

Appendix C:

Wastewater Glossary and LWMP Factsheets



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Wastewater Mini Glossary

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WASTEWATER MINI GLOSSARY

WASTEWATER SERVICES GLOSSARY

As you read the Wastewater Services and Liquid Waste Management Plan Factsheets, you may come across some technical terms. Some of these terms are explained below.

Benchmarking: An ongoing process of sharing ideas and comparing products, services and practices with those of similar organizations to improve quality and optimize performance. Through benchmarking, the RDN can improve performance and reduce costs.

Biogas: Biogas refers to the methane and carbon dioxide produced as a by-product of anaerobic digestion. Biogas is a sustainable fuel source used as fuel for heat or to create electricity.

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

Carbonaceous 5-day biochemical oxygen demand (BOD₅): is the rate at which aerobic biological organisms use the oxygen in water or wastewater over a five day incubation period.

Chemically-enhanced primary treatment: Chemically-enhanced primary treatment is the same as primary treatment, except a polymer is added to make the settling process more efficient. Primary wastewater treatment essentially uses gravity to treat the wastewater in large settling tanks. The tanks allow the lighter fats, oils, and grease to rise to the surface while the heavier materials settle to the bottom to form sludge. Fats, oil, and grease are skimmed off and sent to the landfill. The sludge is treated further, to become biosolids. Primary treatment produces an effluent quality with a carbonaceous 5-day biochemical oxygen demand (BOD₅) not exceeding 130 mg/L and total suspended solids (TSS) concentration not exceeding 130 mg/L.

Cogeneration: A form of resource recovery which refers to the use of biogas (methane and carbon dioxide by-products) to generate both electricity and heat.

Development cost charge: Funds collected to offset that portion of the costs related to services that are incurred as a direct result of this new development. DCCs are applied as one-time charges and are usually collected from developers at the time of subdivision approval or at the time of issuing a building permit.

Digester: Wastewater treatment infrastructure which stabilizes sludge in the process to produce biosolids.

Effluent: Liquid resulting from the treatment of wastewater

Environmental Management System: An Environmental Management System is a tool used to evaluate and improve environmental performance. The RDN Wastewater Service's EMS is ISO 14001 certified. >



LIQUID WASTE MANAGEMENT PLAN



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Forcemain: Large sewer lines that control the flow of wastewater to the treatment plant. This type of pipe is similar to an interceptor, except that it is typically located in low-lying areas and wastewater must pass through a pumping station, rather than be transported by gravity.

Inflow and infiltration: Inflow and infiltration is relatively clean water that enters the sanitary sewer system, mainly as a result of a rainfall event or snow melt. Inflow enters the system from the top – for example roof leaders that drain into the sewer system. Infiltration enters the system from below the ground, for example through leaky pipes or house sump pumps.

Interceptors: Large sewer lines that control the flow of wastewater to the treatment plant. These pipes generally follow the natural slope of land allowing gravity to transport wastewater. This type of pipe is similar to a forcemain, except that it is typically gravity-fed, not pressurized by pump stations.

Ministry of Environment: The approving authority for the Liquid Waste Management Plan.

Municipal Wastewater Regulation: Provides guidance on meeting the current standards and requirements for the treatment, reuse and disposal of sewage. It applies to all discharges of domestic wastewater except those regulated under the Public Health Act Sewerage System Regulation and discharges from single or multi-family dwellings. Also applies to any discharges of sewage to water bodies.

Official Community Plans: A statement of objectives and policies to guide decisions on planning and land use management, within the area covered by the plan, respecting the purposes of local government.

Outfall: The pipe which transports treated wastewater effluent to its discharge location (in the RDN, the discharge locations are in the Strait of Georgia).

Private laterals: privately owned pipelines which deliver wastewater from private property to the municipal collection system (owned by a municipality or the RDN).

Reclaimed water: Municipal wastewater that is treated and suitable for use in accordance with the Municipal Wastewater Regulation.

Resource recovery: the recovery of value from waste resources (e.g. energy generation, water reuse, and nutrient recovery).

Secondary treatment: Wastewater treatment (usually biological or physical-chemical) to remove organics which consistently produces an effluent quality with a carbonaceous 5-day biochemical oxygen demand (BOD₅) and total suspended solids (TSS) concentrations not more than 45 mg/L, as defined by the Municipal Wastewater Regulation.

Sludge: the materials that settle in a primary settling tank (primary sludge) and secondary clarifier (secondary sludge). Sludge in the RDN is treated further to become biosolids.

Trickling Filter: secondary treatment technology at French Creek Pollution Control Centre

Wastewater Systems Effluent Regulations: Regulations under the federal Fisheries Act designed to harmonize wastewater management in Canada. They include minimum effluent quality standards that can be achieved through secondary wastewater treatment

Wastewater: “used” water and the wastes that it carries. Basically, they are terms for what is flushed down the toilet or washed down the drain. Wastewater can also include rain water, groundwater, or snow melt (inflow and infiltration) that make their way into sanitary wastewater pipes.

Watershed: an area of land that catches rain and snow and where water flows downward into a specific river, stream, lake, or aquifer.

Vancouver Island Health Authority (VIHA): The provincial government agency that provides health care services to people on Vancouver Island, the islands of the Georgia Strait, and the mainland communities between Powell River and Rivers Inlet.



For more information, visit the RDN Wastewater Services website at www.rdn.bc.ca or contact Wastewater Services at (250) 390-6560, (250) 954-3792, or 1-877-607-4111. Alternately, you may email rcu@rdn.bc.ca.



Factsheet 1: Wastewater Services Overview

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Wastewater Services Overview

WASTEWATER SERVICES FACTSHEET

1

WASTEWATER SERVICES

Wastewater management is a key service provided by the Wastewater Services department of the Regional District of Nanaimo (RDN). The RDN treats wastewater from approximately 113,500 people between Qualicum Beach and Duke Point. To provide this service, RDN Wastewater Services owns and operates four wastewater treatment facilities. Two treatment facilities provide secondary treatment and two provide chemically-enhanced primary treatment.

RDN wastewater is managed according to the **Liquid Waste Management Plan (LWMP)**, Operational Certificates, and Waste Discharge Permits. RDN Wastewater Services uses an Environmental Management System and participates in benchmarking to continually improve service and environmental performance. RDN Wastewater Services also has comprehensive, long term programs to manage wastewater, produce biosolids, use waste as a resource, and prevent pollution in the region. >

WHY DOES THE RDN HAVE A LIQUID WASTE MANAGEMENT PLAN (LWMP)?

Laws governing wastewater management in British Columbia require us to protect public health and, over time, achieve a standard level of wastewater treatment. They also encourage us to recover resources from waste. Our LWMP authorizes the RDN to find community-driven and cost-effective solutions to achieve these goals.

A public LWMP amendment process is now underway.

The result will guide our wastewater strategy into the future, which includes upgrading treatment levels.



