been beneficially used in agriculture, landfill closures, mine reclamation and forestry applications. Biosolids provide an alternative to chemical fertilizers as a means to improve soil fertility where nutrients are limited.

Photo: trees receiving biosolids applications have longer and greener (healthier) needles (photo credit SYLVIS Environmental).

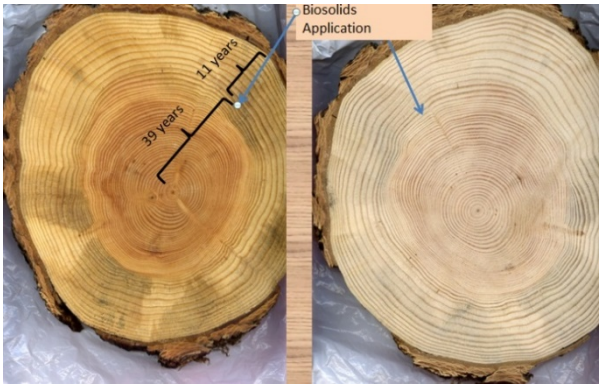

Photo: trees receiving biosolids applications grow much faster than controls that have not had biosolids treatments (photo credit Vancouver Island University).

Since 2003, RDN biosolids have been used in a Forest Fertilization Program on land privately owned by TimberWest (leased to Vancouver Island University until May 2017). Biosolids are managed and applied according to a Land Application Plan prepared annually by SYLVIS Environmental in adherence to the British Columbia Organic Matter Recycling Regulation (OMRR). Through this program, RDN biosolids are diverted from the landfill and applied to the forest lands to improve tree growth.

This program demonstrates modern practices in forest ecology and stand management. Applications combine the initial fertilization benefits of biosolids with long-term benefit through soil conditioning, as the surface-applied biosolids become incorporated into the surface organic matter (humus) that develops over time. Biosolids provide improved productivity through nutrient input, improved water holding capacity, and increased organic matter through application to the forest.

Industry best practice recommends a biosolids management program have a biosolids contingency site. Previously, the Regional Landfill was used as the contingency site when the forest lands were not accessible due to winter conditions. In 2017, the RDN established a contingency biosolids management site at the Harmac mill so biosolids can continue to be beneficially used during times where the TimberWest lands is inaccessible (i.e. winter road conditions). At the Harmac site, RDN biosolids, Harmac wood waste, and mineral soil are used to fabricate soil for cover material for the Harmac landfill during is landfill closure activities.

In 2019, the RDN won the Northwest Biosolids ‘Excellence in Biosolids’ Award. This award recognizes significant contributions to the development and implementation of cost-effective and environmentally beneficial biosolids management practices. The RDN won this award previously in 2013.

The LWMP Biosolids Program objective is to continue producing and beneficially using biosolids. Progress towards the LWMP commitments is summarized in Table 12.

Table 11. Biosolids Program Commitments

Target: Produce, at minimum, Class B biosolids	
Commitment	**Progress**
i. Develop a Biosolids Management Plan to assess options for the beneficial use of RDN biosolids, including land application, energy generation, and other possible resource recovery strategies	A Biosolids Management Plan was completed in 2011. A Biosolids Options Study was completed in 2016 and appended to the 2016 LWMP Annual Report. A Site Optimization Study was completed in 2018.
ii. Improve the quality of biosolids through upgrades to wastewater treatment infrastructure and innovative technologies and techniques (i.e. decrease volatile solids content and pathogen concentrations)	Biosolids quality may improve with the secondary treatment upgrades at GNPCC (2020) and NBPCC (2023).
iii. Monitor and report biosolids quality according to operational certificate/discharge permit and OMRR	RDN Biosolids met OMRR requirements in 2019. Annual reports for the biosolids program are prepared separately. The 2019 Biosolids Management Summary was prepared by SYLVIS Environmental.
iv. Establish a contingency plan for temporary storage or application of biosolids if the VIU site is not useable	Previously, the Regional Landfill was used as the contingency site when the forest lands were not accessible due to winter conditions. In 2017, the RDN established a contingency site at the Harmac mill where RDN biosolids, Harmac wood waste, and mineral soil are used to fabricate soil for cover material that will be used during the closure of the Harmac landfill.
Target: Enhance the biosolids-based education and outreach program	
Commitment	**Progress**
i. Develop and distribute information on source control in order to improve biosolids quality	• See section on Source Control • The RDN's website www.rdn.bc.ca/biosolids posts material to increase awareness of the application area, regulations, monitoring and research including surface water quality monitoring reports and groundwater studies • In 2003 and 2012, the RDN completed groundwater impact assessments that concluded that past and proposed future application of biosolids within the Biosolids Application Area will not impact groundwater quality in any of the wells located in the region • In 2015, the RDN developed a brochure on Biosolids. • Biosolids open houses for the Nanaimo Mountain Bike Club (NMBC) were held in August 2014, October 2015, and April 2018 • In 2017, the RDN and NMBC signed an agreement to coordinate land use to establish mountain biking reserves,
ii. Develop material to increase awareness of precautions taken to ensure the storage and application of biosolids do not negatively impact groundwater	
iii. Continue working with local user groups to communicate plans for biosolids application areas	
iv. Provide educational material and outreach at open houses and other events.	

	biosolids application reserves and areas of integrated use
	• Biosolids educational materials were available at the FCPCC open house on
	  ○ May 9, 2015
	  ○ April 30, 2016
	  ○ June 2, 2018
	  ○ June 8, 2019
	• Biosolids educational materials were available at the GNPCC open house on
	  ○ April 30, 2014
	  ○ February 10 & 11, and July 8, 2015
	  ○ June 11, 2016
	  ○ Open houses were not offered in 2017 to 2019 during construction

4.11 Resource Recovery

The Resource Recovery Program objective is to economically recover and utilize resources in wastewater. Progress towards the LWMP commitments is summarized in Table 11.

Table 12. Resource Recovery Program Commitments

Target: Reduce resource consumption at wastewater treatment facilities	
Commitment	**Progress**
i. Complete a study to review resource recovery opportunities at RDN wastewater facilities	Resource recovery is integrated into GNPCC Secondary Treatment design (100% Design completed in 2017). The final design includes a water system to reuse effluent in mechanical processes that do not result in operator exposure, an increase in the production of biogas, and an increase in the use of biogas as an energy source for the boilers. The heat will be transferred through the hydronic system to heat the occupied spaces and the treatment process
ii. Evaluate wastewater treatment operations which require energy, water, chemicals or fuel and identify activities that can be run more efficiently, if any	Energy, water, chemical and resource consumption are reviewed annually. As part of the National Water and Wastewater Benchmarking Initiative, Wastewater Services compares its data to other facilities across Canada of similar size to monitor performance and identify areas to improve efficiency
Target: Recover resources from wastewater	
Commitment	**Progress**
i. Commission a cogeneration facility for biogas recovery and energy generation at GNPCC	Complete 2012
ii. Continue to beneficially use biosolids according to the Biosolids Program	• Since 1999, RDN biosolids have been beneficially used in agriculture, landfill closures, mine reclamation and forestry

	applications. • In 2019, the RDN produced and beneficially used 5,660 tonnes of biosolids
iii. Reclaim water for use onsite in compliance with MOE guidelines (MOELP 2001)	• FCPCC uses treated effluent as process and wash water in place of potable water. • Upgrades to GNPCC in 2019 incorporated the reuse of treated effluent in mechanical processes that do not result in operator exposure.
iv. Discuss future opportunities for reclaimed water use with Morningstar Golf Course	Until 2014, treated effluent was sent to Morningstar Golf Course in the summer months for irrigation. In 2019, delivery of treated effluent to Morningstar Golf Course resumed.
v. Consider potential resource recovery options for new projects, particularly through process selection	The GNPCC Secondary Treatment design uses treated effluent in process water in place of potable water
vi. Examine opportunities for a district heating project at Hammond Bay Elementary using the GNPCC outfall	In 2014 the RDN installed two stubs into the new effluent outfall line to facilitate easy connection for the proposed School District 68 district heating project. The outfall replacement project was completed in 2016. In 2017, School District 68 received funding from the Carbon Neutral Action Program and School Enhancement Program for the project.
vii. Examine opportunities for using reclaimed water for the Fairwinds Golf Course.	Still to come

5) Emerging Issues

The LWMP recognizes that new issues may emerge from innovations in water quality monitoring and from an evolving regulatory environment. The LWMP commits to keeping informed on the emerging issues listed below.

- Shellfish Harvesting Areas
- Contaminants of Emerging Concern
- Heritage Resources
- Climate Change
- Non-point Sources of Pollution

5.1 Shellfish Harvesting Areas

The Canadian Shellfish Sanitation Program (CSSP) is a federal food safety program, jointly administered by the Canadian Food Inspection Agency, Environment Canada, and Fisheries and Oceans Canada (DFO). The purpose of the program is to provide assurance that bivalve molluscan shellfish (e.g. mussels, oysters, and clams) meet food safety and quality standards for both domestic and international markets, thereby protecting the public from the health risks of consuming contaminated shellfish.

Under the CSSP, Conditional Management Plans may be developed to allow shellfish harvesting in areas in proximity to wastewater infrastructure. These areas meet the standards for safe harvest of bivalve molluscan shellfish (i.e. mussels, oysters, and clams), except in times where a temporary source of pollution exists. As long as the pollution source is not present, the Conditional Management Plan allows the shellfish harvesting area to remain open.

The RDN currently operates with a Conditional Management Plan for two pump stations that have bypasses. The bypasses are designed to allow untreated wastewater to discharge to the marine environment if the volume of wastewater entering the interceptor exceeds the capacity of the pump station. Bypasses prevent damage to infrastructure and reduce the risk of flooding private residences. These bypasses have been in place since the system was built in the 1970's and during this time there has been no reported need to bypass the flow. Furthermore, pump redundancy, back-up power, and a Supervisory Control and Data Acquisition System make it unlikely that an overflow would occur at these locations. RDN's Conditional Management Plan clearly outlines the roles and responsibilities of each partner, as well as immediate actions to be taken to close these conditionally classified areas should a discharge of untreated wastewater occur from the pump station bypasses. These plans clearly identify what events will trigger a temporary closure of the area and what response protocol would follow if a trigger event was to occur.

The RDN's Conditional Management Plan came into effect in 2015 and was renewed in 2016 and 2019.

5.2 Contaminants of Emerging Concern

Contaminants of emerging concern, sometime called emerging contaminants, refer to an array of pharmaceuticals, personal care products, and industrial contaminants (CCME 2009). Once standards are established by higher levels of government for the identification, testing, and measurement of contaminants, the RDN will develop a strategy to mitigate their impact on the wastewater stream. Recognizing that most of the contaminants entering the wastewater stream originate from private residences and businesses, the RDN will continue to work to improve the quality of effluent through the Source Control Program, the Sewer Use Regulatory Bylaw, and through strategic investments in critical infrastructure.

