Summary Report

Associated Engineering

GLOBAL PERSPECTIVE. LOCAL FOCUS.

District of Sooke

Stage 3
Liquid Waste Management Plan (Sanitary)

April 2010

ASSOCIATED ENGINEERING

QUALITY MANAGEMENT SIGN-OFF

Signature .....

Date May 6, 2010

01-10-013

Executive Summary

The District of Sooke (the District) is situated on the southern coast of Vancouver Island along the shores of Sooke Harbour and Sooke Basin. Among a backdrop of forests, mountains, and rugged shorelines, the District is located approximately 38 km southwest of downtown Victoria. The climate of the region is typical of the west coast with warm, dry summer months and wet, mild winter months when most of the annual precipitation for the District occurs. The Sooke River flows to Sooke Harbour directly north of Whiffin Spit, an expanse of land that extends into the ocean providing a division between the Harbour and the Strait of Juan de Fuca. The T'Sou-ke Nation also make their home along the shoreline of Sooke River and Sooke Basin. The community of Sooke is approximately 10,227 ha classified as rural to semi-rural. An aerial view of the District is presented in **Figure 1** in the main report which follows.

Industries of the District were traditionally based on natural resources, including logging and fishing. Today, tourism is emerging as an important sector of the economy for the District. Businesses in the community include restaurants, two grocery stores, pharmacies, hardware, store, two strip malls, a number of bed and breakfasts, cabins and vacation rental homes, banks, dentists, and doctors. The community of Sooke was incorporated as the District of Sooke on December 1999. The District provides a number of amenities to residents and visitors including a golf course, Whiffin Spit Park, Sooke Potholes Provincial Park, skateboard park, arena and aquatic centre, museum, and visitor information centre, and the Sooke Philharmonic. The population of Sooke is about 9,705, with 3,855 private dwellings in the community, according to Statistics Canada 2006 census data. This population has increased since the implementation of the sewer system.

Recognizing the significance of environmental protection of the region, the District has taken a proactive approach to wastewater and rainwater management. As outlined in the District's Official Community Plan, this approach supports the District's goals of environmental remediation and protection of the aquatic habitats of Sooke Harbour and Basin from leaking septic systems and rainwater-related pollution. These changes will improve water quality and help to revitalize shellfish harvesting in Sooke Harbour and Basin by the T'Sou-ke Nation. Actions such as implementing sewering of the District core area and providing secondary wastewater treatment, putting into action a source control bylaw, performing activities that will minimize infiltration and inflow (I&I) into the sewer system, and completion of the sanitary and rainwater liquid waste management plans (LWMPs) to demonstrate the District's commitment to sustainable management of its liquid waste.

A typical LWMP is undertaken in three stages. The District has previously completed Stages 1 and 2 of the sanitary wastewater portion of the LWMP and Stage 1 of the rainwater portion of the LWMP. Stage 1 of the sanitary portion involved a series of studies concerning solutions to the District's wastewater issues, primarily related to problems and limitations resulting from reliance on septic tank systems as well as the District's higher density "Urban Containment Area" and the Downtown "Core Area". Stage 1 of the sanitary portion of the LWMP resulted in a $22 million project to sewer the Core Area and provide secondary wastewater treatment to the sewered area. Stage 2 of the sanitary portion of the LWMP evaluated

questions related to wastewater management options for the District for the areas that are currently outside of the Sewer Specified Area (SSA). Stage 3 of the sanitary portion of the LWMP, has used the information developed in both Stage 1 and Stage 2 to help refine sanitary wastewater management options and costs and to develop an implementation plan for the sanitary wastewater portion of the LWMP.

The District completed its Stage 2 LWMP (Sanitary) in October 2005. The Stage 2 LWMP (Sanitary) was approved by the MoE in December 2007. Tasks for the current Stage 3 LWMP (Sanitary) work were based on recommendations made by the MoE upon approval of the District's Stage 2 LWMP (Sanitary). Based on the MoE's recommendation, the Stage 3 tasks for this sanitary wastewater-related work included the following:

1. Assist with the re-establishment of the Public and Technical Advisory Committees (PAC and TAC).
2. Establish new LWMP area boundaries and planning horizon.
3. Meeting with TAC and PAC members to review the Stage 2 plan document and Stage 3 tasks.
4. Investigation of remaining treatment plant capacity and the possibility of extending the sewer area.
5. Reconsidering the effluent standard requirements for cluster and/or satellite developments.
6. Investigation of how future development adjacent to Sooke Basin will be serviced.
7. Meetings with TAC and PAC to discuss the results of Tasks 4, 5 and 6.
8. Development of a time table and budget to complete the on-going Rainwater Management Plan.
9. Consideration of an on-site septic system management system through a servicing bylaw.
10. Investigate beneficial reuse opportunities for septage solids and wastewater treatment sludges.
11. Meetings with TAC and PAC to discuss the results of Tasks 8, 9 and 10.
12. Development of terms of reference and a commitment to establish an on-going plan monitoring committee.
13. Development of draft Operational Certificates for existing treatment plant(s) and/or setting registration standards.
14. Identification of the cost per user for users in both the sewered and non-sewered areas.
15. Development of an implementation plan for the intended commitments in the Plan.
16. Meetings with TAC and PAC to discuss the results of Tasks 12, 13, 14 and 15.
17. Development of Draft Bylaws needed to implement the Plan.
18. Development of the Draft Stage 3 LWMP report.
19. Meeting with TAC and PAC to discuss Draft report.
20. Presentation to the District Council.
21. Stage 3 LWMP Public Information Meeting.
22. Finalization of the Stage 3 LWMP report.

Based on the work presented in the attached Stage 3 LWMP (Sanitary) Summary Report, the following commitments are recommended for the District:

- The District commits to maintaining user payment policies/bylaws that ensure new users, either through in-fill or SSA expansion, pay an equitable portion of capital and operating costs while ensuring that existing users continue to pay their fair share.

- The District commits to developing and implementing a bylaw prohibiting direct discharges from satellite treatment plants to Sooke Harbour or Sooke Basin.

- The District commits to maintaining set protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside of the Sewer Specified Area (SSA). This systematic approach will provide a consistent framework for the District to approve or reject a proposal or negotiate a variation on the proposal they have been given.

- The District commits to complete and implement a LWMP (Rainwater) that is consistent with guiding principles for stormwater and rainwater planning and meets the guidelines of the MoE.

- The District commits to implementing a regulated maintenance program for private on-site septic systems within the District, which could include development of a public education program and inventory of existing septic systems within the District. The approach could also include identification and monitoring of water quality "hotspots" within the district. After three years, review the impact of the public education program on water quality "hotspots". At which time, the option to develop a bylaw regulating maintenance of on-site septic systems could be put forward.

- The District develops a biosolids management program for beneficial reuse of septic tank and wastewater treatment plant biosolids. Options recommended for the District's biosolids management program include composting of biosolids at an existing or new facility and/or land application of biosolids for use in reforestation situations.

- The District commits to confirming the preferred order of catchment areas to be included in the SSA in the future. The preferred order of catchment areas could vary based on available economic information, on-going environmental monitoring activities, and the priorities of the District.

The District of Sooke LWMP document is broken into 3 parts: A summary of both the LWMP (Sanitary) and the LWMP (Rainwater) and then detailed sections for both the Stage 3 LWMP (Sanitary) and Stages 2 and 3 LWMP (Rainwater). The following is the Summary of the LWMP (Sanitary) and its components.

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1 Introduction

1.1 COMMUNITY OVERVIEW

The District of Sooke (the District) is situated on the southern coast of Vancouver Island along the shores of Sooke Harbour and Sooke Basin. Among a backdrop of forests, mountains, and rugged shorelines, the District is located approximately 38 km southwest of Victoria. The climate of the region is typical of the west coast with warm, dry summer months and wet, mild winter months when most of the annual precipitation for the District occurs. The Sooke River flows to Sooke Harbour directly north of Whiffin Spit, an expanse of land that extends into the ocean providing a division between the Harbour and the Strait of Juan de Fuca. The T'Sou-ke Nation also make their home along the shoreline of Sooke River and Sooke Basin. The community of Sooke is approximately 10,227 ha classified as rural to semi-rural. An aerial view of the District is presented in **Figure 1**.

Industries of the District were traditionally based on natural resources, including logging and fishing. Today, tourism is emerging an important sector of the economy for the District. Businesses in the community include restaurants, two grocery stores, pharmacies, hardware, store, two strip malls, a number of bed and breakfasts, cabins and vacation rental homes, banks, dentists, and doctors. The community of Sooke was incorporated in December 1999 and provides a number of amenities to residents and visitors including a golf course, Whiffin Spit Park, Sooke Potholes Provincial Park, skateboard park, arena and aquatic centre, museum, and a visitor information centre. The population of Sooke is about 9,705, with 3,855 private dwellings in the community, according to Statistics Canada 2006 census data. This population has increased since the implementation of a sewer system.

Recognizing the significance of environmental protection of the region, the District has taken a proactive approach to waste management. As outlined in the District's Official Community Plan, this approach supports the District's goals of environmental remediation and protection of the aquatic habitats of Sooke Harbour and Basin from leaking septic systems and revitalizing shellfish harvesting in Sooke Harbour and Basin by the T'Sou-ke Nation. Actions such as implementing sewering of the District core area and providing secondary wastewater treatment, putting into action a source control bylaw, performing activities that will minimize infiltration and inflow (I&I) into the sewer system, and near completion of the sanitary and rainwater liquid waste management plans (LWMPs) demonstrate the District's commitment to sustainable management of its liquid waste.

