SURREY
CITY OF PARKS

Corporate Report

NO: R061

COUNCIL DATE: April 28, 2008

REGULAR COUNCIL

TO:	**Mayor & Council**	DATE:	**April 24, 2008**
FROM:	**General Manager, Engineering**	FILE:	**0458-20 (LWMP)**
SUBJECT:	**Development of a New Regional Liquid Waste Management Plan (LWMP)**		

RECOMMENDATIONS

The Engineering Department recommends that Council:

1. Receive this report for information; and

2. Authorize staff to forward a copy of this report and the related Council resolution to Metro Vancouver as input from the City of Surrey into the new LWMP.

INTENT

The purpose of this report is to provide information about the process related to development of new Regional Liquid Waste Management Plan and to document comments that are considered to be reasonable input by the City of Surrey to the development of this new Plan.

BACKGROUND

Under Provincial legislation, Metro Vancouver (GVS&DD) is required to have a Liquid Waste Management Plan (LWMP) to operate regional treatment plants and trunk sewers. The LWMP sets a series of operational requirements such as:

- Level of wastewater treatment and quality of the discharge;
- Conditions under which sanitary sewer and combined sewer overflows can occur and actions to be taken to reduce these overflows;
- Source control by-laws which set standards of discharge for industry users;
- Actions that the member municipalities commit to take to manage stormwater;

- Actions that the member municipalities commit to take to maintain, in functional condition, their respective sanitary sewer systems, including private service connections.

The current Liquid Waste Management Plan was approved by the Provincial Minister of Environment in 2002. This Plan included a commitment that it would be updated after 5 years.

Updating the Plan

As part of the process to update the LWMP, Metro Vancouver has developed a discussion paper, a copy of which is attached to this report (Appendix I). A series of public meetings are being held throughout the region to discuss the Plan and the issues and opportunities related to the Plan. The following sections of this report list the key issues identified in the discussion paper and following each are staff comments:

Strengthening Source Controls

In Surrey, source control for industrial and commercial customers is regulated by the Regional Source Control By-law and is enforced by Regional staff. Surrey supports appropriate source controls to protect the public sewer infrastructure from premature wear and to reduce the costs of sewage treatment. Surrey is in the process of developing revised policies related to source controls in the City and will be working with Metro Vancouver staff in implementing these measures subject to Council approval. A separate Corporate report on this matter will be forwarded to Council in due course.

Improving Asset Management

Properly managing the sewer infrastructure (regional, municipal and private) is clearly important, in that aging sewers become prone to leaks, increased infiltration and failures with consequent overflows or service interruptions. The region has a relatively small length of large diameter trunk systems, whereas municipalities and private systems have a much greater length of smaller diameter pipes. The City of Surrey has a comprehensive monitoring program for its sewer mains, but does not monitor private systems. The City is in the process of developing a systematic replacement plan for the sanitary sewer system as part of its overall asset management program. Private sewer connections are currently only addressed if they fail or when the property to which the service is connected is redeveloped / reconstructed. Programs for the systematic replacement / rehabilitation of private sewer connections will need to be developed and implemented over time. Leaky private sewer connections are not a major problem in Surrey at present but will become more so with time.

Municipal Stormwater Management – New Stormwater Practices for New Development

Under the existing the current Regional Stormwater Plan (SWP), municipalities are to develop an Integrated Stormwater Management Plan (ISMP) for each watershed within their jurisdiction by 2014. The development of such plans is currently in process for

Surrey but due to the number of stakeholders that are affected by such plans and the complexity of these plans, the task is time consuming and is proving to be slower than anticipated. Completing an ISMP for every watershed in Surrey by 2014 will be a challenge. The discussion document calls for municipalities to implement actions identified in the ISMPs for all new development, which is, to a great extent, already being accomplished in Surrey since ISMPs have been completed for most NCP areas where the majority of development in the City is occurring. The discussion document also calls for municipalities to formally link their stormwater and land use plans, which again has been accomplished through the NCP process that is used in Surrey.

Materials and Energy Recovery and Water Re-Use

Material and energy recovery in the context of the LWMP relates to the materials that are processed at the treatment plants. Clearly, material and energy recovery are fundamental to sustainability and should be undertaken to the extent practical within reasonable economic justification.