LIQUID WASTE
MANAGEMENT PLAN



Wastewater
SERVICES



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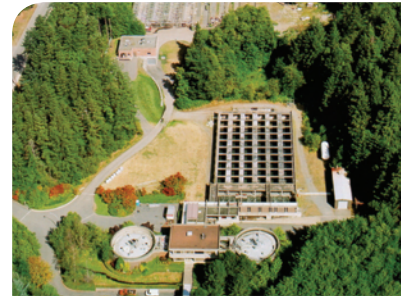


REGIONAL
DISTRICT
OF NANAIMO

FAST FACTS Pollution Control Centres

Greater Nanaimo Pollution Control Centre

Plant location: 4600 Hammond Bay Road, Nanaimo
Outfall Terminus: 49° 14' 14.0985"N; 123°56' 17.7600"W
Estimated population served: 86,068
Current treatment: chemically-enhanced primary treatment



French Creek Pollution Control Centre

Plant location: 957 Lee Road, Parksville
Outfall Terminus: 49°22'8.2566"N; 124°20' 47.8771"W
Estimated population served: 26,047
Current treatment: secondary treatment



Nanoose Bay Pollution control centre

Plant location: 3260 Schooner Cover Drive, Nanoose Bay
Outfall Terminus: 49° 17'27.2202"N; 123°7'40.1987"W
Estimated population served: 1,350
Current treatment: chemically-enhanced primary treatment



Duke Point Pollution Control Centre

Plant location: 625 Jackson Road, Nanaimo
Outfall Terminus: 49°8'41.3917"N; 123°52' 10.2921"W
Number of Connections: 30
Current treatment: secondary treatment with UV disinfection



For more information, visit the RDN Wastewater Services website at www.rdn.bc.ca or contact Wastewater Services at (250) 390-6560, (250) 954-3792, or 1-877-607-4111. Alternately, you may email us at rcu@rdn.bc.ca.

Last updated August 2013



Factsheet 2: LWMP Overview

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LIQUID WASTE MANAGEMENT PLAN

The Regional District of Nanaimo (RDN) has a Liquid Waste Management Plan (LWMP). The LWMP is a 20-year plan to support sustainable wastewater management in the RDN.

This plan authorizes the RDN to find community-driven and cost-effective solutions to protect public health and achieve a standard level of wastewater treatment over a reasonable timeframe.

LWMP AMENDMENT

A public LWMP Amendment process is now underway. An amendment is necessary because:

- The Ministry of Environment requires a LWMP review every five to ten years to determine if an amendment or update is required.
- Most of the key regulations and guidelines governing wastewater management in BC were revised or developed after the original LWMP was approved.
- The RDN met most of the original LWMP program commitments in the last ten years.
- The RDN is requesting an amendment to the timeline for secondary treatment upgrades at Greater Nanaimo Pollution Control Centre (GNPCC) and Nanoose Bay Pollution Control Centre (NBPCC).

PROVINCIAL AND FEDERAL LAWS REQUIRE SECONDARY WASTEWATER TREATMENT OR BETTER

Municipal wastewater treatment is governed by the provincial Municipal Wastewater Regulation and federal Wastewater Systems Effluent Regulations. These regulations include mandatory minimum effluent quality standards that can be achieved through secondary wastewater treatment or better. They also include requirements for monitoring, record-keeping, reporting and toxicity testing.

WHY IS THE PUBLIC BEING CONSULTED ON THE LWMP AMENDMENT?

The consultation process is important because an approved LWMP lets a local government borrow money without going to referendum and there is no mechanism to publicly appeal an approved LWMP. Because public consultation and First Nations engagement are key components of the LWMP process, an LWMP lets a community be involved with the decision-making process and develop local wastewater management solutions. >



LIQUID WASTE
MANAGEMENT PLAN



Ten programs make up the core of the amended LWMP and provide the tools to implement the plan.

Public Wastewater Systems Program

This program supports the provision of sewer services in RDN growth containment areas, as identified in Official Community Plans (OCPs). It also supports the provision of sewer service to properties adjacent to growth containment areas with failing private onsite systems. Through the Public Wastewater Systems Program, the RDN proposes to:

1. Establish a strategy to achieve wastewater servicing in growth containment areas:

- i. Complete a study identifying Village Centres with the development potential to warrant an investment in wastewater infrastructure (completed)
- ii. 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.

2. Establish a strategy to achieve wastewater servicing for properties with failing private onsite systems:

- i. Draft a bylaw to allow properties with failing onsite systems to connect to sewer services, where available
- ii. Work with property owners, as needed, in locations where there are known onsite system failures, to establish connections to public wastewater infrastructure
- iii. Continue to look into servicing options for Madrona/ Wall Beach, Beachcomber, Delanice Way, Dolphin Drive, Garry Oaks, and Red Gap.

Private Onsite Systems Program

This program aims to protect the public and environment from failing onsite systems. SepticSmart is offered through this program. Through the Private Onsite Systems Program, the RDN proposes to:

1. Enhance SepticSmart education program content:

- i. Annually review the SepticSmart education program; update where necessary
- ii. Enhance the source control component of the SepticSmart program
- iii. Work with VIHA and Water Services to develop area-specific communications or newsletters for areas at high risk for groundwater contamination
- iv. Host at least four SepticSmart education workshops annually
- v. Evaluate the potential for a mandatory onsite system maintenance program in the RDN (complete).

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.

3. Limit holding tanks in the RDN:

- 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
- ii. Work with VIHA and Building Inspection Services to limit holding tanks on new developments.



Odour Control Program

This program aims to reduce nuisance odours from RDN wastewater infrastructure. Through the Odour Control Program, the RDN proposes to:

1. Maintain and upgrade equipment:

- i. Continue using current odour control measures and consider new control technologies as required
- ii. Address odour at Bay Ave Pump Station (completed)
- iii. Replace biofilter media at GNPCC and French Creek Pollution Control Centre (FCPCC) (completed)
- iv. Reverse the air flow through the trickling filter at FCPCC (completed)
- v. Install ion generators at Hall Road and Chase River Pump Stations (completed)
- vi. Review the odour management system at GNPCC to identify potential improvements (completed)
- vii. Complete improvements to the odour management system at the NBPCC outfall manhole
- viii. Incorporate odour controls into the design phase of future capital works projects
- ix. Seek resident input before upgrading or expanding facilities

2. Investigate, document, and respond to odour complaints within 24 hours.

Rainwater Management / Drinking Water & Watershed Protection (DWWP) Program

This program aims to improve practices affecting rainwater, drinking water, and stormwater. Through the Rainwater Management / Drinking Water & Watershed Protection (DWWP) Program, the RDN proposes to:

1. Develop a regional strategy on rainwater management

- i. Collaborate with Development Services, Water Services, Energy & Sustainability Services, and member municipalities to create a Rainwater Management Plan
- 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
- v. Subject to Board approval of the Rainwater Management Plan, Wastewater Services will coordinate the plan, administer the budget, and oversee collaboration with other departments and jurisdictions.



Volume Reduction Program

This program aims to reduce potable water consumption in the RDN. Through the Volume Reduction Program, the RDN proposes to:

1. Reduce per capita water consumption:

- i. Promote water conservation incentives like low-flow toilet rebates (as funding permits)
- ii. Educate the public through free workshops and online information
- iii. Hold semi-annual meetings with the City of Nanaimo, District of Lantzville, City of , and Town of Qualicum Beach to develop a regional volume reduction strategy

2. Reduce water consumption used in RDN buildings and wastewater treatment operations

- i. Install low-flow or dual flush toilets and other water-saving devices in RDN buildings
- ii. Consider water efficient technology when designing infrastructure upgrades and expansion
- iii. Promote the use of reclaimed water when practicable.