In 2018, the RDN commissioned advisory memorandum on Emerging Substances of Concern (ESOCs) and microplastics, included in that year's annual report.

5.3 Heritage Resources

The Province protects heritage sites through the *Heritage Conservation Act*. This protection applies to both private and Crown land and a provincial heritage permit is required before altering or developing a heritage site. In 2018, the RDN applied for a Blanket Archaeological Permit from the Archaeology Branch. A Blanket Permits is a Heritage Inspection Permit that covers a broad geographic area for multiple assessments. The RDN's Blanket permit was granted May 6, 2019 and expires December 30, 2020. In 2019, the RDN applied for a second Blanket Archaeological Permit with a different archaeology firm.

5.4 Climate Change

Sea level rise is driven by a global increase in average temperature which is causing glacier and ice caps to melt, and the expansion of ocean waters. At the regional and local scale, sea level rise will differ and

change in response to these global effects. For the east coast of Vancouver Island, the mean sea level rise is estimated to increase by least 0.8 m by the year 2100[4]. Potential impacts associated with these changes include:

- More frequent and extreme high water levels in coastal areas
- Increased erosion and flooding
- Increased risk to coastal infrastructure, as well as increased maintenance and repair costs
- Loss of property due to erosion
- Loss of habitat and reduced biodiversity
- Saltwater intrusion into coastal aquifers
- Loss of cultural and historical sites.

5.4.1 Sea Level Rise Adaptation

The RDN is preparing for sea level rise through the Sea Level Rise Adaptation Program. Progress is as follows:

- 2015: Terms of Reference completed
- 2017: the RDN acquired the LIDAR data (with a $10,000 contribution from Wastewater Services)
- 2017: the RDN was awarded a $150,000 grant to acquire coastal floodplain mapping
- 2018-2019: Coastal flood hazard mapping.

The coastal flood hazard mapping information was used to update the Floodplain Management Bylaw No. 1469 in 2018. This will inform future decisions relating to land use, servicing and emergency preparedness planning, and infrastructure planning and adaptation. More information is available at: https://www.rdn.bc.ca/sea-level-rise-adaptation-program.

5.4.2 Departure Bay Pump Station Vulnerability Assessment

In 2019, Wastewater Services invested $15,000, with the aid of an Infrastructure Planning Grant, to investigate the vulnerability of the Departure Bay Pump Station to the effects of sea level rise. The study is underway and scheduled for completion in 2020.

5.5 Non-Point Sources of Pollution

Non-point sources of pollution come from sources other than an outfall pipe. Some examples of non-point pollution include agricultural and stormwater runoff, onsite sewage systems, and discharges from vessels.

- The LWMP Private Onsite Systems Program addresses pollution from onsite sewage systems.
- The RDN also has agreements with BC Ferries to establish a pump ashore program at GNPCC and DPPCC to accommodate the wastewater produced on BC Ferries and Seaspan vessels.

[4] BC Ministry of Environment. 2011 *Climate Change Adaption Guidelines for Sea Dikes and Coastal Flood Hazard Land Use - Guidelines for Management of Coastal Flood Hazard Land Use*. By Ausenco Sandwell. Accessed June 17, 2019 from http://www.env.gov.bc.ca/wsd/public_safety/flood/pdfs_word/coastal_flooded_land_guidelines.pdf.

6) Revisions and Adjustments

The Liquid Waste Management Plan states that the LWMP Monitoring Committee may recommend refinements to the actions to keep implementation on track with the overall objectives and targets. Refinements may also reflect lessons learned from other jurisdictions through communication and benchmarking exercises. Refinements are not considered an amendment or update. Rather, annual review and refinement will provide the flexibility to sustainably manage wastewater and respond to changes such as the pace of development, technical issues, study results, regulatory changes, requests from the public and Board, and availability of funding and grants. Refinements to the LWMP are summarized below.

6.1 Public Wastewater Systems

The LWMP identifies an action to draft a bylaw to allow properties with failing onsite systems to connect to sewer services, where available. Implementation of such a bylaw requires the modification of several bylaws, some which are not implemented by Wastewater Services. Instead of a bylaw, the RDN will continue to assess properties case by case. Creation of a guide that walks homeowners through the sewer connection application process is scheduled for 2021 to 2022.

6.2 Private Onsite Systems

The LWMP identifies and action item to:

- Review and revise the Pump & Haul Local Service Establishment Bylaw (No. 975) and the Sewage Disposal Regulation Bylaw (No. 1224) so only grandfathered properties and properties with failed onsite systems qualify for the septage receiving rate reduction, and
- Work with VIHA and Building Inspection Services to limit holding tanks on new developments.

Holding tanks are permitted by Island Health and the authority to limit pump and haul tanks lies with the Province. When addressing the action items above, it became clear that the role of Wastewater Services is to set quality standards and establish a rate structure for wastewater treatment. To this extent, in 2017, the RDN repealed Bylaws No. 975, 988, 1217, and 1224 and replaced them with Bylaw No. 1732 which establishes the quality criteria and rate structure for wastewater treatment. Key points are summarized in Appendix C of the 2016 LWMP Annual Report.

RDN Wastewater Services will work with Island Health in the future if there are efforts led by that agency to limit holding tanks.

6.3 Pollution Control Centres

The LWMP says that the RDN will expand and provide secondary treatment at GNPCC by 2018. According to the revised timeline, GNPCC will provide secondary treatment by 2020. Project progress is summarized in Section 4.9 and rationale for the updated schedule includes:

- A geotechnical study completed in 2015 showed that an extra six months of ground improvements was necessary to account for liquefiable soils on site. The completion of ground improvements extended the project timeline to 2019.

- The contractor was not able to complete the project in 2019. The revised completion date GNPCC Secondary Treatment Upgrade Project is fall 2020.

Communication of the revised timeline includes:

- A letter to the Ministry was sent in February 2016 to identify the new timeline with a revised 2019 commissioning date.
- The Commissioning Plan, submitted to the Ministry on August 6, 2019, identifies a commissioning timeline from August 2019 to September 2020.
- The project website, now located at https://www.getinvolved.rdn.ca/gnpcc-upgrade, provides regular Notice to Residents and an updated timeline.

7) Audit Summary

An independent auditor completed a 5-year performance audit that covered the RDN LWMP from plan approval in October 2014 to December 31, 2019.

The LWMP Audit identified 118 Commitments in the 10 LWMP program areas, five emerging issues and two approval conditions. Some of the commitments were complete by the time the LWMP was finalized. Other commitments are met, in progress, or scheduled for the future. Of the 118 commitments, there was evidence that:

- 101 have been met (86%)
- 6 were in progress (5%)
- 11 were behind schedule (9%).

The audit found that most of the 11 commitments that were behind schedule were items not in the direct control or the specific responsibility of Wastewater Services, or the commitment had a time-related deadline that was exceeded.

The completed audit is included in Appendix A.

7.1 Audit Recommendations

The audit recommended that, if the commitments in the 2014 LWMP are updated in the future, that certain items remain on-going, but items which are not under the direct control of Wastewater Services should be removed or revised. It also recommended that the RDN should continue to focus on assessing emerging issues and communicating with the public through open houses, workshops and other meetings.

8) Outstanding Commitments

The audit showed that 101 of the LWMP commitments are met and 17 commitments are in progress or behind schedule. The 17 outstanding commitments are summarized in Table 13. The status these commitments is provided in the schedule column.

Table 13. Summary of Outstanding Commitments

Program	#	Commitment	Schedule
Public Wastewater Systems	1.2.ii	Improve public awareness of areas which may connect to RDN sewer systems for health and environmental reasons (failing onsite system) and create a guide which walks homeowners through the sewer connection application process.	2021 to 2022
	1.2.iv	Develop a webpage to inform the public of historic sewer servicing studies and of the criteria for the provision of future sewer services.	2021 to 2025
Private Onsite Systems	2.2	Work with Development Services to adopt draft changes to Land Use and Subdivision Bylaw (No. 500) which would enable the RDN to acquire privately-owned onsite systems serving at least 60 parcels, if petitioned	2020 to 2025
Rainwater Management / Drinking Water and Watershed Protection	5.1.i	Collaborate with Development Services, Water Services, Energy & Sustainability Services, and member municipalities to create a Rainwater Management Plan	2021 to 2022
	5.1.v	Subject to Board approval of the Rainwater Management Plan, Wastewater Services and Water Services will coordinate the plan, administer the budget, and oversee collaboration with other departments and jurisdictions	After above is complete
Inflow & Infiltration	7.3.i	Design upgrades to RDN infrastructure so flows up to 2 times ADWF will receive secondary treatment and all flows in excess of this amount will receive primary treatment	GNPCC – complete in 2017 NPBCC – 2022 (commitment is for design)
	7.5.i	Enhance the source control program to encourage landowners to check gutters and outside drains for connection to the sewer system, avoid planting trees and shrubs over sewer laterals, ensure basement drains and sump pumps are not connected to the sanitary sewer, and replace broken or leaky pipes located on private property	2021 – Apply for infrastructure planning grant. 2021 to 2022 – If grant awarded, hire consultant to complete Homeowner's Best Practices Guide in consultation with W3C.
	7.5.ii	Consider providing incentives to enable residents to reduce private property I&I.	Complete – Considered using DCC funds to address I&I but this is not possible under the current funding model. Will support efforts led by member municipalities to reduce I&I on private property.

Program	#	Commitment	Schedule
Pollution Control Centres	8.3.iii	Upgrade GNPCC to provide secondary treatment by 2018	2020
	8.4.i	Upgrade NBPCC to provide secondary treatment by 2023	2023
	8.5.i	Expand FCPCC capacity	2023
	8.6.i	Coordinate with Development Services through the OCP review process to identify property owners in growth containment boundaries who are interested in establishing public wastewater services	As scheduled by Development Services
	8.6.ii	[For NBPCC] Consider resource recovery, visual, and olfactory buffers and the number of pump stations required	2021 to 2023 (during detailed design)
	8.6.iii	Review and update the Fairwinds sewer servicing agreement and DCC bylaw for the Nanoose Bay area	2021 to 2023 (during detailed design)
	7.i	Develop a DCC bylaw to allow properties in the growth containment area to purchase capacity at DPPCC	2021 to 2023
Resource Recovery	9.2 vii	Examine opportunities for using reclaimed water for the Fairwinds Golf Course.	2020 to 2023
Biosolids	10.1.ii	Improve the quality of biosolids through upgrades to wastewater treatment infrastructure and innovative technologies and techniques (i.e. decrease volatile solids content and pathogen concentrations)	2020 to 2030 – exploring opportunities for composting biosolids

Appendix A – LWMP External Audit

5-YEAR PERFORMANCE AUDIT OF LIQUID WASTE MANAGEMENT PLAN COMMITMENTS

FINAL REPORT

Prepared for:

Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, BC V9T 6N2

Prepared by:

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Project No.:

2020-651

March 6, 2020

March 6, 2020
Project No. 2020-651

TABLE OF CONTENTS

1 Introduction 1
2 Scope of Work 1
3 Methodology 2
4 Auditor 2
5 Progress on LWMP Commitments 3
6 Commitments Behind Schedule and Possible Causes 5
7 Recommendations 6
8 Limitations and Closure 6

1 INTRODUCTION

Blackbird EHS Consulting Services Inc. (Blackbird) is pleased to provide this final report of a 5-year performance audit of the commitments found in Regional District of Nanaimo's (RDN) Liquid Waste Management Plan (LWMP). The LWMP states that an independent audit will be completed every five years. An audit is required in 2020 to capture LWMP implementation from plan approval on October 30, 2014 to December 31, 2019.