Combined Sewer Issues

Vancouver, New Westminster and parts of Burnaby still have combined sewers (i.e., stormwater and sanitary sewage flows into the same sewer pipe). The LWMP sets dates for these combined systems to be separated into a two-pipe system. This is not an issue for Surrey, as the City of Surrey does not have any combined sewers.

Timing for Secondary Treatment for Vancouver and North Shore Plants

Under the regional cost allocation formula, all member municipalities contribute toward implementing secondary treatment at all of the regional treatment plants. The Annacis Island plant, which provides service to Surrey, has already been upgraded to secondary treatment. Because of the cost allocation formula, the timing of secondary treatment at Vancouver and the North Shore plants will have a direct financial impact on Surrey. Extensive environmental monitoring has not identified any environmental need to upgrade either the Vancouver plant or the North Shore plant to secondary treatment. However, as a condition of Provincial approval in 2003, target dates for upgrading these plants to secondary treatment were set as follows:

- Vancouver Plant ($1 billion) – 2020
- North Shore Plant ($400 million) – 2030

Applying new Federal-Provincial guidelines for wastewater treatment would indicate that the above-noted order for the upgrades could be switched. Switching the order for upgrading of the plants is much less costly up to 2030. However, should Federal / Provincial regulatory agencies require that both plants be upgraded by 2020, this would result in considerable additional costs to Surrey sewer customers. The sewer rate for an average single family home would increase by about $100 per year across the region on average with the increase in Surrey being about $70 to $80. Currently the average single family home in Surrey pays $220 per year for metered sewer service, of which $100 is for regional costs.

General Comment:

It is important to note that there are a number of significant regional services that are all experiencing a need for new infrastructure. There are:

- Sanitary sewer trunks and treatment plants (the subject of this report);
- Water supply, treatment and trunk delivery;
- Solid Waste management; and
- TransLink (major road network and public transit).

Decisions and the related financial requirements related to any one of these areas of service should not be made in isolation of an understanding of the needs and financial requirements in the other areas of service since it is the same rate/tax payer that is footing the collective financial impacts in all of these areas. Likewise, any increases that the Region imposes on the property tax bill will tend to limit the ability of local governments to increase property taxes to fund needed local services.

CONCLUSION

Based on the above discussion, it is recommended that Council authorize staff to forward a copy of this report and the related Council resolution to Metro Vancouver as preliminary input from the City of Surrey to the development of new LWMP.

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Appendix I - Strategy for Updating the Liquid Waste Management Plan

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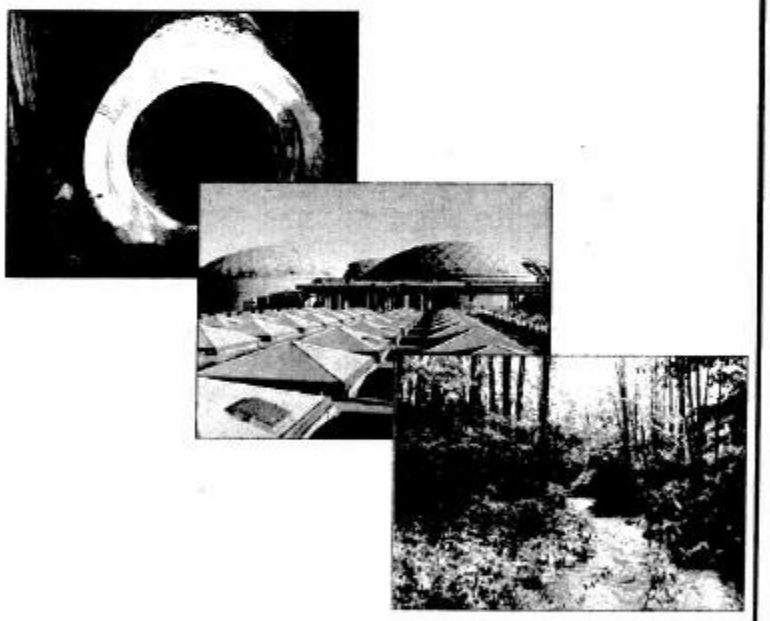
SUSTAINABLE REGION INITIATIVE . . . TURNING IDEAS INTO ACTION

Strategy for Updating the Liquid Waste Management Plan

January 2008

Discussion Document



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1. Liquid Waste Management Approach

The Liquid Waste Management Plan was approved in 2002 and is to be updated every five years. Updating the Plan offers an opportunity to consider past progress and include actions to address new issues and opportunities.