1.2 HISTORY OF THE DISTRICT OF SOOKE'S LIQUID WASTE MANAGEMENT PLAN

In the 1990's, the environmental quality of the waters of Sooke Harbour, Sooke Basin and many of the tributary creeks and ditches in the District was deteriorating. Proof of this was shown in studies completed by the Capital Regional District (CRD) and Vancouver Island Health Authority (VIHA). The problems were due to failing septic systems coupled with poor soil conditions and high groundwater tables. In several cases, this resulted in virtually raw sewage running in the ditches that ultimately discharged into the Sooke River, Sooke Harbour and/or Sooke Basin or their tributaries. Several engineering studies in the late

INSET - Sooke Potholes

0 500 1,000

Metres

Sooke River

T' Sou-ke 1

Sooke Basin

Sooke Harbour

T' Sou-ke 2

Juan de Fuca Strait

Legend

Sooke Municipal Boundary

2007 & 2009 Orthophoto

District of Sooke

N

0 1,500 3,000

Metres

Figure 1
Aerial View of the District of Sooke

1990's and early 2000's focussed on sewering a "Core Area" in which the majority of the septic tank failure and groundwater problems existed. This ultimately resulted in a $22 million program to sewer the Core Area and some additional areas and to provide secondary wastewater treatment for the collected sanitary wastewater. Approximately $17 million of this project was submitted for a Federal/Provincial infrastructure grant. One of the conditions of the subsequent grant approval process was that the District had to complete a LWMP for both the sanitary wastewater and the stormwater (now re-termed Rainwater) in the community.

LWMPs are typically developed in a three stage process. Stage 1 is typically used to determine what the problems are and what the ranges of options to solve the problems are. Stage 2 is used to further refine and evaluate these solutions and select a list of options for implementation. Stage 3 is used to develop the details related to the implementation of the LWMP. In the case of the District, the previous non-LWMP Core Area studies had virtually completed a Stage 3 for the Core Area but had not looked in detail at the areas outside of the Core Area. As a result, it was decided that the previous studies would be deemed to be equivalent to Stage 1 and that Stage 2 would focus on the areas outside of the Core Area or, as it came to be known, the Sewer Specified Area (SSA). Stage 2 looked at issues such as appropriate lot sizes for on-site treatment under various soil conditions, on-site treatment options, and mapping of soils suitability for on-site treatment. Technical and public advisory committees (TAC and PAC) provided review of the Stage 2 technical memoranda. The Stage 2 results were presented to the public at open house meetings. Subsequently, a separate process was started to develop a LWMP for stormwater or, as it came to be known, the LWMP (Rainwater).

The District completed and submitted its Stage 2 LWMP (Sanitary) in October 2005. The Stage 2 LWMP (Sanitary) was approved by the MoE in December 2007. Tasks for the current Stage 3 LWMP (Sanitary) work were based on recommendations made by the MoE for approval of the Stage 2 LWMP. These tasks are discussed in Section 2.

The LWMP (Rainwater) began in 2006. Stage 1 of the LWMP (Rainwater) was completed in 2007, and approved in February, 2008. In an attempt to complete the LWMP (Rainwater) at the same time as the LWMP (Sanitary), Stages 2 and 3 of the LWMP (Rainwater) have been conducted at the same time. Both the Stage 3 LWMP (Sanitary) (documented herein) and the Stages 2 and 3 LWMP (Rainwater) have now been completed.

1.3 WASTEWATER TREATMENT

Prior to implementing the District's Core Area wastewater management project, the District was serviced by more than 1,000 on-site septic systems. Many of these systems were old and leaking. In combination with high groundwater tables and poor soil conditions, this leakage resulted in the seepage of wastewater effluent into Sooke Harbour and Basin and impacts to the surrounding marine environment. This lead to studies regarding the sewering of the "Core Area" in the District, where most of the problematic septic systems were located.

Construction of the sewer system and wastewater treatment plant for the District's Core Area began in 2004 and was commissioned in November 2006. This Core Area sewer system became known as the Sewer Specified Area or SSA. Individual and domestic sewer system hook ups within the SSA were added between January 2006 and August 2007. The sewer system consists of 4 pump stations located at Sooke Road, West Coast Road, Helgesen Road, and the Phillips Road subdivision and approximately 27 km of piping (exclusive of the Phillips Road subdivision addition). The Core Area sewer system services approximately 5,500 residents.

Collected sanitary wastewater is treated at the Sooke Wastewater Treatment Plant, located off West Coast Road. The 3 mega litre per day (MLD) facility is a secondary wastewater treatment facility consisting of a sequencing batch reactor (SBR) followed by ultraviolet (UV) disinfection. The design of the headworks of the facility allows for expansion of the hydraulic capacity of the treatment plant up to 6 MLD. Treated effluent is discharged via a 1.7 km long, 30 m deep marine outfall to Sooke Bay and the Strait of Juan de Fuca. After the completion of Stage 2 of the LWMP (Sanitary), this facility was developed under a British Columbia Municipal Sewage Regulation (MSR) registration as a secondary treatment plant. This included environmental impact assessments of the discharge of secondary effluent and the construction of the treatment plant and the outfall.

The District is committed to continue to provide a minimum of secondary treatment for all the wastewater that is collected in its sewer system. As outlined in the draft Operational Certificate (OC) in **Appendix L**, this currently means never exceeding 45 mg/L biochemical oxygen demand (BOD) and 45 mg/L total suspended solids (TSS) as per the British Columbia Municipal Sewage Regulation (MSR). Changes to these values would be done in discussion and consultation with the Ministry of Environment (MoE), but would not be revised upwards. If and when it is appropriate, the OC might be amended in the future to comply with changes to the MSR that might result from the Canadian Council of Ministers of the Environment (CCME) Municipal Effluent Harmonization initiative. Such changes could potentially include complying with a 25 mg/L 30 day running-average BOD rather than a 45 mg/L maximum BOD. TSS would be similar with a 25 mg/L running average. However, at this point in time, the BC MSR governs the effluent requirements and the District, through its wastewater treatment plant operations contractor, is committed to meeting the MSR secondary treatment requirements.

The remainder of the District that is not connected to the SSA is serviced by on-site systems ranging from individual on-site septic systems to strata-owned septic systems smaller than 22.7 m^3/day to strata-owned secondary treatment systems treating less than 22.7 m^3/day. In these cases, with flows under 22.7 m^3/day, new systems would be installed under the guidance of a registered professional with registration under the Public Health Act - Sewerage System Regulation, B.C. Reg. 326/2004

Individual developments larger than 22.7 m^3/day wastewater flow, not connected to the sewer system, would have to be registered under the MSR and would likely be based on mechanical-biological treatment. In such cases, the effluent quality would again have to meet MSR secondary treatment standards. Under this LWMP, no direct discharges from such treatment facilities will be permitted to Sooke Harbour or Sooke Basin or any of the streams or rivers flowing into these water bodies. Discharge to ground will be permitted provided the effluent quality is a minimum of at least MSR secondary. Discharge to Sooke Bay would also

be acceptable provided the quality is at least MSR secondary and the outfall is properly designed and the environmental impacts of the outfall are assessed and properly mitigated to the requirements of the Federal Department of Fisheries and Oceans.

1.4 SOURCE CONTROL

Wastewater collection systems and wastewater treatment plants need to be protected from abuse and dangerous situations arising from potentially hazardous discharges to sewer. Typically, this is done through the development of a source control bylaw that limits the discharge concentrations of certain parameters and/or prohibits the discharge of certain wastes or wastes of certain pH or temperature. The District has such a bylaw, Bylaw 224 *Sewer Use Bylaw, 2005*, a bylaw that regulates the discharge of waste into the sewers and wastewater treatment plant operated by the District.

This seventy-six page bylaw covers prohibited wastes in Schedule A of Bylaw 224. This list includes the following wastes:

- Hazardous Waste
- Air Contaminant Waste
- Flammable or Explosive Waste
- Obstructive Waste
- Corrosive Waste
- High Temperature Waste
- Biomedical Waste
- Miscellaneous Wastes

In the latter case, miscellaneous includes any waste, other than sanitary waste, which by itself or in combination with another substance:

- constitutes or may constitute a significant health or safety hazard to any person;
- may interfere with any sewer or sewage treatment process;
- may cause a discharge from a sewage facility to contravene any requirements by or under any B.C. Environmental Management Discharge Permit or any other act, approved Liquid Waste Management Plan, or any other law or regulation governing the quality of the discharge, or may cause the discharge to result in a hazard to people, animals, property or vegetation;
- may cause biosolids to fail criteria for beneficial land application in British Columbia as set out in the Organic Matter Recycling Regulation (British Columbia) deposited February 2002, or may cause the emissions from a wastewater sludge combustion facility to be out of compliance with appropriate permits, or may cause the ashes from a wastewater sludge combustion facility to be considered a special waste under the Environmental Management Act (British Columbia).

Schedule B of Bylaw 224 deals with restricted wastes. These include setting specific limits on conventional parameters including:

- Biochemical Oxygen Demand (BOD) – less than 500 mg/L
- Chemical Oxygen Demand (COD) – less than 1000 mg/L
- Total Oil and Grease - less than 100 mg/L (including no more than 15 mg/L hydrocarbons)
- Suspended Solids – less than 350 mg/L

There is also specific mention in Bylaw 224 of restrictions on the following:

- Food Waste
- Radioactive Waste
- pH of the Waste
- Dyes and Colouring Material

Bylaw 224 outlines the fines for offenses as well as the procedures to obtain a waste discharge permit or authorization to allow a high volume discharge or to allow the discharge of waste other than domestic sewage upon such terms and conditions as the Municipal Engineer considers appropriate for the protection of sewers, sewage facilities, human or animal health and safety, and the environment.

By having and enforcing such a bylaw, the District will be able to protect its sewer system and wastewater treatment plant from abuse, damage, and failure to comply with the Operational Certificate (OC) in the future. This bylaw will be updated and amended from time to time as required in the future.

1.5 INFLOW AND INFILTRATION (I&I)

Rainwater inflow and groundwater infiltration (I&I) enters the sewer system through unauthorized connections or cracks in the pipes or manholes. During wet weather events, this water enters the wastewater collection system and decreases the capacity of the sewer system to convey wastewater and adds to the overall collection volume needing treatment at the wastewater treatment plant. As a result, minimization of I&I is the goal of the District and its sewer system and treatment plant operator.