2 SCOPE OF WORK

The scope of the work for the performance audit covered the 2014-2019 RDN Liquid Waste Management Plan (LWMP). The LWMP outlines 111 commitments in 10 LWMP Program areas:

1. Public Wastewater Systems Program
2. Private Onsite Systems Program
3. Source Control Program
4. Odour Control Program
5. Rainwater Management / Drinking Water & Watershed Protection Program
6. Volume Reduction Program
7. Inflow & Infiltration Program
8. Pollution Control Centres Program
9. Resource Recovery Program
10. Biosolids Program

The LWMP also makes a commitment to stay current on five emerging issues. These include:

1. Shellfish Harvesting Areas
2. Contaminants of Emerging Concern
3. Heritage Resources
4. Climate Change
5. Non-point Sources of Pollution.

Additionally, there are two approval conditions assigned by the BC Ministry of Environment and Climate Change Strategy:

1. Within 30 days of receipt of this letter, provide terms of reference, plan and schedule for completion of Stages 1 & 2 of an Environmental Impact Study for each of the GNPCC, NBPCC and French Creek Pollution Control Centre (FCPCC) sewage treatment and disposal facilities.
2. By January 31, 2015, provide the Environmental Impact Study for the marine portion of the GNPCC outfall replacement project.

3 METHODOLOGY

The audit was conducted according to standard audit methodology, with the following activities:

- Telephone project kick-off meeting held with RDN staff on January 27, 2020
- RDN uploaded audit documentation to website
- Documentation was reviewed to assess progress on each commitment
- Telephone meeting with RDN to discuss audit evidence on February 5, 2020
- Questions/additional information requested from RDN
- RDN responded with additional information/documentation
- Additional information/documentation was reviewed
- Site visit to RDN offices for interviews and discussion on commitments on February 18, 2020
- Draft report prepared March 2, 2020

A list of documentation reviewed as part of the evidence to verify if the commitment has been met is found in Appendix A.

Audit evidence and progress towards meeting commitments was tracked on an Excel spreadsheet for each specific commitment within the 10 program areas, five emerging issues and two approval conditions (118 items total).

As previously mentioned, the audit covered the period from October 30, 2014 to December 31, 2019 although some commitments were met prior to 2014.

4 AUDITOR

Mr. Michael W. Herald, CRSP, EP(CEA), EP(EMSLA) was the Project Manager and Lead Auditor for this project. He is the primary investigator at Blackbird EHS Consulting Services Inc. (www.blackbirdehs.ca) and has worked as an environmental, health and safety consultant for over 32 years. He is an Environmental Management Systems Lead Auditor EP(EMSLA), Certified Environmental Compliance Auditor EP(CEA), and Canadian Registered Safety Professional (CRSP) in Canada. He is also trained as a US EPA Asbestos Building Inspector and Asbestos Project Designer.

He is also a Certified Auditor for the:

- Certificate of Recognition (COR) Health & Safety Management System Program for transportation and warehousing industries as administered by the Trucking Safety Council of BC
- Occupational Safety Standard of Excellence (OSSE) for manufacturers and food processors in British Columbia administered by the FIOSA-MIOSA health and safety association
- Verifier for the International Green Marine Environmental Program

His experience is primarily in leading and participating on hundreds of environmental, health and safety audits, and in conducting safety management system (SMS) assessments world-wide. He has taught courses in EHS auditing and management systems. Mr. Herald is currently on the Board of Directors of the Auditing Association of Canada (AAC) and past president of the Environmental Managers Association of BC (EMA of BC). He has conducted audits and assessments in Canada, United States, Mexico, Ecuador, Saudi Arabia, South Africa and Macedonia.

5 PROGRESS ON LWMP COMMITMENTS

After review of all audit evidence, each commitment was assigned progress codes. The commitment progress codes and their definitions are provided below:

Behind Schedule
←←

Action towards the commitment did not get completed by a specific deadline, or is not included in any staff's work plans.

In Progress
→→

Some progress has been made or action towards the commitment has been scheduled. Work has yet to be completed.

Met - Adjusted
✓≠

The LWMP commitment was modified to better align with the responsibilities of the RDN and was subsequently met.

Met
✓=

There is evidence that the commitment had been satisfied according to the specifications in the LWMP. Many of these had a specific measurable target that needed to be completed by December 31, 2019

Met - Ongoing
✓→

There is evidence that the commitment had been satisfied according to the specifications in the LWMP and RDN has ongoing programs for the particular commitment.

The results of the audit are summarized in the following table.

				COMMITMENT MET		
		Behind Schedule	**In Progress**	**Met - Adjusted**	**Met**	**Met - Ongoing**
	LWMP Commitments by Program Area	← ←	→ →	✓ ≠	✓ =	✓ →
	Approval Conditions	0	0	0	2	0
1	Public Wastewater Systems	2	0	1	2	2
2	Private Onsite Systems	1	0	2	2	3
3	Source Control	0	0	0	2	11
4	Odour Control	0	0	0	8	2
5	Rainwater Management / Drinking Water and Watershed Protection	2	0	0	0	11
6	Volume Reduction	0	0	0	3	6
7	Inflow and Infiltration	0	3	0	4	7
8	Pollution Control Centres	5	2	0	11	2
9	Resource Recovery	1	0	0	2	6
10	Biosolids	0	1	0	3	4
	Emerging Issues	0	0	0	0	5
	TOTALS	**11**	**6**	**3**	**39**	**59**
		TOTAL COMMITMENTS MET		**101**		

Of the 118 commitments included in the 10 LWMP program areas, five emerging issues and two approval conditions, there was evidence that 101 have been met (86%), six were in progress (5%) and eleven were behind schedule (9%).

Detailed information on the progress of each commitment can be found in Appendix B.

6 COMMITMENTS BEHIND SCHEDULE AND POSSIBLE CAUSES

Most of the 11 commitments found to be behind schedule and not met were items not in the direct control or the specific responsibility of the Wastewater Services division of the RDN, or the commitment had a time-related deadline that was exceeded (e.g., 5-year period up to December 31, 2019). These issue areas and possible causes for not meeting the commitments are explained below:

Commitment Issue Area Behind Schedule	Possible Cause for Not Meeting Commitment
Successful modification of certain bylaws related to wastewater, trucking or septic systems.	Bylaw modifications are not in the direct control of the Wastewater Services division of the RDN, and have to approved by council. Other studies are still needed before changes to bylaws can be considered.
Coordinate with others during the Official Community Plan (OCP) Review Process	No OCP reviews have been done for electoral areas since 2014, except for Area H.
Meeting commissioning of new treatment works by December 31, 2019.	Delays were not expected when commitment was developed in 2014. Commissioning in process, but did not meet deadline.
Having conceptual designs for projects, but not pursuing any further actions (e.g., odour control in areas where there are no complaints).	Relatively little benefit to pursue issue. More immediate concerns identified.
Websites not fully populated with required information by December 31, 2019.	Deadline not met, but website upgrades in progress.
Rainwater Management Plan not developed by December 31, 2019.	Requires collaboration with other jurisdictions, but Working Groups have been established. This will be done in coordination with Drinking Water and Watershed Protection (DWWP) Program update.
Commitment (e.g., enforcement of bylaws) is actually a municipal responsibility.	Enforcement of bylaws is done by individual municipalities and not a Wastewater Services division responsibility.

7 RECOMMENDATIONS

If the commitments in the 2014 LWMP are being updated, it is recommended that certain items should remain on-going, but those that are not under the direct control of the RDN Wastewater Services division should be removed or revised.

RDN should continue to focus on assessing emerging issues and communicating with the public through open houses, workshops and other meetings.

8 LIMITATIONS AND CLOSURE

The purpose of this audit was to assess conformance against the audit criteria. The audit consisted of evaluating a sample of practices and was conducted in a relatively short span of time. Efforts were directed toward sampling major facets of performance; however the audit may have not identified all potential problems. Information obtained through interviews was verified where records existed. This report is not meant to imply legal certification of compliance or non-compliance with all or other regulatory requirements, applicable practices, or otherwise. Blackbird's use of standardized, internationally-accepted procedures and qualified personnel is intended to reduce the risk of errors and omissions during an audit as much as possible.

This report was prepared for the exclusive use of the Regional District of Nanaimo for the specific application and the stated scope of work. Any use which a third party makes of this report, or any reliance or decisions made based on it, are the responsibility of such third parties. Blackbird is not responsible for any action or inaction to address or resolve audit findings identified in this report. The audit was conducted in accordance with accepted professional practices. No other warranty, expressed or implied, is made.