The purpose of this discussion document is to review the key opportunities to improve upon the existing plan and receive input so that Metro Vancouver has a clear strategy to revise and update the current Liquid Waste Management Plan.

The key liquid waste management areas for discussion and direction are:

- Strengthening source controls—what more is needed?
- Improving sewer asset management: Metro Vancouver, municipal and private
- Adopting new stormwater practices for new developments
- Recovering materials, water reuse and energy—where are the opportunities?
- The timing and order of providing secondary treatment to Vancouver and North Shore Sewerage Areas (Iona Island and Lions Gate wastewater treatment plants)

Although the 5Rs hierarchy used for solid waste does not apply precisely to liquid waste, the basic components of Reduce, Recover (including water 'reuse'), and Residuals management do apply, along with Treatment and Discharge.

Liquid waste is mostly water that is contaminated by only a small amount of waste (less than 1/20 of 1% from homes and businesses). The water in liquid waste comes from homes and businesses from the drinking water used in plumbing fixtures such as sinks, toilets and bathtubs. It also comes unintentionally from rainfall and groundwater that enters through leaky sewer pipes. While the oldest sewers intentionally include rainwater from street drains and house drains, these combined systems are being separated as part of long-term sewer replacement programs.

In general, the amount of wastewater is predicted to rise with population, but reductions in overall wastewater amounts are possible by using less water indoors, and most importantly, repairing leaky sewers to prevent rainwater and groundwater from entering the liquid waste system.

Liquid waste is also a resource from which materials, water, and energy can be recovered, particularly at the wastewater treatment stage. With an aggressive program of reduction, recovery, and treatment, only an insignificant portion of the original liquid waste remains as an unusable residual.

2. Liquid Waste Reduction

2.1 Improving the Sewer Use Bylaw

Sewer Use Bylaw No. 299 is used by Metro Vancouver to regulate discharges into the regional sewer system. The bylaw helps protect the environment, human health and safety; protect sewage facilities from damage and promote their efficient and cost-effective operation; and assist Metro Vancouver in compliance with laws and regulations.

New regulatory tools such as Codes-of-Practice and Pollution Prevention Planning could be used to better regulate municipal wastes that wastewater treatment plants cannot easily remove such as certain pollutants from drycleaners, medical and chemical laboratories, building heat and cooling systems, and new contaminants of emerging concern.

An effective bylaw requires ongoing commitment of resources to its regulation and enforcement.

Table 1: Strengthening source controls—what more is needed? – Decision Point

Action	*Level of Commitment*
Commit to stronger enforcement of the bylaw	• Metro Vancouver provides additional resources to enforce bylaw
Develop new regulatory tools aimed at pollutants that cannot be removed at wastewater treatment plants	• Metro Vancouver to develop new codes of practice for targeted industries and priority contaminants of concern
Revise regulatory economic instruments to effectively reduce contaminants and flow at source	• Metro Vancouver to work with the Province to amend *Environmental Management Act*
Improve outreach programs to target reduction of contaminants and flow at source	• Metro Vancouver to update and expand liquid waste outreach programs

2.2 Reducing the Amount of Liquid Waste

Wastewater is mostly water, with less than 0.05% being solids. The water portion is a mixture of tap-water, rainwater, or groundwater. Keeping rainwater and groundwater out of the sewers, and using water more efficiently indoors extends capacity of existing pipes and treatment plants, lowers the risk of sewer overflows during storms and reduces the energy costs to pump and treat wastewater.

The impact of the Drinking Water Management Plan's conservation measures

For every 10% reduction in indoor water consumption, wastewater amounts and associated pumping and treatment energy costs are reduced by 6%. Initiatives in the Drinking Water Management Plan along with recent changes to the BC Plumbing code requiring low-flush toilets in new-plumbing are anticipated to reduce residential indoor water consumption in the region by about 5% over the next 20 years. Further reductions are possible through widespread use of new water saving appliances and fixtures.

Reducing sewage volumes with sewer maintenance

Much of the existing sanitary sewer pipe in the region is now sixty years old—it dates from the major infrastructure expansion that started in the late 1940s. As sewers age, the pipes degrade and become prone to leaks—seals on the joints between pipe sections become leaky—allowing groundwater to flow in.