All reasonable efforts will be made to seek out and remedy problems with the sewer system that allow excessive I&I to enter. Particular efforts will be made to limit I&I at manholes and service connections, including service connections installed in anticipation of future home or apartment construction. Connection of roof leaders and foundation drains will be investigated in problem areas, as required. A forth-coming update to the *Subdivision and Development Bylaw*, *Bylaw 65*, will prohibit the connection of roof leaders to the sanitary sewers. Should this practice be found to be too prevalent, *Bylaw 224 Sewer Use Bylaw*, will be amended to prohibit the connection of roof leaders or foundation drains to the sanitary sewer system.

As the sewer system ages, consideration will be given to remediating any I&I that is identified to come in through pipe joints.

1.6 WATER CONSERVATION AND REUSE

Water conservation and reuse were discussed in Stage 2 of the LWMP (Sanitary). At that time, the wastewater collection system and the treatment plant were not yet constructed. It was anticipated that the per capita wastewater flows would be in the 300 L per capita range, a value that is already considerably lower than many BC communities. The possibility of effluent reuse was discussed but it was concluded that the opportunities would likely be limited.

Since completion of the wastewater collection system and the treatment plant, it has been possible to measure the flows to the treatment plant, and by interpolation, the per capital rate of discharge. The results show that the per capita wastewater flow is in the 250 L to 270 L per capita range, even lower than originally anticipated. As a result, the likelihood of achieving further decreases through water conservation will be limited. Nevertheless, the District will, through its public education programs, encourage water conservation measures such as low flow fixtures and toilets.

2 Stage 3 LWMP (Sanitary) Tasks

At the time of the Stage 2 LWMP (Sanitary) approval in December, 2007, several suggested tasks were defined by the MoE for completion as part of the Stage 3 LWMP (Sanitary) document. These tasks were incorporated into the overall Stage 3 (Sanitary) task list. The Stage 3 LWMP (Sanitary) tasks included the following:

1. Assist with the re-establishment of the public and technical advisory committees (PAC and TAC).
2. Establish new LWMP area boundaries and planning horizon.
3. Meeting with TAC and PAC members to review the Stage 2 plan document and Stage 3 tasks.
4. Investigation of remaining treatment plant capacity and the possibility of extending the sewer specifed area.
5. Reconsidering the effluent standard requirements for cluster and/or satellite developments.
6. Investigation of how future development adjacent to Sooke Basin will be serviced.
7. Meetings with TAC and PAC to discuss the results of Tasks 4, 5 and 6.
8. Development of a time table and budget to complete the on-going Stormwater Management Plan.
9. Consideration of an on-site septic system management system through a servicing bylaw.
10. Investigate beneficial reuse opportunities for septage solids and wastewater treatment sludges.
11. Meetings with TAC and PAC to discuss the results of Tasks 8, 9 and 10.
12. Development of terms of reference and a commitment to establish an on-going plan monitoring committee.
13. Development of draft Operational Certificates for existing treatment plant(s) and/or setting registration standards.
14. Identification of the cost per user for users in both the sewered and non-sewered areas.
15. Development of an implementation plan for the intended commitments in the Plan.
16. Meetings with TAC and PAC to discuss the results of Tasks 12, 13, 14 and 15.
17. Development of Draft Bylaws needed to implement the Plan.
18. Development of the Draft Stage 3 LWMP report.
19. Meeting with TAC and PAC to discuss Draft report.
20. Presentation to the District Council.
21. Stage 3 LWMP Public Information Meeting.
22. Finalization of the Stage 3 LWMP report.

Many of the above tasks were completed through the development and presentation of discussion papers to the PAC and TAC. Summaries of these discussion papers are presented in Section 3.

3 Summary of Stage 3 (Sanitary) Discussion Papers

As part of the Stage 3 LWMP (Sanitary) work, seven discussion papers were prepared. Summaries of the discussion papers are presented in the following sections. Complete discussion papers are appended to this report.

3.1 Discussion Paper No. 1 – Considerations for Adding New Sewered Areas to the District of Sooke Sewer Specified Area

This discussion paper examined payment options for expansion of the SSA. The costs for expanding the SSA were investigated using data developed during a sewer modeling study conducted by Stantec Ltd.

The District needed to investigate the possibility of adding new sewered areas to its SSA sewer and wastewater treatment system. In this consideration, it was necessary to discuss at least two different scenarios, i.e. 1) when the treatment plant has sufficient available capacity and 2) when the treatment plant clearly does not have sufficient available capacity. On top of this, there were also two scenarios for the sewer system, i.e. 1) when the pipes have sufficient capacity and 2) when the pipes clearly do not have sufficient capacity. The issues centre on paying for new capacity and paying a fair share for at least part of the existing capacity.

Regardless of the payment approach selected, the guiding principle would have to be that the existing SSA users continue to pay their fair share and that new users, either through in-fill or SSA expansion, pay an equitable portion of capital and operating costs. In doing so, there may be situations where there is new excess capacity that would have to be covered by the District and then "sold" later via latecomers fees to subsequent additions to the SSA.

The original SSA was based on four catchment areas - Sooke Road Lift Station, West Coast Road Lift Station, Helgesen Road Lift Station and a gravity catchment that flows to the wastewater treatment plant without the use of a lift station (pumps). **Table 1** presents the findings of an economic examination of the potential to expand the SSA, by catchment area.

Based on the results of the economic analysis, it would appear that there are three candidate area groups, with decreasing feasibility, for any SSA expansion. The area that appears to be most economically feasible to include in an expanded SSA is the Foreman Heights catchment area. A group of areas with medium economic feasibility, which include Erinan, Whiffin Spit North, and the four catchments to the east, likely taken as a whole or phased in the following order: Kaltasin, Saseenos, Goodridge, and Grouse Nest. The group of areas that have low economic feasibility, such as West Coast Road and catchments to the south including Whiffin Spit West and Whiffin Spit South. Whiffin Spit South is prohibitively high in cost per new SFE for SSA expansion at this time; however, should the District decide to implement sewering of the entire Whiffin Spit catchment area, one option to consider is cost-sharing of infrastructure among all new Whiffin Spit SFEs, which would equalize the overall expansion costs for the area.

A copy of Discussion Paper No. 1 is presented in **Appendix A**.

Commitment

The District commits to maintaining user payment policies/bylaws that ensure new users, either through in-fill or SSA expansion, pay an equitable portion of capital and operating costs while ensuring that existing users continue to pay their fair share.

3.2 Discussion Paper No. 2 – Satellite Treatment Plant Effluent Standards

This discussion paper examined options to maintain the requirement for the reclaimed water quality standard or allow a lower standard, i.e. the normal secondary treatment standard, for satellite treatment plant effluent standards.

A satellite wastewater treatment plant is a plant that services an area that has a sewer system that is not connected to the main sewer specified area. As such, the treatment plant has to be able to accept and treat all the wastewater that is directed to it and has to meet an agreed-to minimum effluent quality standard. As part of the Stage 2 LWMP final report, it was recommended that satellite treatment plants be allowed within the District, but only if the treatment standard was that for reclaimed water use under the Municipal Sewage Regulation (MSR). Based on the MSR, the effluent would be suitable for a wide variety of reuse options, but could also be discharged to a surface water without any dilution, i.e. it could be used for stream augmentation. When the MoE reviewed the Stage 2 LWMP prior to its approval, they noted correctly to the District that meeting the reclaimed water standard was very onerous in terms of redundancy and monitoring requirements. On this basis, the MoE suggested that the District might want to revisit the requirement for this standard.

Requiring that the effluent meet reclaimed water quality standards would help to avoid the need for outfalls but it would not negate the need for phosphorus removal if the discharge ended up in Sooke Harbour or Basin. Discharging reclaimed water quality effluent into small creeks as stream augmentation raises the possibility of potential impacts from endocrine disrupting chemicals (EDCs) on fish resident in those creeks. This would require additional treatment such as advanced oxidation or a constructed wetland prior to discharge to the creeks. In all cases, requiring reclaimed water quality effluent would mean that the treatment plant have a high level of redundancy and monitoring that will further increase the cost of an already more expensive treatment process.

The other alternative of permitting satellite plants to meet secondary treatment standards would require that the effluent be discharged via outfalls. While this helps to get around the potential problems with discharging to creeks and streams, it does open up other issues, i.e. construction and operation of outfalls, impacts on Sooke Basin and Harbour, e.g. fecal coliforms, dissolved oxygen, nutrient removal, etc. One potential solution would be to require that any satellite treatment plants discharging secondary treatment effluent only be allowed to discharge to open marine waters of Sooke Bay. This would require a relatively long and costly outfall raising the capital and operating costs of the treatment system.

Based on the above, the recommendation was to stay with the reclaimed water quality standard for effluents from satellite treatment plants and add phosphorus removal and, potentially, advanced oxidation or a constructed wetland before discharge to the creeks or streams. Discussions at the advisory committee level indicated that there should be no discharges to Sooke Harbour or Basin and the discharges should be to ground or via open marine outfall. Connection to the existing SSA could be allowed, but only on a "user-pay" basis.

A copy of Discussion Paper No. 2 is presented in **Appendix B**.

Commitment

The District commit to implementing a bylaw prohibiting direct discharges from satellite treatment plants to Sooke Harbour or Sooke Basin or any of their tributaries.

The following options are recommended for the District for disposal of satellite treatment plant effluent:

- Open marine outfall to Sooke Bay,
- Approved discharge to ground, or
- Connection to sewer system using a "user-pay" basis.

A draft example discharge control bylaw is presented in **Appendix H**.

3.3 Discussion Paper No. 3 – Treatment Options for Areas Around Sooke Basin and Harbour

This discussion paper examined three treatment options for wastewater for new developments outside the District's SSA.