Inflow and Infiltration Program

Inflow and infiltration (I&I) is relatively clean water that enters the sanitary sewer system, mainly as a result of a rainfall event or snow melt. Inflow enters the system from the top (e.g., roof leaders that drain into the sewer system). Infiltration enters the system from below the ground, (e.g., through leaky pipes or house sump pumps). The Inflow and Infiltration Program aims to reduce I&I entering the wastewater collection and treatment system in accordance with provincial standards. Through the Inflow and Infiltration Program, the RDN proposes to:

1. Monitor I&I entering RDN infrastructure:

- i. Set up an I&I monitoring function for GNPCC and FCPCC

- ii. Evaluate flow data to understand system reaction to rainfall and high flow events
- iii. Use closed-circuit TV to inspect GNPCC and FCPCC interceptors on a 5-year cycle
- iv. Maintain and install flow meters and rainfall gauges as needed

2. Reduce I&I into RDN owned infrastructure:

- i. Repair manholes as needed; perform regular maintenance of interceptors
- ii. Investigate grant funding opportunities (e.g. Gas Tax Fund) for infrastructure rehabilitation

3. Design upgrades to RDN infrastructure so flows up to 2 times Average Dry Weather Flow will receive secondary treatment and all flows in excess of this amount will receive primary treatment

4. Develop a regional strategy on I&I management:

- i. Hold semi-annual meetings with the municipalities to develop regional monitoring and reduction targets for inflow and infiltration
- ii. Share flow and rainfall data with municipalities
- iii. Consider requiring replacement or disconnection of private laterals when granting demolition permits
- iv. Consider providing municipal or regional staff to witness or perform service connections
- v. Work with the municipalities to monitor the extent of I&I in the collection system

5. Enhance the Source Control Program to encourage landowners to:

- i. Check gutters and outside drains for connection to the sewer system. Residents may contact their municipalities to find out how this is done
- ii. Avoid planting trees and shrubs over sewer laterals
- iii. Ensure basement drains and sump pumps are not connected to the sanitary sewer
- iv. Replace broken or leaky pipes located on private property.



Pollution Control Centres Program

This program aims to manage capital upgrade and expansion projects associated with the four RDN-operated pollution control centres. Through the Pollution Control Centres Program, the RDN proposes to:

1. Comply with permit or operational certificate:

- i. Manage wastewater collection and treatment using the RDN's EMS to meet permit requirements
- ii. Work with Ministry of Environment staff to establish reasonable timelines and scope of any required environmental monitoring programs

2. Maintain existing infrastructure:

- i. Update and evaluate asset management and preventative maintenance plans
- ii. Systematically inspect, detect, and correct incipient failures
- iii. Replace the GNPCC effluent outfall line in 2015
- iv. Monitor the condition of the Departure Bay forcemain
- v. Improve the odour management system at the NBPCC outfall manhole

3. Expand and provide secondary treatment at GNPCC:

- i. Commission a third digester (complete)
- ii. Construct a fourth primary sedimentation tank (underway)
- iii. Upgrade the facility to provide secondary treatment by a target date of 2016, 2018, or 2019. Three timelines are presented for discussion.
- iv. Explore federal and provincial grant options to fund secondary treatment

4. Provide secondary treatment at NBPCC:

- i. Upgrade the facility to provide secondary treatment by 2020, 2025 or 2030. Three timelines are presented for discussion.
- ii. Explore federal and provincial grant options to fund secondary treatment

5. Expand capacity at FCPC:

- i. Expand the treatment plant capacity

6. Work with Development Services to complete a sewer servicing strategy for Nanoose Bay:

- 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
- ii. Consider resource recovery, visual, and olfactory buffers and the number of pump stations required
- iii. Review and update the Fairwinds sewer servicing agreement and Development Cost Charge (DCC) bylaw for the Nanoose Bay area

7. DCC Bylaws:

- i. Develop a DCC bylaw to allow properties in the growth containment area to purchase capacity at Duke Point Pollution Control Centre (DPPCC)

8. Review DCC plan every year and revise bylaws when necessary to adequately fund growth-related projects

- i. Revise DCC bylaws at GNPCC, NBPCC, and FCPC.



Resource Recovery Program

This program aims to maximize the value recovered from wastewater resources. Through the Resource Recovery Program, the RDN proposes to:

1. Reduce resource consumption at wastewater treatment facilities:

- i. Evaluate wastewater treatment operations which require energy, water, chemicals or fuel and identify activities that can be run more efficiently, if any

2. Recover resources from wastewater:

- i. Commission a cogeneration facility for biogas recovery and energy generation at GNPCC (complete)
- ii. Continue to beneficially use biosolids according to the Biosolids Program
- iii. Reclaim water for use onsite in compliance with Ministry of Environment guidelines
- iv. Discuss future opportunities for reclaimed water use with Morningstar Golf Course
- v. Consider potential resource recovery options for new projects, particularly through process selection
- vi. Examine opportunities for using reclaimed water for the Fairwinds Golf Course.

Biosolids Program

This program aims to manage the beneficial use of biosolids. Through the Biosolids Program, the RDN proposes to:

1. Produce, at minimum, 'Class B' biosolids:

- 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 (completed)
- 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)
- iii. Monitor and report biosolids quality according to operational certificate/discharge permit and the Organic Matter Recycling Regulation
- iv. Establish a contingency plan for temporary storage or application of biosolids if the VIU site is not useable

2. Expand biosolids-based education and outreach activities targeted at RDN residents:

- i. Develop and distribute communication information on source control in order to improve biosolids quality
- ii. Provide educational material and outreach at open houses and other events.



**I DON'T HAVE SEWER SERVICE...
HOW DOES THE LWMP AMENDMENT
AFFECT ME?**

Four LWMP programs directly address issues for residents without sewer service:

- Public Wastewater Systems Program
- Private Onsite Systems Program, through which we offer SepticSmart
- Source Control Program
- Rainwater Management / Drinking Water & Watershed Protection Program

The LWMP Amendment does not propose to make any changes to the funds collected for programs which affect unsewered properties.

For more information, refer to Factsheet 3: Wastewater Basics for Unsewered Areas.

**I HAVE SEWER SERVICE...
HOW DOES THE LWMP AMENDMENT
AFFECT ME?**

If you have sewer service in the RDN, this amendment will affect your sewer user rates. It will also affect the timeline to upgrade Greater Nanaimo Pollution Control Centre and Nanoose Bay Pollution Control Centre to provide secondary wastewater treatment.

For more information, refer to Factsheet 4: Wastewater Basics for Sewered Areas. Factsheets 5, 6, and 7 may apply to you also.



**WHO WILL PAY FOR THE COSTS OF CAPITAL
PROJECTS AND UPGRADING TREATMENT TO
SECONDARY?**

The RDN funds services, based on a user pay principle, by establishing service area bylaws. The capital and operating costs associated with a service cannot be charged to RDN ratepayers living outside of the established service area. For that reason, the cost of upgrading and operating the capital projects, such as secondary upgrades, must be born entirely by the residents living within the service area.



**LIQUID WASTE
MANAGEMENT PLAN**

**HOW DO I GET INVOLVED IN THE LWMP
AMENDMENT PROCESS?**

If you have any questions or comments, you may contact the RDN Wastewater Services at (250) 390-6560, (250) 954-3792, or 1-877-607-4111. Alternately, you may email us at rcu@rdn.bc.ca.

As well, the RDN will hold special public meetings to provide the opportunity to review, ask questions about, and provide feedback on the proposed Amendment.

For more information, visit the RDN's Liquid Waste Management Plan website at www.rdnlwmp.ca.



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Factsheet 3: Wastewater Basics for Unsewered Areas

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Wastewater Basics for Unsewered Areas

WASTEWATER TREATMENT

In the Regional District of Nanaimo (RDN), most rural properties, as well as some neighbourhoods within the municipalities, are unsewered. Wastewater from unsewered properties is typically treated with privately owned Type 1, 2, or 3 onsite systems (i.e. septic systems, private packaged treatment plants, and advanced package treatment plants). There are an estimated 12,000 properties in the RDN with onsite sewage treatment, representing roughly one fifth of the RDN population. A small number of rural properties are authorized by the Vancouver Island Health Authority (VIHA) to install a holding tank and use pump and haul services.

The management, in accordance with the maintenance plan, and eventual replacement of onsite systems and holding tanks is the responsibility of the property owner.

WHAT DOES THE LWMP AMENDMENT MEAN FOR YOU?