Respectfully submitted,

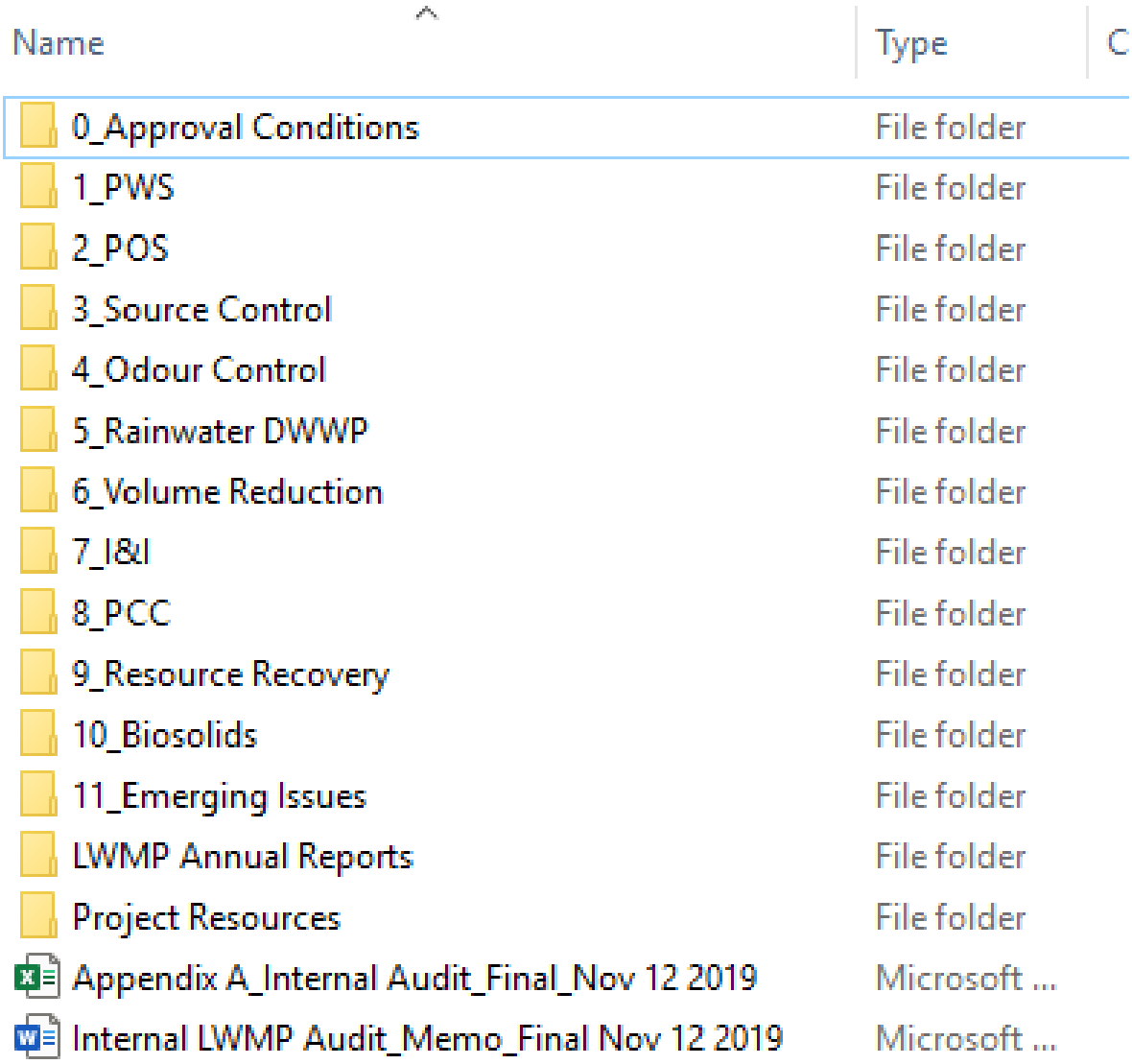
Blackbird EHS Consulting Services Inc.

Michael W. Herald, EP(EMSLA), EP(CEA), CRSP
Lead Auditor
MH/mh


BLACKBIRD
EHS CONSULTING SERVICES INC.

Appendix A – Audit Documents

Folder Structure



Approval Conditions

Name	Type	Compress...
0.1 Letter to MOE LWMP Approval Condition Nov 2014	PDF File	2,264 KB
0.2 Letter to MOE LWMP Approval Condition2_Jan 2015	PDF File	575 KB

Public Wastewater Systems Program

Name	Type	Compressed size
1.1.1 rural_village_centres_study_2013	PDF File	8,190 KB
1.1.2 bowser_village_wastewater_servicing_design_report_2017	PDF File	18,669 KB
1.1.2 DPPCC Capacity Cost Review 2016	PDF File	504 KB
1.1.3 Official_community_plan_Electoral Area H_2017	PDF File	1,267 KB
1.2.2 Bylaw 1259 (Consolidated to .12)	PDF File	447 KB
1.2.2 Deb's Checklist for Connecting to Services	PDF File	909 KB

Private Onsite Systems Program

Name	Type	Compressed size
2.1.2 SepticSmart Presentation 2013	PDF File	1,189 KB
2.1.2 SepticSmart Presentation 2014	PDF File	601 KB
2.1.2 SepticSmart Presentation 2015	PDF File	3,924 KB
2.1.2 SepticSmart Presentation 2016	PDF File	4,171 KB
2.1.2 SepticSmart Presentation 2017	PDF File	3,627 KB
2.1.2 SepticSmart Presentation 2018	PDF File	4,065 KB
2.1.3_2014_FINAL SepticSmart News	PDF File	1,703 KB
2.1.3_2016_FINAL SepticSmart News	PDF File	1,789 KB
2.1.3_2017_FINAL SepticSmart News	PDF File	1,891 KB
2.1.3_2018_FINAL SepticSmart News	PDF File	2,374 KB
2.1.3_2019_FINAL SepticSmart News	PDF File	1,296 KB
2.1.4 Copy of SepticSmart Program Stats	Microsoft Excel 97-2003 ...	1,093 KB
2.1.5_2012 Mandatory Maintenance Feasibility Study	PDF File	6,489 KB
2.3.1_Bylaw 1732 Trucked Liquid Waste Rates and Regulations (2016) (consolidated to .01)	PDF File	358 KB
2.3.1_Bylaw 1752 Repeal RDN P&H Local Service Establishment Bylaw No. 975, 1995	PDF File	39 KB
2.3.2_Bylaw 1732 Trucked Liquid Waste Rates and Regulations (2016) (consolidated to .01)	PDF File	358 KB

Source Control Program

Name	Type	Compress...
3.2.3 SepticSmart Kit	File folder	
3.2.3 SepticSmart Presentations	File folder	
3.3.1 Discharge Permits	File folder	
3.3.1 Influent and Biosolids Monitoring	File folder	
3.1.1_Regional Sewage Source Control Bylaw 1730	PDF File	2,008 KB
3.1.2_Bylaw 1732 Trucked Liquid Waste Rates and Regulations (2016) (consolidated to .01)	PDF File	358 KB
3.1.3 BC Ferries Pumpashore Program S_ENV_SRV_11031715360	PDF File	675 KB
3.1.3 BC Ferries Pumpashore Program S_ENV_SRV_12091814180	PDF File	778 KB
3.2.2_2014 W3C Minutes April	PDF File	329 KB
3.2.2_2014 W3C Minutes October	PDF File	268 KB
3.2.2_2015 W3C Minutes March	PDF File	281 KB
3.2.2_2015 W3C Minutes Sept	PDF File	306 KB
3.2.2_2016 W3C Minutes March	PDF File	1,767 KB
3.2.2_2016 W3C Minutes Sept	PDF File	330 KB
3.2.2_2017 W3C Minutes April	PDF File	328 KB
3.2.2_2017 W3C Minutes September	PDF File	724 KB
3.2.2_20180302 W3C Minutes	PDF File	193 KB
3.2.2_20180914 W3C Minutes	PDF File	173 KB
3.2.2_20190315 W3C Minutes	PDF File	219 KB
3.2.4 Green Boating Practices	Microsoft ...	235 KB
3.2.4 Green Boating Practices	PDF File	220 KB
3.2.5 Joint Media Release	PDF File	77 KB
3.2.5 media-release-may-17-2016	PDF File	310 KB
3.2.5 RDN No Drainers Poster Hand Out	PDF File	346 KB

3.2.3 Septic Smart Kit

Name	Type	Compress...
RDN_Septic-Smart-Kit_Brochure_8.5x11_FNL	PDF File	688 KB
RDN_Septic-Smart-Kit_Brochure_8.5x11_no-bleed_FNL	PDF File	658 KB
RDN_Septic-Smart-Kit_Folder_9x12_FNL	PDF File	575 KB
RDN_Septic-Smart-Kit_Insert-1_8.5x9.5_FNL	PDF File	450 KB
RDN_Septic-Smart-Kit_Insert-1_8.5x9.5_no-bleed_FNL	PDF File	428 KB
RDN_Septic-Smart-Kit_Insert-2_8.5x10_FNL	PDF File	979 KB
RDN_Septic-Smart-Kit_Insert-2_8.5x10_no-bleed_FNL	PDF File	910 KB
RDN_Septic-Smart-Kit_Insert-3_8.5x10.5_FNL	PDF File	465 KB
RDN_Septic-Smart-Kit_Insert-3_8.5x10.5_no-bleed_FNL	PDF File	447 KB
RDN_Septic-Smart-Kit_Insert-4_8.5x11_FNL	PDF File	946 KB
RDN_Septic-Smart-Kit_Insert-4_8.5x11_no-bleed_FNL	PDF File	929 KB

3.2.3 SepticSmart Presentation

Name	Type	Compress...
Septic Smart 2009	Microsoft P...	19,359 KB
Septic Smart Cedar Nov 26 2008	Microsoft P...	19,097 KB
SepticSmart 2010	Microsoft P...	4,166 KB
SepticSmart 2012	Microsoft P...	9,892 KB
SepticSmart 2013	Microsoft P...	9,004 KB
SepticSmart 2014	Microsoft P...	11,615 KB
SepticSmart 2015	Microsoft P...	11,608 KB
SepticSmart 2016	Microsoft P...	14,939 KB
SepticSmart 2017Extension	Microsoft P...	14,954 KB
SepticSmart 2018	Microsoft P...	9,494 KB
SepticSmart 2019 - hr rev1	Microsoft P...	9,130 KB
SepticSmart VIREB NOV 4 2011	Microsoft P...	3,238 KB

3.3.1 Discharge Permits

Name	Type	Compress...
BC Ferries DB Waste Discharge Permit Feb 2015	PDF File	2,741 KB
BC Ferries DP Waste Discharge Permit Feb 2015	PDF File	2,731 KB
BC Ferries Nanaimo FT Discharge Permit Feb 2015	PDF File	2,772 KB
City of Nanaimo Discharge Letter May 2016	PDF File	379 KB
Epcor Discharge Permit WD-18001	PDF File	2,522 KB
Lehigh Hanson Materials Discharge Permit Dec 21 2016	PDF File	347 KB
Seaspan Discharge Permit WD-16002	PDF File	2,259 KB
Solid Waste Discharge Permit	PDF File	4,622 KB

3.3.1 Influent and Biosolids Monitoring

Name	Type	Compress...
DPPCC Annual Report 2014 - FINAL_Combined	PDF File	2,826 KB
DPPCC Annual Report 2015 - FINAL	PDF File	3,250 KB
DPPCC Annual Report 2016 - FINAL	PDF File	3,037 KB
DPPCC Annual Report 2017 - FINAL	PDF File	2,831 KB
DPPCC Annual Report 2018 - Final	PDF File	3,625 KB
FCPCC Annual Report 2014 - FINAL	PDF File	8,069 KB
FCPCC Annual Report 2015 - FINAL	PDF File	4,370 KB
FCPCC Annual Report 2016- FINAL	PDF File	4,181 KB
FCPCC Annual Report 2017- FINAL	PDF File	4,071 KB
FCPCC Annual Report 2018- FINAL	PDF File	6,265 KB
GNPCC Annual Report 2014 - FINAL	PDF File	4,252 KB
GNPCC Annual Report 2015 - FINAL	PDF File	4,356 KB
GNPCC Annual Report 2016 - FINAL	PDF File	4,673 KB
GNPCC Annual Report 2017 - FINAL	PDF File	4,883 KB
GNPCC Annual Report 2018- FINAL	PDF File	6,843 KB
Nanoose Annual Report 2014 - FINAL_Combined	PDF File	3,650 KB
Nanoose Annual Report 2015 - FINAL	PDF File	3,717 KB
Nanoose Annual Report 2016 - FINAL	PDF File	3,577 KB
Nanoose Annual Report 2017 - FINAL	PDF File	3,998 KB
Nanoose Annual Report 2018 - FINAL	PDF File	3,780 KB