Groundwater infiltration fills up sewer capacity and can eventually lead to sewer overflows—annually, about 40% of wastewater is due to infiltration from leaky pipes. The only sustainable solution is routine sewer inspection, repair and replacement programs.

However, this presents several challenges as the extent of sewer pipe is in the region is vast and has three levels of ownership.

Metro Vancouver owns 470 kilometres of sewers, and member municipalities own approximately 6400 kilometres of sewers. But the majority of the often older and leakiest pipe is owned privately—8500 km of connections from houses and businesses to municipal sewers.

As part of their programs to reduce the amount of groundwater in liquid waste, Metro Vancouver and municipalities have committed to ongoing programs to inspect the condition of their sewers on a 20 year reoccurring cycle and established a limit for acceptable groundwater infiltration. In addition, municipalities have also committed to developing strategies to manage infiltration from private sewers, including obtaining any necessary legislation to do so. Between 30% and 80% of all groundwater infiltration can be traced to private sewers. However, the effort and budget allocated to these efforts vary between jurisdictions with infiltration continuing to exceed the acceptable limit in most cases.

The current formula to allocate the costs of Metro Vancouver's Sewerage and Drainage District budget to municipalities does not take groundwater infiltration into account. The result is that the extra costs to convey and treat excessive groundwater from a municipality with a leaky sewer system are presently shared by all municipalities.

Table 2: Improving sewer asset management: Metro Vancouver, municipal and private – Decision Point

Action	*Level of Commitment*
Decrease wastewater generation by reducing indoor water use	• Through the actions of the Drinking Water Management Plan continue to decrease indoor water use
Manage the condition of municipal and Metro Vancouver sewers	• Metro Vancouver and municipalities to continue with current levels of sewer inspection and maintenance programs
	• Set minimum rates of sewer inspection and renewal in the Liquid Waste Management Plan
	• Set region-wide standards for sewer inspection and renewal
Manage the condition of private sewers	• Set a deadline in the Liquid Waste Management Plan for municipalities to develop and implement options to repair or replace leaky sewers on private property
Charge municipalities costs of conveying and treating wet weather flows	• Metro Vancouver to develop options for wet weather cost allocation—sewer systems with high levels of groundwater infiltration and rainwater inflow would be charged more to convey and treat excessive wastewater

2.3 Effective municipal stormwater management

Municipalities have a legal mandate to manage drainage and stormwater systems. Stormwater systems are designed to protect property from local rainfall related flooding. Most municipalities have dedicated pipes for stormwater (the exceptions the remaining combined sewers in Burnaby, New Westminster and Vancouver).

Currently, Metro Vancouver facilitates regional stormwater policy development through the Stormwater Inter-agency Liaison Group comprising member municipalities and regulatory agencies. Their work has concluded that if traditional stormwater practices

continue, the current trend of waterway degradation and loss of fish populations will continue. To counter this trend, municipalities have committed to develop by 2014 Integrated Stormwater Management Plans (ISMPs) for each of their watersheds.

Even though progress has been mixed, with some municipalities completing integrated stormwater management plans and others not having started, plan implementation is proving difficult. Key to the plans is a long-term time horizon and the need to manage rainfall at its source—at the building site level. This requires integration of municipal stormwater management with rainfall management at the building level. Such an approach is not part of the traditional administrative structures in most municipalities, yet appears to be the only effective means to enable communities to grow and redevelop while maintaining healthy urban waterways. Because of unfamiliarity with site-level rainwater management techniques new to the Metro Vancouver region and concerns with public and private costs, some municipalities have been reluctant to implement this key strategy in their Integrated Stormwater Management Plans.

Table 3: Adopting new stormwater practices for new developments – Decision Point

Action	*Level of Commitment*
Complete and implement integrated stormwater management plans	• Municipalities continue to develop and complete ISMPs by 2014 • Municipalities to implement actions in ISMPs that call for rainfall management at the building and site level
Link ISMPs to neighbourhood concept plans and site development	• Municipalities formally link their stormwater and land use plans

3. Materials and Energy Recovery

Wastewater contains energy: low-grade heat in the water, greases and fats which can be processed into biodiesel, biogas-methane and biosolids produced during wastewater treatment. Wastewater also contains nutrients—phosphorous in particular is a scarce, non-renewable resource that cannot be substituted and is essential for all life and all agriculture.