The Liquid Waste Management Plan has a number of programs which apply to unsewered areas. Specifically, these are:

Public Wastewater Systems Program

Source Control Program

Private Onsite Systems Program

Rainwater Management / Drinking Water & Watershed Protection Program



Refer to Factsheet 2 for more detailed information on these programs.



LIQUID WASTE
MANAGEMENT PLAN

The RDN offers free workshops, online material, and printed SepticSmart kits for RDN residents with onsite systems. SepticSmart aims to provide information to empower homeowners to properly use and maintain their onsite system. See www.SepticSmart.ca for more information.



SepticSmart

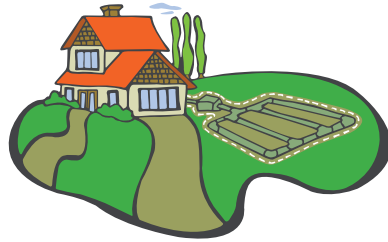


Financial Implications

Many of the LWMP programs which apply to unsewered areas are funded by the Liquid Waste Management Planning Service Establishment Bylaw (No. 1543). Annual revenue from this bylaw is relatively constant and costs the average household about \$2/year.

SepticSmart is funded by \$0.02/gallon of the septage receiving fees collected at the two RDN septage receiving fees. The annual revenue generated from septage receiving fees, and therefore for this service, is variable but estimated at \$30,000. The SepticSmart program falls under the Private Onsite Systems Program.

Some initiatives within the scope of the LWMP (under the Source Control and Rainwater Management / Drinking Water & Watershed Protection) are funded by the Action for Water program. This revenue source funds many projects outside the scope of the LWMP but should be noted.



SepticSmart

Sustainable Decision-making

All decision-making and actions undertaken by the RDN are founded on sustainability principles outlined in the Regional Growth Strategy (RGS). Fundamentally, sustainability means that the interrelationships between the environment, society and economic activity are recognized, understood and respected. As a result, decisions will move the region towards a more sustainable way of life.



Water is key to a healthy and resilient region for residents and the ecosystem that supports us all.

Through community outreach, collection and compilation of water resource data, well testing, water quality monitoring, and watershed planning, the Rainwater Management / Drinking Water & Watershed Protection Program is taking action to help protect our water resources.

The LWMP Amendment does not propose to make any changes to the funds collected for programs which affect unsewered properties.



For more information, visit the RDN's LWMP Amendment website at www.rdnlwmp.ca or contact Wastewater Services at (250) 390-6560, (250) 954-3792, or 1-877-607-4111. Alternately, you may email rcu@rdn.bc.ca.

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Factsheet 4: Wastewater Basics for Sewered Areas

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Wastewater Basics for Sewered Areas

WASTEWATER SERVICES FACTSHEET 4

WASTEWATER TREATMENT

Regional District of Nanaimo (RDN) wastewater treatment facilities provide either chemically-enhanced primary treatment or secondary treatment. Chemically-enhanced primary treatment is the same as primary treatment, except a polymer is added to make the settling process more efficient.

Primary wastewater treatment essentially uses gravity to treat the wastewater. Wastewater is screened (preliminary treatment) to remove larger objects. The remaining liquid moves slowly through large settling tanks. The tanks allow the lighter fats, oils, and grease to rise to the surface while the heavier materials settle to the bottom to form sludge. Fats, oil, and grease are skimmed off and sent to the landfill. The sludge is treated further, to become biosolids. The liquid in the “middle” is discharged to the Strait of Georgia as primary treated effluent.

Secondary treatment takes primary treatment a step further. This additional step uses bacteria to digest some of the material remaining in the “middle” liquid. As the bacteria eat soluble material, they produce “floc” which settles to become sludge, which is treated into biosolids. Meanwhile, the bacteria grow heavy and settle out. Since the secondary treatment process can produce more odours, foul air scrubbers and ultraviolet light may be used during the process to reduce the odours. In addition to being using to reduce odours, ultraviolet light can be used to disinfect the effluent. The RDN's secondary treated effluent is discharged to the Strait of Georgia. >

Biosolids are a useful resource with a compost-like texture. RDN biosolids meet provincial standards for quality and are beneficially used to fertilize trees in the Vancouver Island University Forest Fertilization Project.



BOTTOM SAMPLE AFTER BIOSOLIDS APPLICATION



FOUL AIR SCRUBBERS AT FRENCH CREEK POLLUTION CONTROL CENTRE



LIQUID WASTE MANAGEMENT PLAN


Wastewater
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 REGIONAL DISTRICT OF NANAIMO

WHY DO WE NEED TO PROVIDE SECONDARY WASTEWATER TREATMENT?

Secondary treatment facilities cost more to build and operate, and can produce more odours. However, secondary treatment produces a higher quality effluent than that produced by primary treatment. There are also more opportunities to recover resources from wastewater treated with secondary technology. As well, federal and provincial laws set mandatory minimum effluent quality standards that can be achieved only through secondary wastewater treatment or better.

Greater Nanaimo Pollution Control Centre

If you live in Nanaimo, Lantzville, or Snuneymuxw IR#1, and have sewer service, then your wastewater is treated at the Greater Nanaimo Pollution Control Centre (GNPCC), at 4600 Hammond Bay Road in Nanaimo. GNPCC provides chemically-enhanced primary treatment to an estimated population of 86,068 people.

If you are one of these people, refer to Factsheet 5 for more information.

French Creek Pollution Control Centre

If you live in Parksville, Qualicum Beach, French Creek, Surfside, Barclay Crescent or Pacific Shores; and have sewer service; then your wastewater is treated at the French Creek Pollution Control Centre (FCPCC), at 957 Lee Road in Parksville. FCPCC provides secondary treatment to an estimated population of 26,047 people.

If you are one of these people, refer to Factsheet 6 for more information.

Nanoose Bay Pollution Control Centre

If you live in Fairwinds, or are one of a few neighbouring properties with sewer service, then your wastewater is treated at the Nanoose Bay Pollution Control Centre (NBPCC), at 3260 Schooner Cove Drive in Nanoose Bay. NBPCC provides chemically-enhanced primary treatment to an estimated population of 1,350 people.

If you are one of these people, refer to Factsheet 7 for more information.

Duke Point Pollution Control Centre

If you are one of a few properties in Cedar Village with sewer service, then your wastewater is treated at the Duke Point Pollution Control Centre (DPPCC), at 625 Jackson Road in Nanaimo. DPPCC is a very small facility which also treats wastewater from the Duke Point Industrial Park and BC Ferries. No major changes are proposed for DPPCC at this time.



VIEW FROM INSIDE THE CHASE RIVER PUMP STATION



CONSTRUCTION OF THE DIGESTERS AT THE GREATER NANAIMO POLLUTION CONTROL CENTRE



For more information, visit the RDN Wastewater Services website at www.rdn.bc.ca or contact Wastewater Services at (250) 390-6560, (250) 954-3792, or 1-877-607-4111. Alternately, you may email rcu@rdn.bc.ca.



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Factsheet 5: What does the LWMP Amendment Mean for Nanaimo and Lantzville Residents with Sewer Service?

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What does the LWMP Amendment Mean for Nanaimo and Lantzville Residents with Sewer Service?

The Regional District of Nanaimo (RDN) Liquid Waste Management Plan (LWMP) has a number of programs which apply to sewerage areas in Nanaimo and Lantzville. Specifically, these are:

- Source Control Program
- Rainwater Management / Drinking Water & Watershed Protection Program
- Volume Reduction
- Inflow and Infiltration Program
- **Pollution Control Centres Program**
- Odour Control Program
- Resource Recovery Program
- Biosolids Program.

Refer to Factsheet 2 for detailed information on these programs.