The District's SSA serves a large majority of the residential, commercial and institutional core of the District. Areas outside of the SSA currently remain on some form of on-site treatment with ground disposal, including Type 1 conventional septic tank systems and Type 2 packaged wastewater treatment systems with ground disposal. For new approved developments within the SSA, there is no need for on-site treatment, just an approved connection to the SSA and the treatment plant, with fees paid for hook-up and on-going costs, as required. Outside the SSA, new developments have three main options for wastewater treatment - expansion of the SSA to include the area in question, satellite treatment and appropriate disposal, and on-site treatment and disposal.

Expansion of the SSA to include the area in question is a potential strategy for wastewater management for developments outside of the SSA. Technically, it is possible to expand the SSA by adding the required sewers and pump stations, and increasing the capacity of the wastewater treatment plant. However, as was shown in Discussion Paper No. 1 "Considerations for Adding New Sewered Areas to the District of Sooke Sewer Specified Area", the cost of expanding the SSA varies from area to area, with some areas being less expensive to add and other areas being much more expensive to add. Using this approach, it

would be possible to have a developer-instigated and paid-for connection to the SSA, with all the required piping, pump stations, and treatment plant upgrades required to service the new area be paid for by the developer. Adding additional capacity for future developments at the same time would likely be a wise long term decision. Deciding who should pay for this additional extra capacity, the developer and/or the District, would be a subject of negotiations between the District and the developer.

Satellite treatment and appropriate disposal is another strategy for wastewater management outside the SSA. Discussion Paper No. 2 (DP2) "Satellite Treatment Plant Effluent Standards", discussed satellite treatment in the context of what effluent standards should be required and the interaction between the effluent standards and the disposal point, i.e. stream augmentation or outfalls to Sooke Harbour or Basin. DP2 concluded that the original Stage 2 recommendation that the minimum effluent requirement of the MSR reclaimed water quality, including disinfection to protect shellfish harvesting, was appropriate, despite the recognition that additional measures, e.g. advanced oxidation or constructed wetland, and phosphorus removal should also be required. However, satellite treatment and appropriate disposal will not be inexpensive. Any developer considering the need for wastewater treatment would have to include such costs in their business plan development, along with the cost of connecting to the SSA or having on-site systems. Regardless, the consensus of the advisory committee was the following:

1. No discharges to Sooke Harbour or Basin via creeks or outfalls.
2. Approved discharges to ground would be permitted.
3. Discharges via open marine outfalls would be permitted.

On-site treatment is another strategy for wastewater management outside the SSA. Such treatment could be conventional Type 1 septic systems or Type 2 mechanical/biological secondary treatment package plants. Both would discharge to the ground. Treatment systems could be installed by the developer for individual homes or as a cluster treatment system, e.g. 16 homes on a single, larger Type 1 or Type 2 treatment system, with the treatment plant and disposal field on common strata property. For flows below 22.7 m^3/day (approximately 16 single family equivalents (SFEs) or less), administration of the treatment facility would be through a registration under the Health Act's 2005 Sewerage Regulation and its current amendments. For flows more than 22.7 m^3/day, the facility would be registered with the MoE under the 1999 MSR and its current amendments. In all cases, the onus is left with the designer/installer and the owner to continue to meet the respective requirements now and in the future. From a developers view point, on-site treatment might be less costly than the SSA connection option or the satellite treatment option but it will also likely mean that the number of lots that are possible from a given parcel might be lower than with the other options, including connecting to the SSA.

If there are developments outside of the SSA and they involve satellite treatment or cluster treatment systems, the District should have concerns about the long-term viability of these systems and who will inherit the treatment plants and their operation should something go wrong. One possible solution to the problem would be to institute a bylaw under the LWMP that would require developers of cluster systems under the Health Act within the District to post bonds. These bonds would be subsequently signed over to the strata corporation, to be held in trust, for such an eventuality.

Knowing the options presented above, a developer will do their own due diligence and develop costs and projected revenues for various lot size and lot number scenarios under the three different treatment options. Depending on the results, they will make a choice and approach District Council with a development proposal.

A copy of Discussion Paper No. 3 is presented in **Appendix C**.

Commitment

The District maintain set protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside of the SSA. This systematic approach will provide a consistent framework for the District to approve or reject a proposal or negotiate a variation on the proposal they have been given.

A draft example discharge control bylaw is presented in **Appendix H**.

3.4 Discussion Paper No. 4 – Rainwater Management Plan: Scope, Budget and Schedule

This discussion paper outlined the requirements, including terms of reference (ToR), budget and schedule, for the LWMP (Rainwater), with simultaneous preparation with the LWMP for wastewater.

Running in parallel with this LWMP for Wastewater in 2006, the District commenced work on a separate component of the LWMP for Rainwater. The purpose of a LWMP (Rainwater) Stage 1 was to introduce stormwater management issues to the community and provide a realistic set of stormwater management actions considered appropriate for detailed investigation and discussion in the District LWMP (Rainwater) Stage 2. Once the final LWMP (Stormwater) has been approved by the provincial government, it will become a written record of the District's decisions and plans for the management of stormwater and will likely be adopted into the District 's Official Community Plan.

The LWMP (Rainwater), Stage 1 received provincial MoE approval in a letter dated February 7, 2008. The District is now moving forward with the development of a LWMP (Rainwater), Stages 2 and 3. The ToR for this work was prepared to meet provincial expectations for the process, content and delivery of a LWMP (Stormwater), Stages 2 and 3. The Stage 2 and 3 work will develop a LWMP that will focus on rainwater, since it was thought to be more accurate than "stormwater", which is rainfall associated with individual storms rather than the overall more inclusive "rainwater" that includes both rainfall from both storm and non-storm events. The remainder of Discussion Paper No.4 refers to Stage 2 and 3 as LWMP (Rainwater).

The District of Sooke Stage 2 and 3 LWMP (Rainwater) will be consistent with provincial objectives and principles of sustainability. Development of the LWMP (Rainwater) will use the five guiding principles identified in Stormwater Planning: A Guidebook for British Columbia (May 2002). The LWMP (Rainwater) will be developed with significant input from the municipal planning and engineering departments. Development of the Plan will require the consultant to undertake detailed investigations of all 71

recommendations identified in the District LWMP (Rainwater), Stage 1. The ToR for the Stage 2 and 3 LWMP (Rainwater) were included as part of this discussion paper.

Based on the Stage 2 and 3 ToR and tasks required by the MoE for inclusion in the LWMP (Rainwater), it is likely that the Stage 3 LWMP (Wastewater) could be completed before the Stage 2 and 3 LWMP (Rainwater). The budget for completing Stage 2 and 3 LWMP (Rainwater) is approximately, $110,000.

A copy of Discussion Paper No. 4 is presented in **Appendix D**.

Commitment

The District commit to continue with development and implementation of a LWMP (Rainwater) Stage 2 and Stage 3 that is consistent with guiding principles for stormwater planning and meets the guidelines of the MoE.

3.5 Discussion Paper No. 5 – On-site System Management Options

This discussion paper examined two management options for on-site treatment systems, estimated costs associated with the implementation of such programs, as well public education programs for homeowners to assist with care and maintenance for their on-site treatment systems.

All on-site wastewater treatment systems require regular inspection and maintenance to operate effectively. In order to ensure that on-site treatment systems are functioning properly, the District could choose to implement an on-site wastewater treatment system management program, such as Privately-owned and maintained on-site systems and privately-operated inspection program (“Private-Private”) or Privately-owned and maintained on-site systems and publicly-operated inspection program (“Private-Public”).

A Private-Private management program involves renewable operating licences. Under this management program, the District would issue licences upon proof of performance monitoring, pumping, or service by a qualified person. The licence would authorize the owner of the system to use the on-site system for a specified period, as long as the conditions of the licence were met. Owners would pay a fee for the operating licence and would assume all costs associated with pump-outs, repairs, upgrades, or replacement of systems. At the end of the licensing period, the licence may be renewed based on the property owner paying a renewal fee and submitting an inspection report prepared by a qualified person indicating the system is performing properly. Under this management program, the District’s involvement would be enacted under a Regional District bylaw. As part of its LWMP, the CRD opted for the Private-Private on-site system management program for municipalities with septic systems in their Core Area. A bylaw (CRD Bylaw 3479) was enacted to implement the program.

A Private-Public management program differs from the Private-Private program in that the District would provide the systematic inspection and pump-out of on-site systems. These inspections would be conducted by either District staff or an inspection company under contract to the District. System deficiencies would be noted and the property owner would be responsible for hiring a qualified person to complete any

required maintenance or repairs. The property owners would be charged a service fee for the inspection and would assume all costs associated with required repairs, upgrades, or system replacement. A bylaw could be enacted that provides inspectors with the right to access private property for the sole purpose of conducting an inspection of the on-site wastewater treatment system.

Based on analysis of conceptual budgets for each program, the costs of administering the Private-Private and Private-Public management programs are relatively similar, with costs estimated between approximately $25 and $32 per septic system, not including the actual inspection and pump-out costs. When the pump out and inspections are added, the annual cost rises to the $120 and $125 range. For example, the CRD has implemented an annual parcel tax of approximately $25 to $30 that will be charged to owners of on-site sewage systems to administer their Private-Private management program.

The fundamental differences between the Private-Private and Private-Public management programs are the delegation of responsibilities for inspection and maintenance; ownership of the systems (i.e., the property owner or the District); and who employs the on-site system inspector (i.e., the property owner or the District). However, independent of the management program selected, the following are required to ensure the management program is successful:

An education program for on-site system users, i.e., educational pamphlets, advertising, and open houses, inspection and maintenance of on-site systems at regular intervals and a record of each on-site system, in a database, and its condition, pump-out history, etc.