Odour Control Program

Name	Type	Compress...
4.1.2 Intelex - Ion Generators	PDF File	144 KB
4.1.3 2018 Northern Communities Capital Projects and Scoping Sheets	Microsoft ...	31 KB
4.1.5 Intelex - Ion Generators	PDF File	144 KB
4.1.6 2013A Report 20130712 GNPCC Odour Study FINAL	PDF File	4,376 KB
4.1.6 GNPCC Secondary Treatment Odour Assessment Modeling 2015	PDF File	969 KB
4.1.7 2019 Northern Communities Capital Projects and Scoping Sheets	Microsoft ...	31 KB
4.1.8 FCPCC PrelimDesign Report_2017-08-16_mc	PDF File	1,790 KB
4.1.8 GNPCC 100% Design Report_20170407	PDF File	1,925 KB
4.1.8 GNPCC PrelimDesign Report Vol 1 Compilation_2015-11-18	PDF File	2,491 KB
4.3.1 DPPCC Annual Report 2014 - FINAL	PDF File	2,826 KB
4.3.1 DPPCC Annual Report 2015 - FINAL	PDF File	3,250 KB
4.3.1 DPPCC Annual Report 2016 - FINAL	PDF File	3,037 KB
4.3.1 DPPCC Annual Report 2017 - FINAL	PDF File	2,831 KB
4.3.1 DPPCC Annual Report 2018 - Final	PDF File	3,625 KB
4.3.1 FCPCC Annual Report 2014 - FINAL	PDF File	8,069 KB
4.3.1 FCPCC Annual Report 2015 - FINAL	PDF File	4,370 KB
4.3.1 FCPCC Annual Report 2016- FINAL	PDF File	4,181 KB
4.3.1 FCPCC Annual Report 2017- FINAL	PDF File	4,071 KB
4.3.1 FCPCC Annual Report 2018- FINAL	PDF File	6,265 KB
4.3.1 GNPCC Annual Report 2014 - FINAL	PDF File	4,252 KB
4.3.1 GNPCC Annual Report 2015 - FINAL	PDF File	4,356 KB
4.3.1 GNPCC Annual Report 2016 - FINAL	PDF File	4,673 KB
4.3.1 GNPCC Annual Report 2017 - FINAL	PDF File	4,883 KB
4.3.1 GNPCC Annual Report 2018- FINAL	PDF File	6,843 KB
4.3.1 NBPCC Annual Report 2014 - FINAL	PDF File	3,650 KB
4.3.1 NBPCC Annual Report 2015 - FINAL	PDF File	3,717 KB
4.3.1 NBPCC Annual Report 2016 - FINAL	PDF File	3,577 KB
4.3.1 NBPCC Annual Report 2017 - FINAL	PDF File	3,998 KB
4.3.1 NBPCC Annual Report 2018 - FINAL	PDF File	3,780 KB

Rainwater Management / Drinking Water & Watershed Protection Program

Name	Type	Compress...
5.0 DRAFT_RDN DWWP ACTION PLAN 2.0_for circulation to committee for review_Sept 5 2019	PDF File	475 KB
5.1.2 20151126 Rainwater WG meeting notes	Microsoft ...	34 KB
5.1.2 20160215 Rainwater WG meeting notes	Microsoft ...	42 KB
5.1.2 20180302 W3C Minutes_Rev1	PDF File	193 KB
5.1.2 20180914 W3C Minutes	PDF File	173 KB
5.1.2 Note from RMWG handover meeting with Jules Nov 3 2016	Microsoft ...	154 KB
5.1.2 W3C Minutes 2017 April 21 - Minutes	PDF File	328 KB
5.1.2 W3C Minutes March 2016-revised	PDF File	1,767 KB
5.1.2 W3C Minutes Sept 25 2015	PDF File	306 KB
5.1.2 W3C Minutes Sept 2016 Minutes - revised	PDF File	330 KB
5.1.2 W3C Revised Minutes March12 2015	PDF File	281 KB
5.1.3 Bylaw 500 Landuse and Subdivision Aug 2019	PDF File	37,720 KB
5.1.3 Bylaw 500 Landuse and Subdivision Dec 2018	PDF File	38,270 KB
5.1.3 EA F Zoning and Subdivision Bylaw 1285 Full Consolidations Dec 2018	PDF File	3,134 KB
5.1.3 Overcoming Barriers to Green Buildings in the RDN_2010	PDF File	2,651 KB
5.1.3 Rainwater Harvesting Guidebook_2012	PDF File	2,156 KB
5.2.2 surface_water_quality_trend_analysis_cwmn_2011-2017	PDF File	18,963 KB
5.2.3 rdn_regional_hydrometric_and_climate_monitoring_scoping_study_-_2015	PDF File	17,484 KB
5.2.4 10_year_action_plan_implementation_review_-_september_2018	PDF File	1,027 KB
5.2.5 water_conservation_evaluation_-_rdn_water_service_areas_only_-_2018	PDF File	3,435 KB

Volume Reduction Program

Name	Type	Compress...
6.1.4_2014 W3C Minutes April	PDF File	329 KB
6.1.4_2014 W3C Minutes October	PDF File	268 KB
6.1.4_2015 W3C Minutes March	PDF File	281 KB
6.1.4_2015 W3C Minutes Sept	PDF File	306 KB
6.1.4_2016 W3C Minutes March	PDF File	1,767 KB
6.1.4_2016 W3C Minutes Sept	PDF File	330 KB
6.1.4_2017 W3C Minutes April	PDF File	328 KB
6.1.4_2017 W3C Minutes September	PDF File	724 KB
6.1.4_20180302 W3C Minutes	PDF File	193 KB
6.1.4_20180914 W3C Minutes	PDF File	173 KB
6.1.4_20190315 W3C Minutes	PDF File	219 KB
6.1.5 DRAFT_RDN DWWP ACTION PLAN 2.0_for circulation to committee for review_Sept 5 2019	PDF File	475 KB
6.1.5 water_conservation_evaluation_-_rdn_water_service_areas_only_-_2018	PDF File	3,435 KB
6.2.1 Corporate Climate Change Plan	PDF File	10,881 KB
6.2.2 Green Building Policy	Microsoft ...	71 KB
6.3.1 RDN Nanaimo Interceptor Hydraulic Modeling Study	PDF File	4,180 KB

Inflow & Infiltration Program

Name	Type	Compress...
7.1.2 RDN Nanaimo Interceptor Hydraulic Modeling Study	PDF File	4,180 KB
7.2.1 2015 QB Interceptor Protection	PDF File	4,488 KB
7.2.1 2018 City of Nanaimo I-I Strategy_FINAL	PDF File	2,229 KB
7.2.1 2019 Draft Notice of Acceptance_Manholes and Interceptor repairs	Microsoft ...	28 KB
7.2.1 2019 QB Interceptor Protection	PDF File	13,307 KB
7.2.1 2019 RE_ GNPCC Northslope Manholes_from Rob	PDF File	90 KB
7.2.2 Chase River Forcemain Replacement and Pump Station Upgrades CWWF Application Form 2016	PDF File	466 KB
7.2.2 FCPCC Stage 4 Expansion Project and Odour Control Upgrades CWWF Application Form 2016	PDF File	482 KB
7.2.2 GNPCC Secondary Upgrades CWWF Application	PDF File	119 KB
7.2.2 GNPCC Secondary Upgrades CWWF Application Cover Letter	PDF File	289 KB
7.2.2 NBPCC Forcemain Replacement CWWF Application 2016	PDF File	113 KB
7.2.2 NBPCC Secondary Treatment Upgrade CWWF Application Form 2016	PDF File	471 KB
7.3.1 FCPCC 60% Design Report	PDF File	2,143 KB
7.3.1 GNPCC 100% Design Report_20170407	PDF File	1,925 KB

Pollution Control Centres Program

Name	Type	Compress...
8.1.2 2016 RDN REM Final Program Scope	PDF File	3,068 KB
8.1.2 2017 RDN REM Annual Summary Report	PDF File	7,756 KB
8.1.2 2017 RDN REM Conformity	PDF File	123 KB
8.1.2 2018 RDN REM Annual Report	PDF File	16,816 KB
8.2.1 Asset Management Review and Implementation Report 2019	PDF File	11,986 KB
8.2.1 Policy A2-21 Asset Management Policy 2016	PDF File	288 KB
8.2.3 Notice of Project Completion	PDF File	1,258 KB
8.2.3 Volume 1 - Design Report	PDF File	8,697 KB
8.2.3 Volume 2 - Design Report	PDF File	9,060 KB
8.2.4 GNPCC Outfall Upgrade_EIS _Marine 2015	PDF File	44,547 KB
8.2.4 GNPCC Outfall Upgrade_EIS_Land 2014	PDF File	12,553 KB
8.2.5 Departure Bay Force Main Condition Assessment Report 2018	PDF File	7,573 KB
8.2.6 2019 Northern Communities Capital Projects and Scoping Sheets	Microsoft ...	31 KB
8.3.1 GNPCC Third Digester Drawings Compiled HS Set	PDF File	16,217 KB
8.3.2 GNPCC Primary Sedimentation Tank 4 Record Drawings - March 2014 Half Size	PDF File	5,254 KB
8.3.3 20160217 Letter to MOE re LWMP Update	PDF File	1,415 KB
8.3.7 0_42_GNPCC Upgrade_CWWF Grant Application Cover 2016	PDF File	289 KB
8.4.2 NBPCC Secondary Treatment Upgrade CWWF Application Form 2016	PDF File	471 KB
8.5.1 FCPCC 60% Design Report_2019	PDF File	2,143 KB
8.5.1 FCPCC PrelimDesign Report_2017-08-16_mc	PDF File	1,790 KB
8.6.1 nanoose_bay_OCP_schedule_a_-_complete_text_document	PDF File	1,515 KB
8.7.1 2016_May DPPCC Capacity Cost Review	PDF File	504 KB
8.8.1 1442-0 (consolidated to .03) with schedules	PDF File	1,572 KB
8.8.1 1547 (consolidated to .01) schedules included	PDF File	2,246 KB
8.8.1 NBPCC DCC Bylaw	PDF File	129 KB

Resource Recovery Program

Name	Type	Compress...
9.1.1 GNPCC 100% Design Report_20170407	PDF File	1,925 KB
9.1.2 Benchmarking RDN-FC Min Max Graphs 2017_CONFIDENTIAL	PDF File	108 KB
9.1.2 Benchmarking RDN-GN Min Max Graphs 2017_CONFIDENTIAL	PDF File	315 KB
9.1.2 Benchmarking WWTP_GroupGraphs_17_CONFIDENTIAL	PDF File	689 KB
9.2.1 2009 GNPCC Cogen System Installation (AS-BUILTS)	PDF File	12,024 KB
9.2.4 2019 08 07 RE MGC - Resumption of Supply	Outlook It...	73 KB
9.2.5 Briefing Note - FCPCC September 2019	Microsoft ...	19 KB
9.2.5 GNPCC 100% Design Report_20170407 - Copy	PDF File	1,925 KB