GREATER NANAIMO POLLUTION CONTROL CENTRE

If you live in Lantzville, Nanaimo, or Snuneymuxw IR#1 and have sewer service, then your wastewater is treated at the Greater Nanaimo Pollution Control Centre (GNPCC). GNPCC currently provides chemically-enhanced primary wastewater treatment to an estimated population of approximately 86,068 people.

The LWMP Pollution Control Centre Program identifies two major projects at the GNPCC which will have an impact on users in this service area. 1) GNPCC Outfall Replacement and 2) Required Secondary Treatment Upgrades. The LWMP Amendment proposes to increase the revenue collected to fund these two projects. >

Provincial and Federal Laws Require Secondary Wastewater Treatment or Better

Municipal wastewater treatment is governed by the provincial Municipal Wastewater Regulation (MWR) and federal Wastewater Systems Effluent Regulations (WSER). These regulations include mandatory minimum effluent quality standards that can be achieved through secondary wastewater treatment or better. They also include requirements for monitoring, record-keeping, reporting and toxicity testing.



LIQUID WASTE MANAGEMENT PLAN



INSTALLATION OF THE ORIGINAL GREATER NANAIMO POLLUTION CONTROL CENTRE OUTFALL IN 1974.



Outfall Replacement

The GNPCC outfall that discharges treated effluent to the Strait of Georgia was designed to last until 2040. However, the pipe has corroded and must be replaced in the near future. The RDN recently committed \$18 million to replace the GNPCC effluent outfall by 2015. The RDN has secured \$2 million in Gas Tax funds for this project. The RDN has also established significant reserve and Development Cost Charge (DCC) funds to support capital projects. Still, those funds will be largely depleted with the completion of the outfall replacement project and borrowing will be necessary for the secondary treatment upgrade.

Secondary Treatment Upgrades

The original LWMP (1997) projected that GNPCC would be upgraded to provide secondary treatment by 2015. The provision of secondary treatment at GNPCC will cost those in the Greater Nanaimo Sewer Service Area an estimated \$61.8 million (2012 dollars). The tax burden on individual taxpayers would be extremely high if both outfall replacement and secondary upgrades were completed by 2015. For that reason, the RDN is requesting an amendment to the timeline for secondary treatment upgrades at GNPCC.

The RDN has considered a number of timing options for secondary treatment. The RDN presents three feasible timing options for discussion and to solicit feedback during the consultation process. These options include upgrading GNPCC by 2016, 2018, or 2019. All options meet the timeline required under the new Wastewater Systems Effluent Regulations (WSER). As well, all options are in line with recent precedent set by the 2011 Environment Minister's approval of the Metro Vancouver LWMP Amendment, requiring upgrade of the Lions Gate Wastewater Treatment Plant by 2020.

The following rationale supports the proposed 2016 date:

- 2016 is the closest scenario to 2015, the date proposed in the 1997 LWMP.

The following rationale supports the proposed 2018 date:

- 2018 allows for a realistic project timeline to complete engineering and construction activities
- Tax implications are similar to the scenario with completion in 2019.

The following rationale supports the proposed 2019 date:

- 2019 allows for the lowest tax increase.

Each option has technical, social, environmental and economic implications. These Implications are considered on the following pages. >

Sustainable Decision-making

All decision-making and actions undertaken by the RDN are founded on sustainability principles outlined in the Regional Growth Strategy (RGS). Fundamentally, sustainability means that the interrelationships between the environment, society and economic activity are recognized, understood and respected. As a result, decisions will move the region towards a more sustainable way of life.



SEBASTIAN BEACH, LANTZVILLE.

Last updated August 2013



Technical Considerations

Criteria	General Comments	< Options >		
		1. 2016	2. 2018	3. 2019
Feasibility of engineering/construction schedule	Feasibility of target date when compared to established average project timelines for design, procurement and construction of similar projects	Fast track, timelines present significant challenges that limit feasibility and likely result in cost premiums and reduced functionality	Adequate timeframe for project completion	Adequate timeframe for project completion
Opportunities for innovation, optimization	Innovation in the areas of process optimization, resource recovery, reduced energy consumption, flexibility, better performance require time and consideration at the design phase	Fast track timelines limit opportunities for design consideration of potential opportunities	Adequate timeline for consideration of innovation opportunities	Adequate timeline for consideration of innovation opportunities
Mitigate potential climate change impacts on facility	Consideration of potential climate change impacts to infrastructure	Adequate timeline to consider infrastructure impacts	Adequate timeline to consider infrastructure impacts	Adequate timeline to consider infrastructure impacts
Opportunities for future expandability	Analysis of opportunities for future population increases and climate change related capacity impacts required at design phase	Fast track timelines limit opportunities for consideration of expandability	Adequate timeline for consideration of expansion opportunities	Adequate timeline for consideration of expansion opportunities

Environmental Considerations

Criteria	General Comments	< Options >		
		1. 2016	2. 2018	3. 2019
Meet Provincial MWR Standards	All options meet these criteria	Achieved earliest	Achieved 2 years after Option 1	Achieved 3 years after Option 1
Meet Federal WSER standards	All options meet these criteria within WSER deadlines	Achieved earliest	Achieved 2 years after Option 1	Achieved 3 years after Option 1
Protect the environment	Implementation of secondary treatment will reduce the potential for impacts to human health and the receiving environment	Achieved earliest	Achieved 2 years after Option 1	Achieved 3 years after Option 1
Improved effluent quality	Secondary treatment will reduce TSS and BOD discharge concentrations	Achieved earliest	Extends primary discharge by 2 years relative to Option 1	Extends primary discharge by 3 years relative to Option 1
Minimize carbon footprint	Related in large part to resource recovery opportunities	Fast track schedule limits opportunities	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria

Environmental Considerations

Criteria	General Comments	< Options >		
		1. 2016	2. 2018	3. 2019
Identify resource recovery opportunities	Possible opportunities include: heat recovery; bio-solids management; biogas generation	Fast track schedule limits opportunities	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria
Flexibility for future resource recovery opportunities	Design in flexibility for potential future opportunities	Fast track schedule limits opportunities	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria
Reduce treatment plant site impacts	Potential impacts include habitat disruption, site ecological sensitivity	Existing developed site, minimal impact anticipated	Existing developed site, minimal impact anticipated	Existing developed site, minimal impact anticipated
Minimize geotechnical concerns	Includes site suitability, stability	Existing developed site	Existing developed site	Existing developed site

Social Considerations

Criteria	General Comments	< Options >		
		1. 2016	2. 2018	3. 2019
Construction disruption	Construction activities will create potential disruption and inconvenience for local residents. Appropriate mitigation measures are required for noise, odours, dust, and traffic	Earliest completion of construction activities. Fast track schedule may impact ability to effectively mitigate impacts	Schedule may allow design for better mitigation	Schedule may allow design for better mitigation
Disruption from ongoing operations (noise, odours, dust, traffic)	Require design for proper mitigation of potential impacts during ongoing operations	Adequate timeframe for mitigation by design	Adequate timeframe for mitigation by design	Adequate timeframe for mitigation by design
Facility/site Aesthetics	Aesthetics include proper screening and integration with neighbourhood	Adequate timeframe for mitigation by design	Adequate timeframe for mitigation by design	Adequate timeframe for mitigation by design
Archaeological/cultural Resources	Construction activities will require proper consideration and procedures to mitigate potential impacts to cultural artifacts	Adequate timeframe for mitigation of risks	Adequate timeframe for mitigation of risks	Adequate timeframe for mitigation of risks
Property values	Facility expansion could affect local property values. Design and construction needs to minimize potential impacts	Similar impact potential for all options	Similar impact potential for all options	Similar impact potential for all options