Public education programs have been implemented by jurisdictions, such as the CRD and the Regional District of Nanaimo (RDN), to assist home owners with proper care and maintenance regimes for their on-site treatment systems. The CRD has developed a public education program to supplement their on-site management program. The RDN has opted to not have an on-site system management program and instead will rely on an education program to help ensure proper on-site system operations. Development of the public education program for the CRD (with an estimated 27,000 septic systems), was approximately $50,000. Development of a public education program for the RDN, with an estimated 12,000 septic systems, was approximately $25,000 funded via an increase in septage tipping fees. Costs for implementation of a public education program by the District would be influenced by the extent of the program and the number of homeowners targeted.

A copy of Discussion Paper No. 5 is presented in **Appendix E**.

Commitment

The District commit to the phased implementation of a regulated maintenance program for private on-site septic systems within the District.

The following approach is recommended for the District for a regulated maintenance strategy for private on-site treatment systems:

- Develop and implement a public education program;
- Conduct an inventory of existing septic systems within the District;
- Identify and monitor water quality “hotspots” within the District; and
- After three years, review the impact of the public education program on water quality “hotspots”. At which time, the option to develop a bylaw regulating maintenance of on-site septic systems could be put forward. Example bylaws for the District, modeled after the bylaws for the CRD, are presented in **Appendix H**.

3.6 Discussion Paper No. 6 – Investigation of Beneficial Reuse of Septage and Treatment Plant Biosolids

This discussion paper examined the District’s current practice for management of biosolids and posed three alternative management strategies that could be used for beneficial reuse of biosolids from wastewater treatment processes.

There are two types of wastewater treatment being used in the District area: septic tanks or biological secondary treatment systems. Septic systems only function properly if the septic tank is periodically emptied of its accumulated solids, e.g. once every three to five years. Similarly, a biological secondary wastewater treatment plant only functions properly if biological solids are wasted from the system on a regular basis, i.e. daily. As a result, both types of wastewater treatment that are used in the District create sludges and/or biological solids (biosolids), that need disposal or, if possible, beneficial reuse.

Currently all of the sludges and/or biosolids from the septic systems, Type 2 on-site treatment plants and the District’s wastewater treatment plant all end up at the CRD’s Hartland Avenue landfill. While this is an expedient solution, it does not provide any beneficial reuse except perhaps through the creation of some additional landfill biogas. More direct beneficial reuses include options like land application to forestry lands, composting with chipped land clearing debris and dewatering and drying followed by use as a fuel in a solid fuel boiler.

Organic solids from wastewater treatment, either stabilized aerobically or anaerobically, have characteristics similar to a slow release low strength fertilizer. In addition, because of the relatively fibrous nature of the biosolids, they can be used to add tilth to the soil, i.e. adding microscopic channels between soil particles that allow moisture, air and roots to better penetrate into the soil. As a result, wastewater biosolids can be successfully added to agricultural and forestry soils to improve the growth rate of the crops or trees that are planted or previously have been planted in that soil. There has been some resistance in the CRD towards land application of biosolids. However, in other areas of BC, land application of treated biosolids has been used to beneficially rehabilitate mining sites, including gravel pits. As a result, the potential for land application could be pursued further in the future.

Composting is an aerobic process that mimics what happens naturally to organics, such as leaves or vegetable wastes, if natural processes are left to degrade them over a long period of time. Composting speeds the process up by making sure that the process is kept aerobic (not always true in nature). For treatment plant organic solids (raw sludges or partially digested biosolids), they would be dewatered into

the 20% to 26% dry solids range and then mixed with wood chips or chipped woody debris (e.g. from land clearing or a yard waste chipping program). The woody material is used as a carbon source to help balance the nitrogen and phosphorus in the wastewater solids, as well as to provide and maintain air passages during the composting process. Composting of raw biosolids has been quite successful in BC, as demonstrated by operations by the Comox Valley Pollution Control Centre, and the cities of Penticton, Kelowna, and Vernon. The District could compost its wastewater treatment plant biosolids on its own site (to be determined). However, it is likely better to contract the composting out to an existing or new Vancouver Island-based commercial composting facility such as the Fisher Road composting facility in the Cowichan Valley Regional District.

Wastewater treatment organic solids, either raw undigested or digested biosolids, have a calorific value, i.e. they will burn if they are dry enough. Dried biosolids have a calorific value similar to that of a soft brown coal. Wastewater treatment biosolids are ultimately derived from food, which in turn was derived from atmospheric carbon dioxide either directly (grains, vegetables and fruit) or indirectly (animals or fish). As a result, wastewater treatment biosolids can be considered a renewable fuel source that does not contribute to a carbon footprint when burned. As such, dried biosolids can be used as a coal substitute and should be eligible for greenhouse gas credits. Large treatment plants would produce enough biosolids that major users, such as cement manufacturers, would be interested. At the scale available to the District, the most likely green fuel option would be dewatering and drying the biosolids followed by a solid fuel boiler for steam or heat production.

Based on the above options, the most expedient beneficial reuse options would likely be to truck the dewatered biosolids from the wastewater treatment plant to an existing composting facility or to an approved land application in a reforestation situation.

A copy of Discussion Paper No. 6 is presented in **Appendix F**.

Commitment

The District commits to developing a biosolids management program for beneficial reuse of septic tank and wastewater treatment plant biosolids.

The following options are recommended for the District's biosolids management program:

- Composting of biosolids at an existing facility on Vancouver Island, such as the Fisher Road composting facility in the Cowichan Valley Regional District.
- Land application of biosolids for use in reforestation situations.

3.7 Discussion Paper No. 7 – Priority Assessment for Sewering Catchment Areas in the District of Sooke

This discussion paper assessed methods to prioritize areas for future inclusion in the District's SSA using economics (costs) of sewering catchment areas and level of environmental concern, as represented by surface water fecal coliform concentrations.

During the Stage 3 LWMP process, the District's Stage 3 Advisory Committee noted that there should be some way of developing a prioritized list of areas for future inclusion in the District's SSA. This list was to be based on both economics (cost) and environmental concerns. Since the economics of adding these areas had previously been examined in DP1 "Considerations for Adding New Sewered Areas to the District Sewer Specified Area", the only factor that was missing was a representation of environmental concerns. After determining which type of environmental data might be available, it was decided that surface water fecal coliform concentration data could serve as a surrogate for the level of environmental concern. The implication of using this data is the higher the fecal coliform concentration, the stronger the indication that there were problems with the septic systems in the area. Areas with higher fecal coliform concentrations should be ranked higher on the prioritization list, at least based on potential environmental concerns.

A methodology was developed to score and rank priority catchment areas for sewering based on economics and level of environmental concern. Estimated costs for sewering each catchment area were presented previously in DP1 and **Table 1** in Section 3.1 in this summary document. Environmental concern was selected to be represented by surface water fecal coliform concentration data, as provided by the District. The maximum fecal coliform concentration for each sampling site between 2006 and 2008 within the catchment area was extracted and ultimately averaged. This approach resulted in an average maximum fecal coliform concentration for each catchment area. Different weightings were applied to economic and environmental concern values to develop an overall score. These scores were ranked to determine the catchment areas that would be good candidates for inclusion within the SSA. The results of this analysis are presented in **Table 2**.

Based on the results of the analysis, it is clear that Whiffin Spit North and the Kaltasin catchment areas are good candidates for future inclusion in the SSA. Densification of West Coast Road and Gravity to WWTP catchment areas are also feasible options for the District due in part to the relatively low cost for the addition of new SFEs. Whiffin Spit South catchment area is also a good candidate for inclusion in the SSA by the District. An option for the District is to sewer the entire Whiffin Spit catchment area, including Whiffin Spit North, Whiffin Spit South, and Whiffin Spit West. This approach could permit cost sharing for more equalized costs per new SFE in the Whiffin Spit catchment areas.

Priority catchment areas for sewering and inclusion within the SSA will be subject to change based on available economic information; improvements in environmental information, such as the collection of additional fecal coliform and microbial source-tracking data for catchment areas; and the priorities of the District. At this point, the Kaltasin catchment area, with an estimated cost of about $9200 (2009 dollars) per single family equivalent (SFE) is the most likely candidate for the next expansion of the Sewer Specified Area (SSA).

A copy of Discussion Paper No. 7 is presented in **Appendix G**.

Commitment

The District commits to confirming the preferred order of catchment areas to be included in the SSA in the future. The preferred order of catchment areas could vary based on on-going environmental monitoring activities and the priorities of the District. At this point, the Kaltasin catchment is the most likely candidate for expansion of the SSA.

4 Liquid Waste Management Plan Monitoring Committee

The purpose of the LWMP monitoring committee (the Committee) will be to monitor the progress and success of the implementation of the approved LWMP, for both the Sanitary and Rainwater aspects of the Plan. If the Plan implementation falls behind the approved schedule, the Committee would take steps to determine why the schedule is not being met and what is needed to get the implementation schedule back on track. If the programs that are implemented are not as successful as had been anticipated in the approved LWMP, the Committee would take steps to determine why there are problems and what can be done to mitigate these problems. The Committee will be based on volunteers and will have a very limited budget. The Committee will make recommendations to the District Council. Actions that require significant expenditures will be the responsibility of the Engineering Department, through approval by District Council.

A Draft terms of reference (ToR) was developed for "A permanent Liquid Waste Management Plan Monitoring Committee". The ToR outlined the following:

- Purpose of the committee
- Proposed committee activities
- Make up of the LWMP Plan Committee
- Operation of the committee

The full ToR for the Liquid Waste Management Plan Monitoring Committee is presented in **Appendix I**.

5 Public Consultation

5.1 ADVISORY COMMITTEE MEETINGS

During the Stage 3 LWMP process, meetings were held with the District LWMP (Sanitary), Stage 3 Advisory Committee to present discussion papers and to receive comments and direction from committee members. The membership of the Advisory Committee (Sanitary) included the Ministry of Health (VIHA), the Ministry of Environment, Environment Canada, a District Councillor, District Engineering and Planning department staff, members of the public and First Nations (both T'Sou-ke and Becher Bay were invited to participate and have received all of the documents and meeting minutes during the process).