3.1 Recovering Nutrients

Metro Vancouver's treatment plants remove nutrients along with other contaminants from wastewater and currently produce nutrient rich biosolids, with the best quality biosolids marketed as Nutrifor™. These may be applied directly to land as a fertilizer, but because of concerns of trace contaminants, an excess supply of nutrients in the Fraser Valley, and market competition from other compost products, demand and market potential for Nutrifor™ is limited.

Phosphorous can now be commercially recovered at treatment plants and marketed to agriculture—researchers developed the process at Metro Vancouver's Tilbury Island Wastewater Treatment Plant.

3.2 Energy recovery opportunities

Wastewater treatment plants and sanitary sewers contain renewable energy, most of which is not presently accessed or is underutilized. The importance of this renewable energy will increase as it can reduce reliance on fossil fuels, cut greenhouse emissions

and increase energy independence. The rationale for accessing and recovering energy from liquid waste will increase as national or provincial renewable energy and greenhouse gas policies are further developed.

Currently, Metro Vancouver is restricted in how it accesses and recovers energy from liquid waste under its existing utility legislation. Metro Vancouver can build systems to recover energy for use within its own water and wastewater utilities, but is currently restricted from being able to build energy recovery projects to generate revenue.

Heat Energy Recovery: Low grade heat in sewers and treated effluent is concentrated and used for space heating and domestic hot water in Sweden, Norway, Germany and Switzerland. These systems range in size from a single building to district heat systems serving tens of thousands of people. While these systems generally have high capital costs, they typically have very low operating costs and can deliver heat with minimal greenhouse gas emissions—they can be used to replace greenhouse gas emitting natural gas heat systems.

The City of Vancouver is presently developing a hybrid district heat system which uses heat energy recovered from its sewers for the new developments occurring in its SE False Creek neighbourhood.

Biogas Production: Wastewater treatment and processing produce biogas which is similar to natural gas except that biogas is renewable. Biogas can be burned for heat and electricity.

At Metro Vancouver's Iona Island and Annacis Island Wastewater Treatment, most of the biogas produced is used to provide process heat and electricity to run the plants. There is more potential for biogas generation and recovery in Metro Vancouver. Wastewater treatment plants can integrate with municipal solid waste management to maximize the production of biogas in bioreactors fed by wastewater treatment solids and municipal organic solid waste. Biogas can be used to generate heat and electricity, used as a vehicle fuel, and used as a substitute for non-renewable natural gas.

Biodiesel Production: Wastewater contains grease and fats from industries, businesses and home-cooking. Grease and fat build-up in sewers reduce conveyance capacity and adds to maintenance expenses. Restaurants and other businesses with high amounts of waste grease and fat have traps to collect the waste grease for trucking to either wastewater treatment plants or rendering facilities. Alternately, waste grease can be processed into biodiesel.

Characterization of Metro Vancouver's sewer grease and trap grease indicates that blending them with other suitable feedstock to make biodiesel is feasible. However, additional feedstock is necessary to make this viable.

Energy from Biosolids: Biosolids which cannot be used as fertilizer can be burned to produce heat and electricity, or used as a supplemental fuel in industrial processes such as cement kilns.

3.3 Water reuse applications

The challenge with water reuse options is that liquid wastes require a high level of treatment prior to reuse. While some reuse systems, such as grey water systems, are

used successfully in limited instances, comprehensive regulations regarding their use have not yet been developed.

Metro Vancouver's wastewater treatment plants do offer opportunity for large scale water reuse as an alternative water source for industrial and irrigation applications. Some water reuse occurs at the Annacis Island wastewater treatment plant to offset the purchase of high quality drinking water, which is not needed for industrial applications.

Water reuse systems have been successful in parts of the world that typically experience higher water rates and less abundant water resources than the Lower Mainland.