Social Considerations

Criteria	General Comments	< Options >		
		1. 2016	2. 2018	3. 2019
Public perception	Extending timeframe for achieving secondary treatment may negatively impact public perceptions. Potential tourism, recreation and related economic impacts	Minimizes potential	Extends potential impacts by 2 years relative to Option 1	Extends potential impacts by 3 years relative to Option 1
Loss of beneficial site uses	Existing facility is located adjacent to Neck Point Park. Integration with the park has provided reciprocal benefits	Minimal impacts anticipated	Minimal impacts anticipated	Minimal impacts anticipated
Compatibility with land use zoning	Existing facility is located in an area surrounded by park, school and residential	Established compatibility with existing facility	Established compatibility with existing facility	Established compatibility with existing facility

Economic Considerations

Criteria	General Comments	< Options >		
		1. 2016	2. 2018	3. 2019
Capital Cost Optimization	Minimizing capital cost is most effectively carried out during the design phase	Fast track project reduces ability to consider capital cost optimization opportunities	Adequate timeline for capital cost optimization	Adequate timeline for capital cost optimization
Operating cost Optimization	Minimizing operating cost is most effectively carried out during the design phase. Fast tracking may result in increased capital costs	Fast track project reduces ability to consider operating cost optimization opportunities	Adequate timeline for operating cost optimization	Adequate timeline for operating cost optimization
Tax rate impacts	Timing of project expenditure has a significant impact on tax burden resulting from the project	Highest tax burden imposed on taxpayers	Tax burden significantly lower than Option 1	Tax burden significantly lower than Option 1
Revenue Opportunities	Revenue opportunities flow primarily from resource recovery opportunities	Fast track schedule limits opportunities	Adequate timeline to consider revenue generating opportunities	Adequate timeline to consider revenue generating opportunities
Opportunities to secure grants and funding	Currently no funding opportunities have been identified from provincial or federal sources	Shortest timeline to secure funding opportunities	Better timeline to explore funding opportunities	Best timeline to explore funding opportunities
Synergies with other large treatment projects	Metro Van and CRD are undertaking large secondary treatment projects as well. There may be opportunities to reduce costs for all parties through effective coordination	Fast track timeline limits opportunities	Adequate timeline to explore opportunities	Adequate timeline to explore opportunities

Outfall replacement will benefit existing and future users, therefore RDN plans to finance both project with Development Cost Charges (DCCs), reserves, tax requisitions, and debt (amortized over 20 years). There is an expected DCC shortfall and the remainder of the costs will be funded by general reserves and long term debt. However, the RDN will continue to collect DCCs which will cover a portion of the debt.

Provincial and federal cost-sharing is sometimes available to projects such as these. The RDN will continue to pursue federal and provincial grant options to fund secondary treatment at GNPCC. For

that reason, three funding scenarios (no grant, 1/3 grant and 2/3 grant) are provided and each scenario has implications on potential tax increases.

The current average tax is \$104 per year, based on an average house in Nanaimo with an assessed value of \$350,000. To fund the secondary treatment upgrade at GNPCC, sewer taxes could increase over 2013 taxes by an average of \$6-19/year from 2014 to 2022 for a total increase of \$57-164 after nine years (see table below). This means that the average household tax may be \$161-\$268 in 2022.

Potential Average Sewer Tax Increase for GNPCC Secondary Treatment Upgrade by 2016, 2018, or 2019, with Three Cost Sharing Scenarios.

Cost sharing scenario	2013 Tax (average)	Potential tax increase phased in from 2014-2022					
		Option 1. 2016		Option 2. 2018		Option 3. 2019	
		Average Annual Increase	Tax in 2022	Average Annual Increase	Tax in 2022	Average Annual Increase	Tax in 2022
No Grant	\$104	\$18	\$268	\$15	\$238	\$13	\$224
1/3 Grant		\$12	\$213	\$10	\$194	\$9	\$185
2/3 Grant		\$8	\$179	\$7	\$167	\$6	\$161

Note, tax increase is phased incrementally in from 2014-2022. Amounts are based on an average house in Nanaimo with an assessed value of \$350,000. Cost-sharing (grants) apply only to construction costs and do not cover the costs of operation.

i For more information, visit the RDN Wastewater Services website at www.rdn.bc.ca or contact Wastewater Services at (250) 390-6560, (250) 954-3792, or 1-877-607-4111. Alternately, you may email rcu@rdn.bc.ca.



Factsheet 6: What does the LWMP Amendment Mean for Parksville, Qualicum Beach, French Creek and Area Residents with Sewer?

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What does the LWMP Amendment Mean for Parksville, Qualicum Beach, French Creek and Area Residents with Sewer?

If you live in Parksville, Qualicum Beach, French Creek, Surfside, Barclay Crescent or Pacific Shores; and have sewer service; then your wastewater is treated at the French Creek Pollution Control Centre (FCPCC), at 957 Lee Road in Parksville. FCPCC provides secondary treatment to an estimated population of 26,047 people.

The Regional District of Nanaimo (RDN) Liquid Waste Management Plan (LWMP) has a number of programs which apply to sewered areas in Parksville, Qualicum Beach, French Creek, Surfside, Barclay Crescent, and Pacific Shores. Specifically, these are:

- Source Control Program
- Rainwater Management / Drinking Water & Watershed Protection Program
- Volume Reduction
- Inflow and Infiltration Program
- **Pollution Control Centres Program**
- Odour Control Program
- Resource Recovery Program
- Biosolids Program.

Refer to Factsheet 2 for detailed information on these programs.

Sustainable Decision-making

All decision-making and actions undertaken by the RDN are founded on sustainability principles outlined in the Regional Growth Strategy (RGS). Fundamentally, sustainability means that the interrelationships between the environment, society and economic activity are recognized, understood and respected. As a result, decisions will move the region towards a more sustainable way of life.



LIQUID WASTE MANAGEMENT PLAN



FRENCH CREEK CONTROL CENTRE

Odour Control

Since 1997, the RDN has implemented extensive odour control measures at wastewater treatment facilities. For example, the RDN established a hydrogen sulphide monitoring program and established "odour procedures" in the Environmental Management System to ensure that staff eliminate or reduce odours during routine duties and respond within 24 hours to odour complaints. To further control odour >



at FCPCC, the RDN installed chemical scrubbers and added ferrous chloride and biological scrubbers to neutralize hydrogen sulphide and installed ion generators and enclosed odour-generating areas at Bay Avenue, Lee Road, and Hall Road Pump Stations. As a result, the number of complaints received for odours at FCPCC dropped from 227 in 1999 to none in 2011.

Resource Recovery

During the summer months, FCPCC sends up to 1,370 cubic metres per day (m³/day) of its treated effluent to Morningstar Golf Course for irrigation. Reclaimed water is also used at FCPCC during operations in place of potable water. Beneficial effluent reuse lessens the demand on the potable water supply and reduces the volume discharged to the ocean.

FCPCC produces high quality biosolids which are beneficially used at the Vancouver Island University woodlot to fertilize trees in the Forest Fertilization Project. Biosolids application can increase tree growth from 50% to 400%. Trees treated with biosolids also appear greener and have longer needles and buds.

Capital Projects

Capital projects planned for FCPCC include the replacement of some ageing infrastructure as well as the expansion of the plant to accommodate population growth.

Economic Implications

These replacement and expansion projects will cost an estimated \$32 million and are scheduled for 2018-2025. Based on current population estimates, 85% of the expansion will accommodate new population growth and 15% will benefit existing users. FCPCC expansion and upgrades will be financed by a combination of development cost charges (DCCs), accumulated capital reserves, long term debt, and property taxes. Due to low growth in the past four years, DCC collection was considerably lower than expected. As well, \$2 million in DCC have been applied to projects at FCPCC since 2008. As a result, a DCC shortfall is expected and the remainder of the costs will be funded by general reserves and long term debt. DCCs will continue to be collected after borrowing and may be used to cover a portion of the debt. Additionally, DCC rates are reviewed approximately every five years to ensure they reflect the most recent project estimates as well as changes in growth projections.