Biosolids Program

Name	Type	Compress...
10.1.1 RDN Biosolids Management Options 2016	PDF File	655 KB
10.1.1 Strategic biosolids management review 2011	PDF File	729 KB
10.1.1 TimberWest Properties Biosolids Management Site Optimization 2018	PDF File	2,417 KB
10.1.3 Biosolids Annual Report 2014	PDF File	4,127 KB
10.1.3 Biosolids Annual Report 2015	PDF File	1,339 KB
10.1.3 Biosolids Annual Report 2016	PDF File	1,454 KB
10.1.3 RDN Biosolids Management Summary 2017	PDF File	599 KB
10.1.4 Harmac RDN Letter of Intent 20170320	PDF File	1,451 KB
10.2.1 2015 Biosolids Brochure	PDF File	738 KB
10.2.2 2003 Piteau Hydrology Report	PDF File	1,629 KB
10.2.2 2012 Piteau Hydrology Report	PDF File	1,692 KB
10.2.3 2017 Nanaimo Mountain Bike Club Biking Agreement	PDF File	1,439 KB

Emerging Issues

Name	Type	Compress...
11.1 12019-2022 French Creek WWTP CMP Final Nov 26 2018 with signatures	PDF File	6,622 KB
11.2 2018-01-24_ ESOC Advisory Support final-full	PDF File	651 KB
11.3 2019-0098 Blanket Archaeology Permit	PDF File	63 KB

LWMP Annual Reports

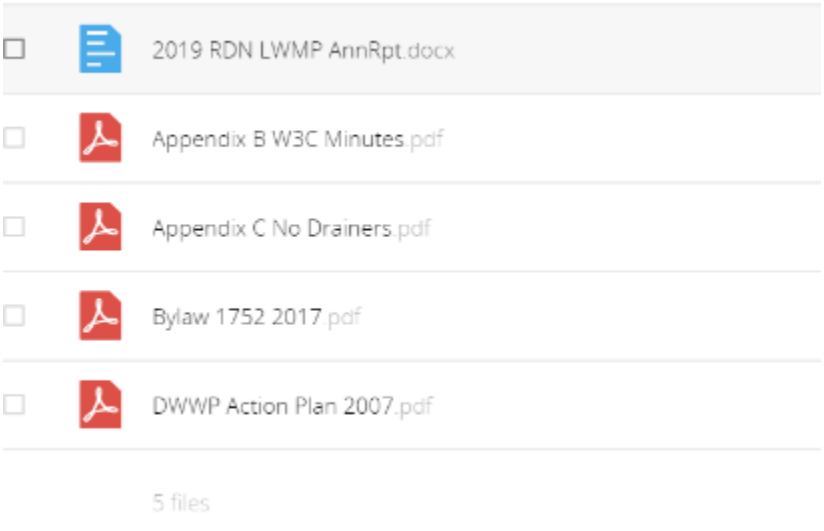
Name	Type	Compress...
2015 Annual Report	PDF File	3,697 KB
2016 Annual Report - FINAL	PDF File	6,273 KB
2018 RDN LWMP Annual Report	PDF File	1,664 KB
RDN 2017 LWMP Annual Report	PDF File	5,920 KB

Project Resources

Name	Type
guide_to_preparing_liquid_waste_mgmt_plans	PDF File
W3C Terms of Reference	PDF File

Additional Information

Name	Date modified	Type	Size
2.1.2 SepticSmart Presentation 2019	2020-02-29 12:21 PM	PDF File	
2.1.3 Gabriola Site 57	2020-02-29 12:23 PM	PDF File	2
2.1.3 OnSite Sewage rpt0101	2020-02-29 12:24 PM	Microsoft Word 97 - ...	
6.2.1 FCPCC Change Room	2020-02-20 12:19 PM	PDF File	
6.2.1 VOL 3 (Div 12-15) - Compiled 2017-03-31	2020-02-20 12:19 PM	PDF File	
6.3 January 3, 2019 Preventative Measures	2020-02-20 12:19 PM	Microsoft Word Doc...	
6.3 January 28, 2018 Corrective Action List	2020-02-20 12:19 PM	Microsoft Word Doc...	
7.1.2 Parksville Interceptor Modelling	2020-02-20 12:19 PM	PDF File	
7.1.3 FCPCC CCTV	2020-02-20 3:27 PM	Microsoft Excel Work...	
7.1.3 GNPCC CCTV	2020-02-20 3:27 PM	Microsoft Excel Work...	
10_year_action_plan_implementation_review_-_september_2018	2020-01-31 2:39 PM	PDF File	
236R RDN Maintenance Sheets January 2020	2020-02-23 1:52 PM	PDF File	
882 Drew Road summary by Planning	2020-02-18 7:57 PM	Microsoft Word Doc...	
2007 Corporate Climate Change Plan	2020-01-29 4:11 PM	PDF File	1
2013 Water Conservation Plan	2020-01-31 4:39 PM	PDF File	
2019 RDN LWMP AnnRpt	2020-02-20 12:19 PM	Microsoft Word Doc...	
Ackerman Cover Letter for Petitions Sept 2018	2020-02-18 7:57 PM	Microsoft Word Doc...	
Ackerman Sewer Service Area Amendment Letter Feb 2018	2020-02-18 7:57 PM	Microsoft Word Doc...	
Anderson FC Sewer Service Area Amendment -1341 Lundine	2020-02-18 7:57 PM	Microsoft Word Doc...	
Basedow - Marion Cover Letter for Pacific Shores Sewer Petition Jan ...	2020-02-18 7:57 PM	Microsoft Word Doc...	
Brace, 3487 Isl Hwy West Letter for Surfside sewer petition Jan 2019	2020-02-18 7:57 PM	PDF File	
Jaques2 Cover Letter for FC and NC Sewer Petitions July 23, 2014	2020-02-18 7:57 PM	PDF File	
Low Flow Toilet Brochure	2020-01-31 4:08 PM	PDF File	
LWMP Audit	2020-01-23 9:28 PM	Compressed (zipped)...	82
Mallard Place Letter Re Failure to Proceed with Sewer March 2018	2020-02-18 7:57 PM	Microsoft Word Doc...	
Mallard Place Letter to Residents on Letterhead DC	2020-02-18 7:57 PM	Microsoft Word Doc...	
RE Meeting re 882 Drew Rd. French Creek (1.76 MB)	2020-02-18 7:57 PM	Outlook Item	
RE Questions for LWMP Audit (157 KB)	2020-02-20 12:19 PM	Outlook Item	



Appendix B – LWMP Commitment Progress Details

LWMP Commitment			2020 Audit Status	Status Symbol
0 Approval Conditions	1	Within 30 days of receipt of this letter, provide terms of reference, plan and schedule for completion of Stages 1 & 2 of an Environmental Impact Study for each of the GNPCC, NBPCC and French Creek Pollution Control Centre (FCPCC) sewage treatment and disposal facilities.	Met	✓=
	2	By January 31, 2015, provide the Environmental Impact Study for the marine portion of the GNPCC outfall replacement project.	Met	✓=
1 Public Wastewater Systems	**1. Establish a strategy to achieve wastewater servicing in growth containment areas:**			
	1 (i)	A study to identify Village Centres with the development potential to warrant an investment in wastewater infrastructure	Met	✓=
	1 (ii)	Complete sewer servicing engineering studies for Bowser and Cedar villages	Met	✓=
	1 (iii)	Coordinate with Development Services through the OCP review process to identify property owners in growth containment boundaries who are interested in establishing public wastewater services	Met - Ongoing	✓→
	2. Establish a strategy to achieve wastewater servicing for properties with failing private onsite systems:			
	2 (i)	Draft a bylaw to allow properties with failing onsite systems to connect to sewer services, where available	Adjusted - Met	✓≠
	2 (ii)	Improve public awareness of areas which may connect to RDN sewer systems for health and environmental reasons (failing onsite system) and create a guide which walks homeowners through the sewer connection application process	Behind Schedule	←←
	2 (iii)	Work with property owners, as needed, in locations where there are known onsite system failures to establish connections to public wastewater infrastructure	Met - Ongoing	✓→
	2 (iv)	Develop a webpage to inform the public of historic sewer servicing studies and of the criteria for the provision of future sewer services.	Behind Schedule	←←
ms	**1. Enhance SepticSmart education program content:**			
	1 (i)	Annually review the SepticSmart education program; update where necessary	Met - Ongoing	✓→
	1 (ii)	Enhance the source control component of the SepticSmart program	Met - Ongoing	✓→
	1 (iii)	Work with VIHA and Water Services to develop area-specific communications or newsletters for areas at high risk for groundwater contamination	Met - Ongoing	✓→
	1 (iv)	Host at least four SepticSmart education workshops annually	Met	✓=

LWMP Commitment			2020 Audit Status	Status Symbol
2 Private Onsite Syster	1 (v)	Evaluate the potential for a mandatory onsite system maintenance program in the RDN	Met	✓=
	2. Work with Development Services to adopt draft changes to Land Use and Subdivision Bylaw (No. 500) which would enable the RDN to acquire privately-owned onsite systems serving at least 60 parcels, if petitioned			
		No specific actions identified, but initial committment	Behind Schedule	← ←
	3. Limit holding tanks in the RDN:			
	3 (i)	Review and revise the Pump & Haul Local Service Establishment Bylaw (No. 975) and the Sewage Disposal Regulation Bylaw (No. 1224) so only grandfathered properties and properties with failed onsite systems qualify for the septage receiving rate reduction	Adjusted - Met	✓≠
	3 (ii)	Work with VIHA and Building Inspection Services to limit holding tanks on new developments.	Adjusted - Met	✓≠
3 Source Control	**1. Enhance regional source control:**			
	1 (i)	Work with the municipalities to develop similar source control bylaws or adopt a single bylaw	Met	✓=
	1 (ii)	Amend the Trucked Liquid Waste Disposal Bylaw (No. 988) to allow marinas to apply for reduced holding tank waste disposal rates if they provide free pump-out services to discourage marine dumping	Met	✓=
	1 (iii)	Work with municipalities, marinas, and/or harbour authorities to accept wastewater from marine vessels as opportunities arise	Met - Ongoing	✓→
	2. Enhance the public education and outreach strategy:			
	2 (i)	Collaborate with other RDN departments to promote pollution prevention strategies	Met - Ongoing	✓→
	2 (ii)	Liaise with other local governments to share source control strategies	Met - Ongoing	✓→
	2 (iii)	Promote source control through the SepticSmart program	Met - Ongoing	✓→
	2 (iv)	Encourage green boating practices	Met - Ongoing	✓→
	2 (v)	Target the outreach program on RDN residents, medical clinics, the hospital, and businesses to address pharmaceuticals, personal care products, organics, fat, oil, grease, and I&I	Met - Ongoing	✓→
	2 (vi)	Partner with RDN community members with an interest in promoting source control (e.g. non-governmental organizations; local stewardship groups)	Met - Ongoing	✓→