The first meeting with the Stage 3 Advisory Committee was held on June 26, 2008 at the District's Council Chamber. Discussion of the history of the Sooke LWMP process, including Stage 1 and Stage 2 and an outline of the Stage 3 tasks was presented. The minutes of this meeting are presented in **Appendix J.**

The second meeting with the Stage 3 Advisory Committee was held on September 18, 2008 at the District's Fire Training Room. Discussion Paper No. 1 "Considerations for Adding New Sewered Areas to the District Sewer Specified Area", Discussion Paper No. 2 "Satellite Treatment Plant Effluent Standards" and Discussion Paper No. 3 "Treatment Options for Areas Around Sooke Basin" were presented and discussed. The minutes of this meeting are presented in **Appendix J**.

The third meeting with the Stage 3 Advisory Committee was held on October 16, 2008, at the District's Council Chamber. Discussion Paper No. 4 "Rainwater Management Plan: Scope, Budget and Schedule", Discussion Paper No. 5 "On-Site System Management Options" and Discussion Paper No. 6 "Investigation of Beneficial Reuse of Septage and Treatment Plant Biosolids" were presented and discussed. The minutes of this meeting are presented in **Appendix J**.

The fourth meeting with the Stage 3 Advisory Committee was held on January 22, 2009 at the District's Council Chamber. Plan Monitoring Committee ToR were presented and discussed, as well as suggested modifications to the District's Draft Operational Certificate. The minutes of this meeting are presented in **Appendix J**.

The fifth meeting with the Stage 3 Advisory Committee was held on March 26, 2009 at the District's Council Chamber. Discussion Paper No. 7 "Priority Assessment for Sewering Catchment Areas in the District of Sooke" and the Draft Stage 3 LWMP Summary Report were presented. Comments on both documents by the Advisory Committee were discussed. The minutes of this meeting are presented in **Appendix J**.

5.2 PUBLIC COMMUNICATION

There were three public open houses during the Stage 3 LWMP process. The initial public open house was held September 6, 2008 at the Sooke Community Hall during the Sooke Fall Fair. The second public open house was held May 6, 2009 at the SEAPARC Leisure Complex as part of the District's Community Open

House. The third public open house was held November 30, 2009 at the Sooke Community Hall as part of the Town Hall Open House. In all cases, the consultants for the Stage 2 and 3 LWMP (Rainwater), Downstream Environmental Consulting Ltd, were also in attendance and presented their Rainwater portion of the LWMP development.

For the LWMP (Sanitary), Dave Forgie, Ph.D., P.Eng. of Associated Engineering presented the findings to date of the District's Stage 3 LWMP at a public open house in September 2008. The format of the initial open house was informal, situated amongst craft and agricultural displays of the 2008 Sooke Fall Fair. Poster boards were presented that outlined the tasks of the Stage 3 LWMP process and the work completed to-date, including the estimated costs of sewer expansion for catchment areas outside the District SSA.

Dave Forgie, Ph.D., P.Eng. and Kelly Bush, M.A.Sc., E.I.T. of Associated Engineering presented the findings of the District's Stage 3 LWMP (Sanitary) at the second public house in May 2009. The community open house included presenters from the Capital Regional District; District of Sooke Fire Department; District of Sooke Engineering, Planning, and Corporate Services Departments; Associated Engineering; Downstream Environmental Consulting Ltd.; and the District's current sewage collection and treatment contractor, EPCOR. The presentation booths were set-up around the centre, which allowed the public to interact with each presenter at their own pace. Approximately 100 people attended the community open house. Advertisements for the community open house were published on the District website as well as the Sooke News Mirror (April 29, 2009).

The format of the second community open house was also informal, which encouraged use of displays and poster boards. The poster boards presented the findings of the Stage 2 LWMP and the Stage 3 LWMP to date. A brochure was also prepared for residents, which included information presented on the poster boards and contact information for Dave Forgie to provide any public comments and questions regarding the Stage 3 LWMP. Copies of the brochure and the Draft Stage 3 Summary Report were available for residents to take home.

Dave Forgie, Ph.D., P.Eng. of Associated Engineering presented the updated findings of the District's Stage 3 LWMP at a public open house in November 2009. The format for the public open house was similar to the open house held in May 2009. The Town Hall Meeting included presentations on the Official Community Plan, Strategic Plan – Top "15", 2010 Five Year Financial Plan, Liquid Waste Management Plans, Park Acquisition and Disposal, and more. Approximately 95 people attended the November 2009 Town Hall Meeting. The poster boards presented the updated findings of the Stage 3 LWMP, based on the information presented at May 2009 public house. An updated summary brochure was also prepared for residents, which included information presented on the poster boards and contact information for Dave Forgie to provide any public comments and questions regarding the Stage 3 LWMP. Copies of the brochure were available for residents to take home.

Copies of the advertisements, handout information and the poster boards presented at the May 2009 public open house and the November 2009 open house included in **Appendix K**.

6 Operational Certificate

The District of Sooke is committed to providing a minimum of secondary treatment for all the wastewater that is collected in its sewer system. As part of the LWMP Stage 3 planning, a draft Operational Certificate (OC) has been prepared for the District's wastewater treatment facility. Following approval by the MoE, the OC will replace the District's current registration under the Municipal Sewage Regulation process.

As outlined in the draft OC in **Appendix L**, this currently means never exceeding 45 mg/L biochemical oxygen demand (BOD) and 45 mg/L total suspended solids (TSS) as per the current British Columbia Municipal Sewage Regulation (MSR). Changes to these values would be done in discussion and consultation with the Ministry of Environment (MoE), but would not be revised upwards. If and when it is appropriate, the OC might be amended in the future to comply with changes to the MSR that might result from the Canadian Council of Ministers of the Environment (CCME) Municipal Effluent Harmonization initiative. Such changes could potentially include complying with a 25 mg/L 30 day running average BOD rather than a 45 mg/L maximum BOD. TSS would be similar with a 25 mg/L running average. However, at this point in time, the BC MSR governs the effluent requirements. These MSR requirements are reflected in the draft OC certificate for the District wastewater treatment plant presented in **Appendix L**.

7 Recommendations

Based on the work presented in this Stage 3 LWMP (Sanitary), the following commitments and management options are recommended:

- The District commits to maintaining user payment policies/bylaws that ensure existing SSA users do not pay more than is already prescribed and that any new users, either through in-fill or SSA expansion, pay their fair share of both the capital and operating costs of the wastewater collection and treatment system.

- The District commits to developing a bylaw prohibiting direct discharges from satellite treatment plants to Sooke Harbour or Sooke Basin. The following options are recommended for the District for disposal of satellite treatment plant effluent:
  - Open marine outfall to Sooke Bay,
  - Approved discharge to ground, or
  - Connection to sewer system using a “user-pay” basis.

- The District sets protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside of the SSA. This systematic approach will provide a consistent framework for the District to approve, or negotiate a variation on the proposal they have been given.

- The District commits to continue with development and implementation of a LWMP (Rainwater) Stage 2 and Stage 3 that is consistent with guiding principles for stormwater planning and meets the guidelines of the MoE.

- The District commits to implementing a regulated maintenance program for private on-site septic systems within the District. The following options are recommended for the District for a regulated maintenance strategy for private on-site treatment systems:
  - Develop and implement a public education program;
  - Conduct an inventory of existing septic systems within the District;
  - Identify and monitor water quality “hotspots” within the District; and
  - After three years, review the impact of the public education program on water quality “hotspots”. At which time, the need to develop a bylaw regulating maintenance of on-site septic systems should be reviewed.

- The District, with its treatment plant operator, develops a biosolids management program for beneficial reuse of septic tank and wastewater treatment plant biosolids. The following options are recommended for the District’s biosolids management program:
  - Composting of biosolids at an existing facility on Vancouver Island, such as the Fisher Road facility in the Cowichan Valley Regional District;

- Land application of biosolids for use in reforestation situations.

- The District commits to confirming the preferred order of catchment areas to be included in the SSA in the future. The preferred order of catchment areas could vary based on on-going environmental monitoring activities and the priorities of the District. At this point, of the two highest ranked candidate areas, Whiffin Spit North and Kaltasin, the Kaltasin area is the preferred candidate for the next expansion of the Sewer Specified Area (SSA). This list should be revisited on a five year basis to determine which areas are in greatest need of connection.

8 Cross-over Plan Components from the LWMP (Rainwater)

The LWMP (Rainwater) includes four components that cross over from the Rainwater management area to the Sanitary wastewater management area. These components include the following:

- LWMP (Rainwater) B3 – Develop and implement a cross-connection prevention program to minimize the possibility of facilities connecting sewage flows to the rainwater system
- LWMP (Rainwater) B4 – Manage spills and releases from the municipal sewage collection system
- LWMP (Rainwater) B5 – Provide where appropriate, a facility for the discharge of sewage from holding tanks on recreational vehicles to the sewage collection system (sani-dump)
- LWMP (Rainwater) B6 – Provide, where appropriate, a facility for the discharge of sewage from holding tanks on boats to the sewage collection system (dockside vacuum system) at a public dock or boathouse.

All four of these LWMP (Rainwater) plan components are intended to help prevent the discharge of raw wastewater to the environment, the rainwater collection system or in the case of the boat holding tank discharge, Sooke Harbour or Basin.

The B3 cross-connection plan component should be covered by amending the District's plumbing permits. Enforcement will be through the plumbing and/or building inspectors.

The B4 plan component addresses the need to manage spills and releases from the municipal sewage collection system. The plan recognizes that, under some circumstances, e.g. prolonged power outages, pumping equipment failure or underground excavation, there can potentially be the release of raw wastewater to the environment. Such events are rare and prevention of such spills comes through the selection of robust pump station equipment, including the pumps and their controls, pump station preventative maintenance and/or provision of back-up power, through permanent or portable diesel-powered electrical generator sets. This plan component encourages the District of Sooke to require adequate public information for the prevention and management of all sewage spills and releases from their wastewater collection contracted service provider.