Table 4: Recovering materials, water reuse and energy—how much, how soon? – Decision Point

Action	*Level of Commitment*
Recover nutrients from wastewater	• Metro Vancouver to recover phosphorous for fertilizer at its wastewater treatment plants ○ requires investment in components and development of markets
Recover energy for revenue	• Metro Vancouver to seek changes to legislation to enable it to recover energy for revenue
Recover heat from sewers and treated effluent	• Metro Vancouver to develop and implement sewer and effluent heat recovery and use
Enhance the production and use of biogas	• Metro Vancouver to implement options to expand the recovery of biogas for heat and electricity or uses as a fuel at all wastewater treatment plants • Metro Vancouver to explore opportunities to co-manage liquid wastes and organic municipal solic waste in bioreactors to increase biogas production
Biodiesel production from the fats and greases in liquid waste	• Metro Vancouver to explore market requirements and partnership opportunities for the production of biodiesel using the grease and fat currently disposed of as liquid waste as a supplemental feedstock
Expand the reuse of treated wastewater	• Metro Vancouver to expand the reuse of treated wastewater at its existing and new facilities by developing viable industrial, commercial and municipal water reuse opportunities

4. Treatment and Discharge

4.1 Monitoring the waterways

Metro Vancouver monitors the receiving water quality and the environment to understand whether wastewater treatment operations could be causing any long-term environmental impacts. These programs are critical to Metro Vancouver's "cautions, warnings, triggers" approach for liquid waste management – also a core feature in the proposed Canada-wide standards for managing municipal wastewater effluent currently being developed by the Canadian Council of Ministers of the Environment (CCME).

While Metro Vancouver has a good understanding of the performance of its wastewater treatment plants, other environmental discharges such as agricultural runoff, pleasure boats and private septic systems also have an impact on the region's waterways: sources of non-point source pollution either under municipal, provincial or federal responsibility.

All current Metro Vancouver monitoring of non-point source pollution is voluntary or incidental to core work. While Metro Vancouver could develop and undertake programs specifically targeting sources of non-point source pollution, it does not have the legal mandate to manage or regulate non-point source pollution.

4.2 Managing under wet weather conditions

Within Metro Vancouver there are three types of sewer systems: storm sewers for rainfall and runoff; sanitary sewers for residential, commercial and industrial wastes; and combined sewers which convey both sanitary and storm flow in one pipe. Combined sewers were the first sewers built in the region, and are only located in parts of Burnaby, New Westminster and Vancouver. Overflows from combined sewers occur during wet weather. Municipalities are replacing combined sewers with separated systems. Less than 1% of the wastewater in the region is still being discharged from combined sewer overflows.

Combined sewers carry large amounts of rainfall, and when it is raining can overflow at dedicated outfall locations along the Fraser River and Burrard Inlet. Combined sewer overflows contain small percentages of untreated sewage which are mixed with large quantities of rainwater. In the Vancouver Sewerage Area, Burnaby, and Vancouver have committed to eliminating combined sewer overflows by 2050, while in the Fraser Sewerage Area, Burnaby and New Westminster have committed to combined overflow elimination by 2075. Combined sewer overflow elimination is being achieved primarily by the separation of combined sewers into storm and sanitary systems as part of ongoing municipal sewer replacement and renewal programs.

Overflows from sanitary sewers typically occur in wet weather due to large amounts of rainwater inflow and groundwater infiltration entering the sanitary sewers. Ongoing sewer inspection, repair and replacement programs are essential to reducing the likelihood of overflows—for all regional, municipal and private sewers. New storage and wet weather treatment plants may be required as an interim measure until sewer management programs become better developed.

Table 5: Managing liquid waste in combined sewers – Decision Point

Action	*Level of Commitment*
Reaffirm timeline for combined sewer overflow elimination: Vancouver Sewerage Area by 2050 and Fraser Sewerage Area by 2075	• Burnaby, New Westminster and Vancouver to review the current timeline
Charge municipalities for stormwater flows in combined sewer systems	• Metro Vancouver to develop options for wet weather cost allocation for Board consideration

4.3 Timing and sequence for building secondary treatment for Vancouver and North Shore Sewerage Areas

Under the current plan, Metro Vancouver will provide secondary level wastewater treatment for the Vancouver and North Shore sewerage areas by 2020 and 2030 respectively. These sewerage areas are currently served by the Iona Island and Lions Gate wastewater treatment plants.