LWMP Commitment			2020 Audit Status	Status Symbol
	2 (vii)	Consider publishing regular articles (e.g. newspaper or Regional Perspectives) promoting source control	Met - Ongoing	✓➔
	2 (viii)	Update the RDN website information on source control	Met - Ongoing	✓➔
	3. Monitor wastewater influent:			
	3 (i)	Monitor influent and biosolids quality and review discharge permits to assess potential contaminant sources	Met - Ongoing	✓➔
	3 (ii)	Work with RDN Bylaw Services to provide enforcement as needed.	Met - Ongoing	✓➔
4 Odour Control	**1. Maintain and upgrade equipment:**			
	1 (i)	Continue using current odour control measures and consider new control technologies as required	Met - Ongoing	✓➔
	1 (ii)	Address odour at Bay Ave Pump Station	Met - Ongoing	✓➔
	1 (iii)	Replace biofilter media at GNPCC and FCPCC	Met	✓=
	1 (iv)	Reverse the air flow through the trickling filter at FCPCC	Met	✓=
	1 (v)	Install ion generators at Hall Road and Chase River Pump Stations	Met	✓=
	1 (vi)	Review the odour management system at GNPCC to identify potential improvements	Met	✓=
	1 (vii)	Complete improvements to the odour management system at the NBPCC outfall manhole	Met	✓=
	1 (viii)	Incorporate odour controls into the design phase of future capital works projects including upgrade of GNPCC, NBPCC and expansion of FCPCC	Met	✓=
	1 (ix)	Seek resident input before upgrading or expanding facilities	Met	✓=
	2. Investigate, document, and respond to odour complaints within 24 hours.			
		No specific actions identified, other than initial commitment.	Met	✓=
	1. Develop a regional strategy on rainwater management			

	LWMP Commitment		2020 Audit Status	Status Symbol
5 Rainwater Management / Drinking Water & Watershed Protection	1 (i)	Collaborate with Development Services, Water Services, Energy & Sustainability Services, and member municipalities to create a Rainwater Management Plan	Behind Schedule	←←
	1 (ii)	Liaise with other local governments to share rainwater management strategies	Met - Ongoing	✓→
	1 (iii)	When developing the plan, consider subdivision development standards (i.e. low impact development principles, green infrastructure policies, erosion and control standards, onsite rainwater management, watercourse protection, and wetland protection) and non-point source control (i.e. runoff pollution)	Met - Ongoing	✓→
	1 (iv)	Support Building Code changes that remove barriers to rainwater harvesting	Met - Ongoing	✓→
	1 (v)	Subject to Board approval of the Rainwater Management Plan, Wastewater Services and Water Services will coordinate the plan, administer the budget, and oversee collaboration with other departments and jurisdictions	Behind Schedule	←←
	1 (vii)	Establish watershed performance targets and standards to mitigate the impacts of land development	Met - Ongoing	✓→
	2. Implement rainwater management initiatives under the Drinking Water & Watershed Protection Action Plan:			
	2 (i)	Develop a regional Water Budget to increase our understanding of ground and surface water resources	Met - Ongoing	✓→
	2 (ii)	Monitor water quality in selected streams to study the impact of land use on watershed health (e.g. Community Watershed Monitoring)	Met - Ongoing	✓→
	2 (iii)	Monitor the impacts of climate change on hydrology in the RDN to identify flood risks	Met - Ongoing	✓→
	2 (iv)	Continue to implement the seven programs detailed in the DWWP Action Plan including integrated watershed management planning	Met - Ongoing	✓→
	2 (v)	Implement the Water Conservation Plan	Met - Ongoing	✓→
	2 (vi)	Refine the Water Budget Study to assist in land use and development decisions	Met - Ongoing	✓→
	2 (vii)	Continue to provide water education, incentive programs and watershed monitoring partnerships.	Met - Ongoing	✓→
	1. Reduce per capita water consumption:			

LWMP Commitment			2020 Audit Status	Status Symbol
6 Volume Reduction	1 (i)	Promote water conservation incentives like low-flow toilet rebates	Met	✓=
	1 (ii)	Work with provincial regulators to provide public with information around opportunities for greywater reuse, as supported by the BC Building code and provincial regulations	Met	✓=
	1 (iii)	Educate the public through free workshops and online information	Met - Ongoing	✓➔
	1 (iv)	Hold semi-annual meetings with the City of Nanaimo, District of Lantzville, City of Parksville, and Town of Qualicum Beach to develop a regional volume reduction strategy	Met	✓=
	1 (v)	Continue to develop and implement water conservation measures through the DWWP service, with a target of reducing per capita water consumption by 25% between 2009 and 2030	Met - Ongoing	✓➔
	2. Reduce water consumption used in RDN buildings and wastewater treatment operations			
	2 (i)	Install low-flow or dual flush toilets and other water-saving devices in RDN buildings	Met - Ongoing	✓➔
	2 (ii)	Consider water efficient technology when designing infrastructure upgrades and expansion	Met - Ongoing	✓➔
	2 (iii)	Promote the use of reclaimed water when practicable	Met - Ongoing	✓➔
	3. Identify potential sources of sanitary sewer overflows and develop a strategy to eliminate			
		No specific actions identified, other than initial commitment.	Met - Ongoing	✓➔
	1. Monitor I&I entering RDN infrastructure:			
	1 (i)	Set up an I&I monitoring function for GNPCC and FCPCC in FlowWorks (flow monitoring system)	Met	✓=
	1 (ii)	Evaluate flow data to understand system reaction to rainfall and high flow events	Met - Ongoing	✓➔
	1 (iii)	Use CCTV to inspect GNPCC and FCPCC interceptors on a 5-year cycle	Met - Ongoing	✓➔
	1 (iv)	Maintain and install flow meters and rainfall gauges as needed	Met - Ongoing	✓➔
	2. Reduce I&I into RDN owned infrastructure:			

	LWMP Commitment		2020 Audit Status	Status Symbol
7 Inflow & Infiltration	2 (i)	Repair manholes as needed; perform regular maintenance of interceptors	Met - Ongoing	✓➔
	2 (ii)	Investigate grant funding opportunities (e.g. Gas Tax Fund) for infrastructure rehabilitation	Met - Ongoing	✓➔
	3. Design upgrades to RDN infrastructure so flows up to 2 times ADWF will receive secondary treatment and all flows in excess of this amount will receive primary treatment			
	3(i)	Design upgrades to RDN infrastructure so flows up to 2 times ADWF will receive secondary treatment and all flows in excess of this amount will receive primary treatment	In progress	➔➔
	4. Develop a regional strategy on I&I management:			
	4 (i)	Hold semi-annual meetings with the municipalities to develop regional monitoring and reduction targets for inflow and infiltration	Met	✓=
	4 (ii)	Share flow and rainfall data with municipalities	Met - Ongoing	✓➔
	4 (iii)	Consider requiring replacement or disconnection of private laterals when granting demolition permits	Met	✓=
	4 (iv)	Consider providing municipal or regional staff to witness or perform service connections	Met	✓=
	4 (v)	Work with the member municipalities to continue to reduce flows due to I&I and to eliminate sewer overflows	Met - Ongoing	✓➔
	5. Help landowners manage private property I&I:			
	5 (i)	Enhance the source control program to encourage landowners to check gutters and outside drains for connection to the sewer system, avoid planting trees and shrubs over sewer laterals, ensure basement drains and sump pumps are not connected to the sanitary sewer, and replace broken or leaky pipes located on private property	In progress	➔➔
	5 (ii)	Consider providing incentives to enable residents to reduce private property I&I.	In progress	➔➔
	1. Comply with permit or operational certificate:			
	1 (i)	Manage wastewater collection and treatment using the RDN's EMS to meet permit requirements	Met - Ongoing	✓➔
	1 (ii)	Work with MOE staff to establish reasonable timelines and scope of any required receiving environment monitoring programs	Met	✓=
	2. Maintain existing infrastructure:			
	2 (i)	Update and evaluate asset management and preventative maintenance plans	Met	✓=

LWMP Commitment			2020 Audit Status	Status Symbol
8 Pollution Control Centres	2 (ii)	Systematically inspect, detect, and correct incipient failures	Met - Ongoing	✓→
	2 (iii)	Replace the GNPCC effluent outfall line by 2015	Met	✓=
	2 (iv)	Prepare an Environmental Impact Study for the GNPCC outfall	Met	✓=
	2 (v)	Monitor the condition of the Departure Bay forcemain	Met	✓=
	2 (vi)	Improve the odour management system at the NBPCC outfall manhole	Met	✓=
	3. Expand and provide secondary treatment at GNPCC:			
	3 (i)	Commission a third digester (complete 2013)	Met	✓=
	3 (ii)	Construct a fourth primary sedimentation tank (complete 2013)	Met	✓=
	3 (iii)	Upgrade the facility to provide secondary treatment by 2018	Behind Schedule	←←
	3 (vii)	Explore federal and provincial grant options to fund secondary treatment	Met	✓=
	4. Provide secondary treatment at NBPCC:			
	4 (i)	Upgrade the facility to provide secondary treatment by 2023	In progress	→→
	4 (ii)	Explore federal and provincial grant options to fund secondary treatment	Met	✓=
	5. Expand capacity at FCPCC:			
	5 (i)	Expand the treatment plant capacity	In progress	→→
	6. Work with Development Services to complete a sewer servicing strategy for Nanoose Bay:			
	6 (i)	Coordinate with Development Services through the OCP review process to identify property owners in growth containment boundaries who are interested in establishing public wastewater services	Behind Schedule	←←
	6 (ii)	Consider resource recovery, visual, and olfactory buffers and the number of pump stations required	Behind Schedule	←←
	6 (iii)	Review and update the Fairwinds sewer servicing agreement and DCC bylaw for the Nanoose Bay area	Behind Schedule	←←