To fund the major capital projects at FCPCC, sewer taxes may increase over the next nine years, by \$11 to 14 per year, starting in 2014, for a total of \$99-126 over nine years, shown below. This means that the average household sewer tax may be \$345-372 in 2022. Currently, provincial and federal grant funding is not applicable to expansion projects.

Potential Average Sewer Tax Increase for FCPCC Infrastructure Replacement and Expansion

Grant Funding	2013 Tax (average)	Potential tax increase phased in incrementally from 2014-2022		
		Average Annual Increase	Total 9-year Increase	Tax in 2022
Not applicable	\$246	\$11-14	\$99-126	\$345-372

Note, rates listed are approximations based on an average of City of Parksville and Town of Qualicum Beach average household rates and an average assessed value of \$350,000. Estimates assume debt is amortized over 20 years.



For more information, visit the RDN Wastewater Services website at www.rdn.bc.ca or contact Wastewater Services at (250) 390-6560, (250) 954-3792, or 1-877-607-4111. Alternately, you may email rcu@rdn.bc.ca.



Factsheet 7: What does the LWMP Amendment Mean for Nanoose Residents with Sewer Service?

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What does the LWMP Amendment Mean for Nanoose Residents with Sewer Service?

The Regional District of Nanaimo (RDN) Liquid Waste Management Plan (LWMP) has a number of programs which apply to sewered areas in Nanoose. Specifically, these are:

- Source Control Program
- Rainwater Management / Drinking Water & Watershed Protection Program
- Volume Reduction
- Inflow and Infiltration Program
- **Pollution Control Centres Program**
- Odour Control Program
- Resource Recovery Program
- Biosolids Program.

Refer to Factsheet 2 for detailed information on these programs.

NANOOSE BAY POLLUTION CONTROL CENTRE

If you live in Nanoose Bay (including Fairwinds) and have sewer service, then your wastewater is treated at the Nanoose Bay Pollution Control Centre (NBPCC). NBPCC currently provides chemically-enhanced primary wastewater treatment to a population of approximately 1,350 people.

The LWMP Pollution Control Centre Program identifies capital upgrade and expansion projects associated with RDN wastewater treatment facilities, including secondary treatment upgrades at NBPCC.

Secondary Treatment Upgrades

The original LWMP (1997) projected an upgrade from primary to secondary treatment by 2010. Funding for the upgrade was based on projected growth and service area expansion which did not occur. Since services are based on a user pay principle, through the existing service area bylaw, the cost of upgrading and operating the NBPCC must be born entirely by Nanoose residents living within the service area. >

Provincial and Federal Laws Require Secondary Wastewater Treatment or Better

Municipal wastewater treatment is governed by the provincial Municipal Wastewater Regulation (MWR) and federal Wastewater Systems Effluent Regulations (WSER). These regulations include mandatory minimum effluent quality standards that can be achieved through secondary wastewater treatment or better. They also include requirements for monitoring, record-keeping, reporting and toxicity testing.



LIQUID WASTE
MANAGEMENT PLAN



Without the population base, the project cannot proceed as planned in 1997. For that reason, the LWMP Amendment is requesting changes to the timeline for secondary treatment upgrades at NBPCC.

The RDN has considered a number of timing options for secondary treatment. The LWMP Amendment presents three feasible timing options for discussion and to solicit feedback during the consultation process. These options include upgrading NBPCC by 2020, 2025, or 2030.

2020 is proposed because it is the nearest feasible scenario. 2025 is proposed because it is a moderate option between 2020 and 2030. The following rationale supports the proposed 2030 date:

- 2030 allows for the lowest tax increase, particularly in the long-term
- 2030 is well within federal WSER requirements
- 2030 is in line with recent precedent set when the 2011 Environment Minister's approved Metro Vancouver LWMP amendment, requiring upgrade of their Iona Island Wastewater Treatment Plant by 2030 (for comparison, NBPCC represents less than 0.05 % of the flow of the Iona Island facility).

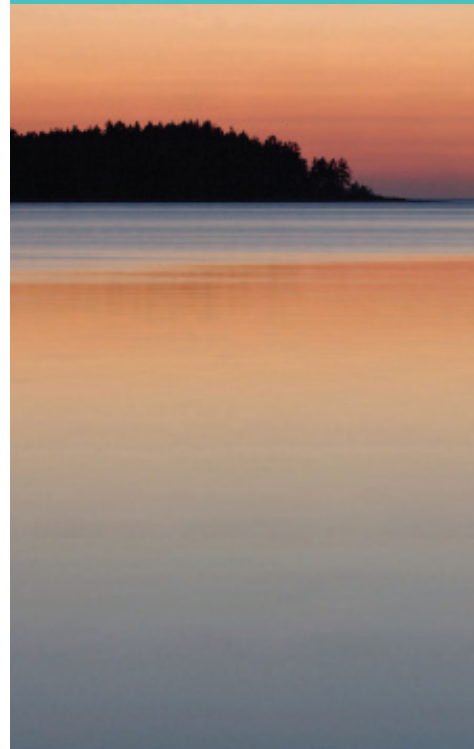
Each option has technical, social, environmental and economic implications. These Implications are considered on the following pages. >



NANOOSE BAY POLLUTION CONTROL CENTRE

Sustainable Decision-making

All decision-making and actions undertaken by the RDN are founded on sustainability principles outlined in the Regional Growth Strategy (RGS). Fundamentally, sustainability means that the interrelationships between the environment, society and economic activity are recognized, understood and respected. As a result, decisions will move the region towards a more sustainable way of life.



Last updated August 2013



Technical Considerations

Criteria	General Comments	< Options >		
		1. 2020	2. 2025	3. 2030
Feasibility of engineering/construction schedule	Feasibility of target date when compared to established average project timelines for design, procurement and construction of similar projects	Adequate timeframe for project completion	Adequate timeframe for project completion	Adequate timeframe for project completion
Opportunities for innovation, optimization	Innovation in the areas of process optimization, resource recovery, reduced energy consumption, flexibility, better performance require time and consideration at the design phase	Adequate timeline for consideration of innovation opportunities	Adequate timeline for consideration of innovation opportunities	Adequate timeline for consideration of innovation opportunities
Mitigate potential climate change impacts on facility	Consideration of potential climate change impacts to infrastructure	Adequate timeline to consider infrastructure impacts	Adequate timeline to consider infrastructure impacts	Adequate timeline to consider infrastructure impacts
Opportunities for future expandability	Design needs to consider potential provision of sewage treatment for new developments (i.e. Fairwinds, and expanding service area to existing neighbourhoods.	Adequate timeline for consideration of expansion opportunities	Adequate timeline for consideration of expansion opportunities	Adequate timeline for consideration of expansion opportunities

Environmental Considerations

Criteria	General Comments	< Options >		
		1. 2020	2. 2025	3. 2030
Meet Provincial MWR Standards	All options meet these criteria, although with significant timing differences	Achieved earliest	Achieved 5 years after Option 1	Achieved 10 years after Option 1
Meet Federal WSER standards	All options meet these criteria within WSER deadlines	Achieved earliest	Achieved 5 years after Option 1	Achieved 10 years after Option 1
Protect the environment	Implementation of secondary treatment will reduce potential for impacts to organisms in the receiving environment	Achieved in shortest time	Extends potential impacts by 5 years relative to Option 1	Extends potential impacts by 10 years relative to Option 1
Improved effluent quality	Secondary treatment will reduce TSS and BOD discharge concentrations. Significant timing differences between options	Achieved in shortest time	Extends primary discharge by 5 years relative to Option 1	Extends primary discharge by 10 years relative to Option 1
Minimize Carbon footprint	Related in large part to resource recovery opportunities	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria

Environmental Considerations

Criteria	General Comments	< Options >		
		1. 2020	2. 2025	3. 2030
Identify resource recovery opportunities	Possible opportunities include: heat recovery; bio-solids management; biogas generation	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria
Flexibility for future Resource Recovery opportunities	Design and construct with consideration of possible future resource recovery opportunities	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria	Adequate timeframe to achieve criteria
Reduce treatment plant site impacts	Potential impacts include habitat disruption, site ecological sensitivity	Existing developed site, minimal impact anticipated	Existing developed site, minimal impact anticipated	Existing developed site, minimal impact anticipated
Minimize geotechnical concerns	Includes site suitability, stability	Existing developed site	Existing developed site	Existing developed site

Social Considerations

Criteria	General Comments	< Options >		
		1. 2020	2. 2025	3. 2030
Construction disruption	Construction activities will create potential disruption and inconvenience for local residents. Appropriate mitigation measures are required for noise, odours, dust, and traffic	Schedule will allow design for minimal disruption. Need to consider potential impacts on future Fairwinds	Schedule will allow design for minimal disruption. Need to consider potential impacts on future Fairwinds	Schedule will allow design for minimal disruption. Need to consider potential impacts on future Fairwinds
Disruption from ongoing operations (noise, odours, dust, traffic)	Require design for proper mitigation of potential impacts during ongoing operations	Adequate timeframe for mitigation by design	Adequate timeframe for mitigation by design	Adequate timeframe for mitigation by design
Facility/site Aesthetics	Aesthetics include proper screening and integration with neighbourhood	Adequate timeframe for mitigation by design	Adequate timeframe for mitigation by design	Adequate timeframe for mitigation by design
Archaeological/cultural Resources	Construction activities will require proper consideration and procedures for potential impacts to cultural artifacts	Adequate timeframe to mitigate risks	Adequate timeframe to mitigate risks	Adequate timeframe to mitigate risks
Property values	Facility expansion could affect local property values. Design and construction needs to minimize potential impacts	Similar impact potential for all options	Similar impact potential for all options	Similar impact potential for all options

Social Considerations

Criteria	General Comments	< Options >		
		1. 2020	2. 2025	3. 2030
Public perception	Extending timeframe for achieving secondary treatment may negatively impact public perceptions. Potential tourism, recreation and related economic impacts	Minimizes potential	Extends potential impacts by 5 years relative to Option 1	Extends potential impacts by 10 years relative to Option 1
Loss of beneficial site uses	Existing facility is located adjacent to land designated as park	Minimal impacts anticipated	Minimal impacts anticipated	Minimal impacts anticipated
Compatibility with land use zoning	Existing facility is located in an area surrounded by park and residential	Established compatibility with existing facility	Established compatibility with existing facility	Established compatibility with existing facility

Economic Considerations

Criteria	General Comments	< Options >		
		1. 2020	2. 2025	3. 2030
Capital Cost Optimization	Minimizing capital cost is most effectively carried out during the design phase	Adequate timeline for capital cost optimization	Adequate timeline for capital cost optimization	Adequate timeline for capital cost optimization
Operating cost Optimization	Minimizing operating cost is most effectively carried out during the design phase. Fast tracking may result in increased capital costs	Adequate timeline for operating cost optimization	Adequate timeline for operating cost optimization	Adequate timeline for operating cost optimization
Tax rate impacts	Timing of project expenditure has a significant impact on tax burden resulting from the project	Highest tax burden imposed on taxpayers	Tax burden significantly lower than Option 1, but higher than Option 3	Tax burden significantly lower than Options 1 + 2
Revenue Opportunities	Revenue opportunities flow primarily from resource recovery opportunities	Adequate timeline to consider revenue generating opportunities	Adequate timeline to consider revenue generating opportunities	Adequate timeline to consider revenue generating opportunities
Opportunities to secure grants and funding	Currently no funding opportunities have been identified from provincial or federal sources	Option with shortest timeline to secure funding opportunities	Adequate timeline to explore funding opportunities	Best timeline to explore funding opportunities

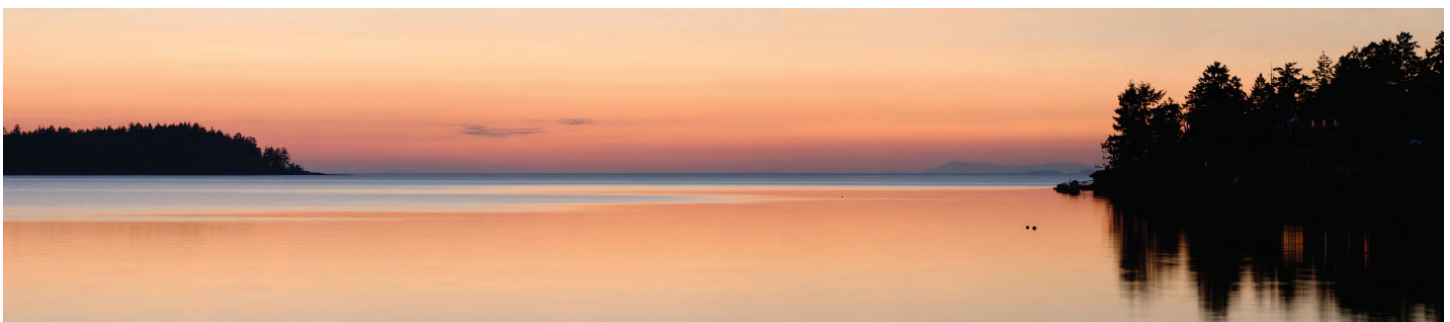
The provision of secondary treatment at NBPCC will cost those in the Nanoose Bay Sewer Service Area an estimated \$4.1 million (2012 dollars). Provincial and federal cost-sharing is sometimes available to projects such as these. The RDN will continue to pursue federal and provincial grant options to fund secondary treatment at GNPCC. For that reason, three funding scenarios (no grant, 1/3 grant and 2/3 grant) are provided.

The current average tax. To fund the secondary treatment upgrade at NBPCC, sewer taxes could increase over 2013 rates by an average of \$12-27/ year from 2014-2031 for a total increase of \$211-493 after 18 years (see table below). This means that the average household taxes may be \$833-\$1,115 in 2031.

Potential Average Sewer Tax Increase for NBPCC Secondary Treatment Upgrade by 2020, 2025, or 2030, with Three Cost Sharing Scenarios.

Cost sharing scenario	2013 Tax (average)	Potential tax increase phased in incrementally from 2014-2031					
		Option 1. 2020		Option 2. 2025		Option 3. 2030	
		Average Annual Increase	Tax in 2031	Average Annual Increase	Tax in 2031	Average Annual Increase	Tax in 2031
No Grant	\$622	\$27	\$1,115	\$20	\$983	\$19	\$966
1/3 Grant		\$20	\$982	\$15	\$885	\$16	\$916
2/3 Grant		\$14	\$863	\$13	\$852	\$12	\$833

Note, tax increase is phased incrementally in from 2014-2031. Cost-sharing (grants) apply only to construction costs and do not cover the costs of operation.



For more information, visit the RDN Wastewater Services website at www.rdn.bc.ca or contact Wastewater Services at (250) 390-6560, (250) 954-3792, or 1-877-607-4111. Alternately, you may email rcu@rdn.bc.ca.