The B5 and B6 LWMP (Rainwater) components are intended to help reduce and/or prevent the dumping of holding tank wastewater from recreational vehicles and boats to the environment. These plan components include provision of sani-dumps for recreational vehicles and a dock-side vacuum extraction system for boats. The development of these facilities will be lead by the District of Sooke through the Municipal Engineer.

From the LWMP (Sanitary) viewpoint, while these recommendations are commendable, their implementation should be done in consultation with the District's wastewater collection system and treatment system contract operator or operators. Recreational vehicle and boat holding tank wastewaters can contain chemicals that are used to keep odours down in the holding tanks but which can cause upsets to the wastewater treatment aerobic biomass in the treatment plant. As a result, discharge of these holding tank wastes to the wastewater treatment plant should be under the control of the contracted treatment plant operator so that plant upsets and going out of compliance on the effluent discharge requirements can be avoided.

9 Implementation Plan - Sanitary

9.1 PROJECTS TO BE IMPLEMENTED

Based on the results of the Stage 3 Sanitary discussion papers and the resulting recommendations, there are four projects to be implemented. These include the following:

- Development and adoption of a bylaw that bans discharge of wastewater effluent from any treatment plants, e.g. satellite treatment plants, into Sooke Basin and Sooke Harbour and any of their tributaries. A draft of such a bylaw, Bylaw 404, is presented in **Appendix H**.
- Development of protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside of the SSA.
- Investigation of biosolids disposal options that result in beneficial reuse rather than the landfilling of the biosolids.
- Development and implementation of a program that develops a septic tank inventory, identifies "hot spots" related to septic tank failures and provides a septic tank operation and maintenance education program. The results of this combined program would be reviewed after three years and the decision regarding the need for a formal septic tank maintenance program would be re-evaluated.
- Preliminary design, design and implementation of a program to sewer the Kaltasin area catchment starting with refinement of the $9,200 per single family equivalent (SFE) cost estimate through a preliminary design study, followed by implementation of the sewering program.
- Review of the LWMP, both Sanitary and Rainwater, in 2015.

A summary of the implementation plan, complete with estimated costs and schedule, is provided in **Table 3**.

Table 3
LWMP (Sanitary)
Plan Activity, Estimated Additional Costs, Implementation Schedule and Status

Plan Activity	Estimated Additional Costs	Implementation Schedule	Status
Development and adoption of a bylaw to ban discharge of wastewater treatment plants to Sooke Harbour, Sooke Basin or any of their tributaries.	$20,000 or approximately $4 per SFE[1]	2010	In Progress, Draft Bylaw 404

Plan Activity	Estimated Additional Costs	Implementation Schedule	Status
Development of protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside of the SSA[2].	$20,000 or approximately $4 per SFE	2010	In progress
Investigation of biosolids disposal options.	$40,000 or approximately $8 per SFE	Investigation 2010, implementation 2011	Pending
Development and implementation of a septic tank inventory and education program.	$40,000 or approximately $8 per SFE	Investigation 2010, implementation 2011 and review in 2014	Pending
Preliminary design of the Kaltasin area sewering project including refinement of costs and determination of availability of grants.	$80,000 or approximately $61 per affected SFE (about 1310 SFEs in the catchment area)	2010	Pending
Implementation and construction of the Kaltasin sewering project.	Current estimate is about $9200 per affected SFE	2011	To be started after the preliminary design study
Review of the next areas to be sewered, after the implementation of the Kaltasin sewering project.	$20,000 or approximately $4 per SFE	2012	
Review of the LWMP.	$40,000 or approximately $8 per SFE	2015	

[1]Single Family Equivalent

[2] Sewer Specified Area

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A Appendix A - Discussion Paper No. 1 - Considerations for Adding New Sewered Areas to the District of Sooke Sewer Specified Area

DISCUSSION PAPER NO. 1

District of Sooke
Stage 3 Liquid Waste Management Plan (Sanitary)

Considerations for Adding New Sewered Areas to the District of Sooke Specified Sewer Area

Issued: April 29, 2010
Previous Issue: August 11, 2009

1 Introduction

As part of Stage 3 of its Liquid Waste Management Plan (LWMP), the District of Sooke (the District) needs to investigate the possibility of adding new sewered areas to its Specified Sewer Area (SSA) sewer and wastewater treatment system. In this consideration, it is necessary to think through and discuss at least two different scenarios, i.e., 1) when the treatment plant has sufficient available capacity and 2) when the treatment plant clearly does not have sufficient available capacity. On top of this, there are also two scenarios for the sewer system, i.e., 1) when the pipes have sufficient capacity and 2) when the pipes clearly do not have sufficient capacity. The issues revolve around paying for new capacity and paying a fair share for at least part of the existing capacity.

The consideration of expanding the SSA has been examined using data developed during a sewer modeling study conducted by Stantec Consulting Ltd. ("Sooke Sewer Model – Conceptual Design Report", May 2008).

These issues are discussed in the following sections.

2 Potential Buy-in Options for Expanded SSA Users

2.1 Expansion of the Sewer Area When the Treatment Plant Does Not Have Remaining Capacity

When the treatment plant does not have remaining capacity, the solution should be simple: add the new sewered area and let the area pay for the required plant expansion - both for capital and operation and maintenance. However, this is a simplistic view that does not consider the cost of running the remaining part of the plant.

The treatment plant has a more or less fixed overhead burden that needs to be paid for. This includes the minimum number of staff, the administrative costs and the operation of the headworks, i.e., screening and grit removal and, perhaps, some of the biosolids management system. When the new service area(s) come onto the sewer system, they should also have to pay for a portion of the fixed costs, not just the marginal costs. In this case, because the new total number of system users will be more than before the expansion, the fixed costs paid by the original system users should drop slightly because the new users are now going to be helping them by paying for a

portion of the total fixed costs. This should help to ease the concerns of the existing users who might be concerned that the new users aren't going to be paying their fair share.

As for the capital costs of the remaining portion of the treatment plant, the original users of the original plant capacity should be paying for their share of the original capital. In the District's case, this will take into account the Federal/Provincial funding grants that left the users in the Core area paying for about 1/3 of the capital. Other original users pre-paid for their 100% (no grant) capital costs up front and are recovering their costs through strata fees or the equivalent.

For the capital cost of the plant expansion, the users of the new capacity should have to pay for the portion of the new capacity that they will be using. If this is without any new grants, then they will have to pay 100% of the portion of the new capacity that they are using. This will undoubtedly be more than the original users would be paying.

One of the "wrinkles" with the new capital cost of the new capacity is it is very unlikely that the new added treatment capacity will be exactly matched with the new demand, i.e., the new capacity will at least be somewhat greater than that needed at the present. So, the question remains, if there is excess new capacity, who pays for it? Certainly not the original users of the plant, since they have been paying for the old capacity. This leaves the new users.

While the new users should definitely have to pay for the new capacity that they are using, it could be argued that they shouldn't have to pay for the excess new capacity because it is beyond what they need and have demanded as part of the new construction. As a result, it is common for the municipality to pay for the new excess capacity in the short run. In the long(er) run, when additional new demands come on and the excess capacity is greater than the new future demand, the new future users can be charged "latecomer" fees that recoup the municipality's costs to that date for constructing and paying for the unused excess capacity.

Operation and maintenance costs will, for the most part, be proportional to the total wastewater flow. As a result, all users, both the original users and the new users, should pay the same based on the total operational costs divided by the total number of users, i.e., single family equivalents (SFEs).

Keeping the accounting straight for the above approach to pay for capital and operation and maintenance costs would be somewhat complicated, but not impossible to keep track of.

2.2 Expansion of the Sewer System When There is Excess Capacity Currently Available

When there is some excess capacity currently available, beyond the needs of the new treatment demand represented by the proposed new sewered area (outside the original sewer area), the situation would be somewhat more complicated than when there is no existing excess capacity. When there is existing excess capacity, there are two main options: 1) to add new capacity for the

new sewered area and leave the existing excess capacity untouched or 2) to use the existing excess capacity for the new service area.

In the first option, the situation would be identical to the "no excess capacity available" situation. In the second option, the situation is different and there are several sub-options.

In the second option, no new capacity would be built immediately to accommodate the treatment demand from the new sewered area. Instead, the new users would use the existing excess capacity. The questions are how should they be charged for the capital cost of using this excess capacity and what happens when there is increased demand from the original sewered area in the future? Should the new comers pay based on the original cost of providing that capacity, with the benefit of the grants that were involved or should they pay based on what new capacity would cost if was built today? The second part of this question relates to the reason why there is excess capacity. Is there excess capacity because the plant was overbuilt for the design connected population or because the plant was sized properly, but the connected population is still lower than the design connected population?

If the plant was oversized and the design connected population is actually the connected population, then the original users have paid too much for the treatment plant, i.e., it is bigger than is actually needed. In this case, the current users should welcome any latecomers because the fees from the latecomers can help to diminish the costs that the original users are paying to be connected to the plant. In this case, it could be argued that the latecomers could indeed be charged a portion of the net-of-grants capital costs, just as they might have done if they were known to the designers at the time of the treatment plant design.

If the plant was properly sized for the connected population, but the connection population is still smaller than design, the existing users have been paying their "fair share", but the owners (the Municipality) have had to come up with the short-fall because of the lack of connections. In this case, the owners (the Municipality) should be more than happy to have the latecomers pay based on the original cost of the facility, with the original grants taken into account.