LWMP Commitment			2020 Audit Status	Status Symbol
	7. Develop a DCC Bylaw to allow new construction to use existing capacity at DPPCC:			
	7 (i)	Develop a DCC bylaw to allow properties in the growth containment area to purchase capacity at DPPCC	Behind Schedule	←←
	8. Review DCC plan every year and revise bylaws when necessary to adequately fund growth-related projects			
	8 (i)	Revise DCC bylaws at GNPCC, NBPCC, and FCPCC.	Met	✓=
9 Resource Recovery	**1. Reduce resource consumption at wastewater treatment facilities:**			
	1 (i)	Complete a study to review resource recovery opportunities at RDN wastewater facilities	Met - Ongoing	✓→
	1 (ii)	Evaluate wastewater treatment operations which require energy, water, chemicals or fuel and identify activities that can be run more efficiently, if any	Met - Ongoing	✓→
	2. Recover resources from wastewater:			
	2 (i)	Commission a cogeneration facility for biogas recovery and energy generation at GNPCC	Met	✓=
	2 (ii)	Continue to beneficially use biosolids according to the Biosolids Program	Met - Ongoing	✓→
	2 (iii)	Reclaim water for use onsite in compliance with MOE guidelines (MOELP 2001)	Met - Ongoing	✓→
	2 (iv)	Discuss future opportunities for reclaimed water use with Morningstar Golf Course	Met	✓=
	2 (v)	Consider potential resource recovery options for new projects, particularly through process selection	Met - Ongoing	✓→
	2 (vi)	Examine opportunities for a district heating project at Hammond Bay Elementary using the GNPCC outfall	Met - Ongoing	✓→
	2 (vii)	Examine opportunities for using reclaimed water for the Fairwinds Golf Course.	Behind Schedule	←←
	1. Produce, at minimum, Class B biosolids:			
	1 (i)	Develop a Biosolids Management Plan to assess options for the beneficial use of RDN biosolids, including land application, energy generation, and other possible resource recovery strategies	Met	✓=
	1 (ii)	Improve the quality of biosolids through upgrades to wastewater treatment infrastructure and innovative technologies and techniques (i.e. decrease volatile solids content and pathogen concentrations)	In progress	→→

LWMP Commitment			2020 Audit Status	Status Symbol
10 Biosolids	1 (iii)	Monitor and report biosolids quality according to operational certificate/discharge permit and OMRR	Met - Ongoing	✓➔
	1 (iv)	Establish a contingency plan for temporary storage or application of biosolids if the VIU site is not useable	Met	✓=
	2. Expand biosolids-based education and outreach activities targeted at RDN residents:			
	2 (i)	Develop and distribute information on source control in order to improve biosolids quality	Met - Ongoing	✓➔
	2 (i)	Develop material to increase awareness of precautions taken to ensure the storage and application of biosolids do not negatively impact groundwater	Met	✓=
	2 (iii)	Continue working with local user groups to communicate plans for biosolids application areas	Met - Ongoing	✓➔
	2 (iv)	Provide educational material and outreach at open houses and other events.	Met - Ongoing	✓➔
EMERGING ISSUES				
11 Emerging Issues	1	Shellfish Harvesting Areas	Met - Ongoing	✓➔
	2	Contaminants of Emerging Concern	Met - Ongoing	✓➔
	3	Heritage Resources	Met - Ongoing	✓➔
	4	Climate Change	Met - Ongoing	✓➔
	5	Non-Point Sources of Pollution	Met - Ongoing	✓➔

Appendix B – W3C Meeting Minutes

W3C: WASTEWATER & WATER COLLABORATIVE MEETING

Friday, March 15, 2019; 9:00 am – 12:30 pm
6300 Hammond Bay Road – RDN Committee Room

MINUTES

ATTENDEES:

Adrian Limpus – RDN
Bob Weir – Qualicum Beach
Chris Kerman – RDN
Dean Mousseau – Nanaimo
Duncan Taylor – RDN
Fred Spears – Lantzville
Gerald St. Pierre – RDN
James Haddou – RDN
John Elliot – Nanaimo
Julie Pisani – RDN
Murray Walters – RDN
Randy Alexander – RDN
Rob Skwarczynski – RDN
Sean De Pol – RDN
Ryan Powell – RDN
Shelley Norum – RDN

1. ROUNDTABLE UPDATE

RDN Wastewater Services:

- J. Haddou provided an update on the GNPCC Secondary Treatment Project.
- S. De Pol provided an update on the Bowser Village Centre Wastewater Project.
- D. Taylor provided an update on the following capital projects:
  - Chase River Forcemain & Pump Station Upgrades
  - FCPCC Upgrade & Expansion
  - Bay Avenue Pump Station.
- S. Norum provided an update on the Liquid Waste Management Plan, SepticSmart, and the Biosolids program.

RDN Water Services and Drinking Water and Watershed Protection Program (DWWP):

- J. Pisani gave an update on the Drinking Water & Watershed Protection Action Plan Update.
- M. Walters provided an update on the Englishman River Water Service and the Whiskey Creek water source.

District of Lantzville:

- F. Spears provided an update on the Sanitary Sewer Phase 3 and the Foothills project.

Town of Qualicum Beach:

- B. Weir provided an update on the Beach Creek Estuary project.

City of Nanaimo:

- D. Mousseau provided an update on City of Nanaimo's activities:
  - Manual of Engineering Standards and Specifications
  - Rainwater retention.
- J. Elliot provided an update on activities in Nanaimo:
  - Just selected Urban Systems with GeoAdvice to complete the Departure Bay San Sewer Catchment Master Plan which is scheduled to be completed late summer [update from after meeting].
  - Detailed design of the Millstone Trunk will be completed in four sections. Currently working on Geotechnical assessment.
    1. Within Bowen Park – scheduled for construction in 2020
    2. On Comox Rd from 821 Comox to Milton St – scheduled for construction in 2020
    3. At Pearson Bridge – scheduled for construction in 2020
    4. Nanaimo Parkway to Pride – scheduled for construction in 2021
  - KWL completed a template for reporting on rain events from CoN rain gauge stations which will be shared with the group once approved.
  - Please email Doris if there are any questions on I&I material shared.
  - Infrastructure Planning group will install three new permanent monitoring stations this year.
  - Construction has started on 7th Street Pump Station and should be complete by end of year.

2. FLOW MONITORING

A. Limpus provided a flow monitoring billing update for the Northern and Southern Communities.

7. SOURCE CONTROL

- S. Norum introduced the Source Control Community of Practice that the RDN participates in.
- J. Elliot provided an update on the colour-coded response map in his roundtable update.
- The group discussed a referrals process for projects affecting RDN Wastewater Services.

8. UPCOMING EVENTS & DATES

March 27, 2019 4 PM – 6 PM	French Creek Pollution Control Centre Expansion and Odour Upgrade Public Information Session Oceanside Place - Multipurpose Room (Upstairs) 830 Island Highway West, Parksville
May 1, 2019 1 PM – 3 PM	SepticSmart Workshop Bradley Centre, Coombs 975 Shearme Road
May 2, 2019 6 PM – 8 PM	SepticSmart Workshop Cedar Community Hall 2388 Cedar Road
May 8, 2019 7 PM – 9 PM	SepticSmart Workshop Mountainview School, Nanaimo 2480 East Wellington Road

May 13, 2019 6 PM – 8 PM	SepticSmart Workshop Parksville Community & Conference Centre 132 E. Jensen Avenue
May 22, 2019	City of Nanaimo Public Works Day Public Works Yard 2020 Labieux Road, Nanaimo

9. CLOSE AND PROPOSE NEXT MEETING

The next W3C meeting is scheduled for September 2019. If the timing works well with the construction schedule, the meeting may start with a tour of the GNPCC Secondary Treatment Upgrade Project. Since parking will be limited, we may hire a bus to transport us from the Admin building to GNPCC.

W3C: WASTEWATER & WATER COLLABORATIVE MEETING

Friday, September 6, 2019; 9:00 am – 1:00 pm
Parksville Community Centre – Red Cedars / Maples Room

MINUTES

ATTENDEES:

Adrian Limpus – RDN
Bob Weir – Qualicum Beach
Duncan Taylor – RDN
Fred Spears – Lantzville
Gerald St. Pierre – RDN
Hanna Ross – RDN
Ian Lundman – RDN
James Haddou – RDN
John Elliot – Nanaimo
Lorena Mueller – RDN
Mike Squire – Nanaimo
Randy Alexander – RDN
Sean De Pol – RDN
Shelley Norum – RDN
Vaughn Figueira – Parksville

1. PRESENTATIONS

- SYLVIS Environmental gave a presentation on the RDN Biosolids Management Program
  - See attached article (Lawson *et al.*, 2016) on the influence of biosolids on grassland habitat

2. ROUNDTABLE UPDATE

RDN Wastewater Services:

- J. Haddou provided an update on the GNPCC Secondary Treatment Project.
- D. Taylor provided an update on the following capital projects:
  - Chase River Forcemain & Haliburton Street Upgrades
  - FCPCC Upgrade & Expansion
  - Bay Avenue Pump Station.

RDN Water Services and Drinking Water and Watershed Protection Program (DWWP):

- G. St. Pierre gave an update on Water Services and the Drinking Water and Watershed Protection Program.
  - Nanoose Bay Peninsula Pumpstation – Commissioned September 10 to 12
  - Drinking Water and Watershed Protection Action Plan 10 year update
  - Community Watershed Monitoring Network
  - Rebates for rainwater harvesting, irrigation efficiency and soil improvements
  - Water quality and quantity risk assessment to support the Area F (Coombs, Errington, Hilliers) Official Community Plan update taking place in 2019-2020
  - Team WaterSmart workshops this fall on wetlands and well maintenance
  - For questions on DWWP projects – contact Julie Pisani jpisani@rdn.bc.ca.

City of Parksville

- V. Figueira gave an update on the Englishman River Water Treatment Plant.

District of Lantzville:

- F. Spears provided an update on the Sanitary Sewer Phase 3 project.

Town of Qualicum Beach:

- B. Weir provided an update on the Marine Spit Construction Project and the Eaglewood cross-connection investigation.

City of Nanaimo:

- M. Squire provided an update on:
  - Reservoir levels and water conservation
  - Bulk water supply meter commissioning
  - Emergency water supply pump station
  - Water Supply Strategic Plan Update
  - Colliery Dam
- J. Elliot provided an update on:
  - Summer programs – a number of programs complete; line painting and wastewater programs continuing
  - Vegetation control has been challenging due to weather
  - Homelessness impact on operations
  - Garbage costs for illegal dumping
  - Sourcewell Purchasing Forum – contact John if you are interested in more information
  - Job Shadowing agreement with SFN
- D. Fournier provided an update on:
  - Engineering Standards – Edition #12 to be in effect November 2019 and Edition #13 planned for May 2020

3. INFLOW & INFILTRATION

- J. Elliot and D. Fournier provided updates on I&I activities. Doris reviewed the City's I&I Reduction Strategy, attached, and offered to lend the strategy as a template to other municipalities. Also reviewed actions taken by the City of Nanaimo Engineering group in 2019

4. SOURCE CONTROL

- J. Elliot provided an update on the colour-coded response map. Once they are done (October) operators should run a mock scenario drill.
- H. Ross provided an update on RDN Social Media activities which emphasize source control.

5. FLOW MONITORING

A. Limpus provided a flow monitoring billing update for the Northern and Southern Communities.

6. CLOSE AND PROPOSE NEXT MEETING

The next W3C meeting is scheduled for March 2020. If the timing works well with the construction schedule, the meeting may start with a tour of the GNPCC Secondary Treatment Upgrade Project.

7. ATTACHMENTS

- Lawson, K.J., K.E. Hodges, F. Doyle and J. Lavery. 2016. How Does Wildlife Respond to Grassland Landscapes Restored with Biosolids. Grasslands Conservation Council of BC. p. 25.
- City of Nanaimo Inflow & Infiltration Reduction Strategy 2018.

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