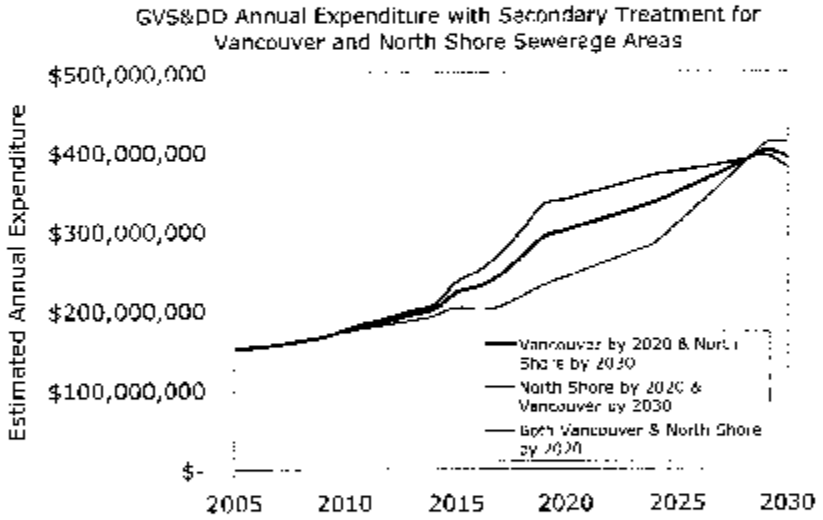
The proposed Canada-wide standards for municipal wastewater effluent will set timelines and performance requirements for secondary treatment. It is expected that the

Canada-wide strategy will give the North Shore greater priority than the Vancouver Sewerage Area based upon the evaluation of the existing plants. This would reverse the sequence for secondary treatment with a North Shore deadline of about 2020 and a Vancouver deadline of 2030.

Timelines to design and construct new or upgraded wastewater treatment plants are approximately 10 years from start to plant commissioning. Designing and building wastewater treatment plants will consume significant financial, technical and construction resources.

Figure 1 shows the cost implications on GVS&DD annual expenditures for these scenarios. The projections are based on expenditures as high as $1 billion for Vancouver Sewerage Area and $400 million for the North Shore Sewerage Area. Figure 1 does not consider potential senior government cost sharing.

Figure 1: Cost Implications of Secondary Treatment Timing Options for Vancouver and North Shore Sewerage Areas



Under Metro Vancouver's current plans, the North Shore Sewerage Area will be served by a new secondary level treatment plant located at the site of the former BC Rail Passenger Station Lands in North Vancouver. The Iona Island Wastewater Treatment Plant has outstanding site issues which require resolution prior to committing to its upgrade.

Planning work for secondary treatment in both sewerage areas will continue in 2008. Consultants are being invited in the first quarter to respond to a request for proposal to help Metro Vancouver develop the project definition reports with input from communities, First Nations and regulatory authorities.

With new plants, there is the opportunity to build sustainable infrastructure by incorporating flexible technologies that can respond to evolving treatment expectations, as well as integrating the new plants with other Metro and municipal planning objectives. New plants could be heat sources for district heating; co-manage municipal organic solid waste in bio-rectors for enhanced biogas production; provide high quality phosphate and nutrient recovery; create reusable water; reduce their greenhouse gas emissions, incorporate a high level of odour control and provide community amenities.

Table 6: The timing and order of providing secondary treatment to Vancouver and North Shore Sewerage Areas – Decision Point

Action	*Level of Commitment*
Upgrade to secondary treatment using current timelines—Vancouver by 2020 and North Shore by 2030	• Metro Vancouver to resolve Vancouver Sewerage Area site issues, complete project definition, and seek senior government cost sharing
Upgrade to secondary treatment to meet new Canada wide standards – North Shore by 2020 and Vancouver by 2030	• Metro Vancouver to complete project definition and seek cost sharing from senior government
Simultaneous upgrade to secondary treatment—North Shore and Vancouver by 2020	• Metro Vancouver to resolve Vancouver Sewerage Area site issues, complete project definitions, and seek cost sharing for both Sewerage Areas

5. Managing Residuals

Sustainable liquid waste management ideally has no residuals—everything is reused, recycled recovered, or safely discharge to receiving waterways.

Currently, liquid waste management produces only a small quantity of residuals, which consist of sewer grit and treatment screenings. About 19 truck-loads per week of these materials are disposed of at a landfill or the waste-to-energy facility. Currently, these residuals have no beneficial reuse applications.