The above discussion is premised on the idea that the available excess capacity is much greater than the new demand from the "latecomers". The situation gets more complicated when there is some excess capacity, but not enough for all of the new demand. The choices include 1) letting the existing excess capacity be held for future users in the currently sewered area and requiring the proposed new sewered area to pay for their own capacity requirements (as described above) or 2) letting the existing capacity be used up by a portion of the new comers group and then building new capacity for the remaining new comers. In this case, the overall fees can be blended based on a portion of the capacity coming from old excess capacity and the remainder coming from new construction.

Once again, provided that the new capacity technology is similar to the old technology, the operations and maintenance costs should be proportional to the connected population, i.e., flow,

and therefore, the newcomers should simply pay a flow proportional share of the overall total operational and maintenance costs.

2.3 Summary of the Potential Capacity Buy-in Options

There is likely no one answer to the question of how new users should be required to pay for capacity to serve the treatment of the wastewater from the newly sewered area. However, the methodology for making the charges should be determined now, as part of the LWMP process, rather than on a case-by-case, ad hoc, basis in the future.

3 Possibilities of Adding Areas to the SSA in Sooke

The original SSA was based on four catchments, i.e., Sooke Road Lift Station, West Coast Road Lift Station, Helgesen Road Lift Station and a gravity catchment that flows to the wastewater treatment plant (WWTP) without the use of a lift station (pumps). The total number of SFEs that are in these original catchments at the originally assumed development density are 3753 according to the May 2008 Stantec report "Sooke Sewer Model – Conceptual Design Report". This reports suggests that as of February 2008, there were approximately 2200 SFEs connected, implying that there was excess capacity currently available of about 1500 SFEs.

Stantec also examined other sewering alternatives including the following:

- Internal expansion within the existing SSA to the full build-out possible under the existing zoning.
- Internal expansion within the existing SSA to revised new density under revised zoning.
- Servicing the entire District to the Urban Containment Boundary (UCB).

The first new scenario would bring the connected population to about 5,100 SFEs. This would require some changes to the existing sewer system and an expansion of the treatment plant before the connected SFEs reached 4,000. At a 2.5% growth rate, the 5,100 SFEs wouldn't occur until 2042. At a 5% growth rate, 5,100 SFEs would be reached by 2025.

The second new scenario would bring the connected population to 7,200 SFEs and would require significant changes to the sewer system and pump stations. The treatment plant would need one expansion before 4,000 SFEs were reached and another expansion before 6,000 SFEs were reached. At a 2.5% growth rate, the 7,200 SFEs wouldn't be reached until 2055. At a 5% growth rate, 7,200 SFEs would be reached by 2032.

The third new scenario, with the expansion of the SSA, could bring the connected SFEs up to 13,690 (T. Wetmore, EPCOR, Pers. Comm. July 23, 2009). For service populations greater than 7,200 SFEs, as outlined in the second new scenario, additions to the sewer system will be required, including revisions to the existing system as well as the expansions necessary to bring the new areas in. The treatment plant would have to be expanded, in order to accommodate 13,690 SFEs.

At 2.5% growth rate, 13,690 SFEs would not be reached until 2081. At 5% growth rate, 13,690 SFEs would not be reached until 2045.

The third Stantec scenario provided an excellent opportunity to look at the costs of adding potential new areas into the SSA, perhaps much sooner than Stantec envisioned. To do this, the sewer expansion areas were broken down using the catchment areas outlined in Stantec's report. We also used Baseline SFE values and the costs of the associated expansion for the sewers and pump stations and for the treatment plant expansion based on Stantec's Option 1, which examined the District's "status quo". Expansion SFE values were based on revised estimates from those published in Stantec's report (T. Wetmore, EPCOR, Pers. Comm., July 23, 2009).

Expansion costs for each catchment area were also presented in Stantec's report. The cost estimates presented are conservative and subject to change as the project is refined during detailed design. These cost estimates were used to identify overall catchment costs as well as shared costs between catchment areas for infrastructure upgrades. Cost-sharing for sewer and pump station infrastructure upgrades was also included for the following catchment areas:

- Shared cost for new SFEs for Sooke Road upgrades
- Shared cost for new SFEs to infill SSA for West Coast Road upgrades
- Shared cost for new SFEs for West Coast Road upgrades
- Shared cost for new SFEs for Gravity to WWTP upgrades
- Shared cost for new SFEs for Whiffin Spit Upgrades.

Cost-sharing between catchment areas was based on the potential benefit of infrastructure upgrades to new SFE users (T. Wetmore, EPCOR, Pers. Comm., June 4, 2009). For these shared costs and expansion costs for each catchment area, we calculated costs of the sewer and pump station upgrades/expansion on a cost per new SFE (difference between Expansion SFEs and Baseline SFEs) for each catchment area. We then calculated the total cost of the treatment plant expansion (for all four phases) per new SFE, i.e., $35.6 million divided by 9,937 SFEs (13,690 Expansion SFEs - 3,753 Baseline SFEs). The result, approximately $3,583 per new SFE for the future treatment plant capital cost was then added to the shared cost of sewer and pump station upgrades and expansions as well as expansion costs for each catchment area. Overall average costs were calculated as $4,425 per new SFE with treatment cost excluded and $8,007 per new SFE with treatment cost included. The total cost for each catchment area was then compared to the average cost per new SFE with treatment cost included and flagged whether the total cost for each catchment area was less than or greater than this average per new SFE value. The idea is the catchment area costs that are lower than the average SFE expansion costs are the catchment areas that could be considered the most economical additions to the SSA. The other factor is cost of the alternatives, i.e., upgrading an existing Type 1 on-site system to a Type 2 treatment system, which would likely cost in the order of $25,000 to $35,000. The following section is a discussion of these results and the data for this discussion are shown in Table 1 and Figure 1. Figure 1 shows number of Baseline SFEs, the number of possible SFEs in the future, and the total cost per SFE for SSA expansion for each catchment area.

Table 1 - Cost Comparison for Stantec's Option 4 - All Areas are Included in an Expanded SSA

Revision Date: 4-Aug-09

Catchment	Baseline SFE	Expansion SFE[1]	New SFE	Shared Cost to Infill SSA	Shared Cost to New SFEs	Catchment Cost	Overall Cost	Shared Cost per New SFE For Sooke Rd Upgrades[2]	Shared Cost per SFE to Infill SSA For West Coast Rd Upgrades[3]	Shared Cost per New SFE For West Coast Rd Upgrades[4]	Shared Cost per New SFE For Gravity to WWTP Upgrades[5]	Shared Cost per New SFE For Whiffin Spit Upgrades[6]	Catchment Cost per new SFE	Total Shared Cost Per New SFE	Cost of Treatment	Total Cost per new SFE	Below Average?	Likely Priority for SSA Expansion
Original SSA Catchments																		
Sooke Road	1209	2034	825		$ 1,879,500	$ 140,000	$ 2,019,500		$ 3,033		$ 59	$ -	$ 170	$ 3,092	$ 3,583	$ 6,844	Yes	In
West Coast Road	1448	3797	2349	$ 2,693,250	$ 3,565,450	$ -	$ 6,258,700				$ 59	$ -	$ -	$ 59	$ 3,583	$ 3,641	Yes	In
Helgesen Road	272	335	63			$ -	$ -		$ 3,033		$ 59	$ -	$ -	$ 3,092	$ 3,583	$ 6,674	Yes	In
Gravity to WWTP	824	1082	258		$ 561,000	$ 590,000	$ 1,151,000				$ 59	$ -	$ 2,287	$ 59	$ 3,583	$ 5,928	Yes	In
Sub-totals	3753	7248	3495			$ 730,000	$ 9,429,200											
Catchments to the West																		
Westside Sooke	0	0	0			$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -	-	-
Erinan	0	375	375			$ 2,198,350	$ 2,198,350				$ -	$ -	$ 5,862	$ -	$ 3,583	$ 9,445	No	Medium
Sub-totals	0	375	375			$ 2,198,350	$ 2,198,350											
Catchments to the North																		
Addition to West Coast Road	0	55	55			$ 651,000	$ 651,000			$ 677	$ 59	$ 93	$ 11,836	$ 829	$ 3,583	$ 16,248	No	Low
Addition to Helgesen Road	0	0	0			$ -	$ -			$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	-
Foreman Heights Catchment Area	0	1812	1812			$ 4,277,875	$ 4,277,875			$ 677	$ 59	$ 93	$ 2,361	$ 829	$ 3,583	$ 6,772	Yes	High
Sub-totals	0	1867	1867			$ 4,928,875	$ 4,928,875											
Catchments to the South																		
Whiffin Spit North	0	316	316		$ 567,000	$ 1,935,325	$ 2,502,325				$ 59	$ -	$ 6,124	$ 59	$ 3,583	$ 9,766	No	Medium
Whiffin Spit West	0	243	243			$ 2,231,950	$ 2,231,950				$ 59	$ -	$ 9,185	$ 59	$ 3,583	$ 12,826	No	Low
Whiffin Spit South	0	239	239			$ 3,240,650	$ 3,240,650				$ 59	$ -	$ 13,559	$ 59	$ 3,583	$ 17,200	No	Lowest
Whiffin Spit (includes North, West and South)	0	798	798			$ 7,407,925	$ 7,974,925						$ 9,994		$ 3,583	$ 13,576	No	Low
Silver Spray (Needs Whiffin Spit South and West PSs)	0	0	0			$ -	$ -						$ -	$ -	$ -	$ -	-	-
Sub-totals	0	798	798			$ 7,407,925	$ 7,974,925											
Catchments to the East																		
Kaltasin	0	1310	1310			$ 5,493,075	$ 5,493,075	$ 552		$ 677	$ 59	$ 93	$ 4,193	$ 1,381	$ 3,583	$ 9,157	No	Medium
Saseenos (needs Kaltasin)	0	955	955			$ 7,546,875	$ 7,546,875	$ 552		$ 677	$ 59	$ 93	$ 7,902	$ 1,381	$ 3,583	$ 12,866	No	Medium
Goodridge (needs Saseenos)	0	237	237			$ 787,500	$ 787,500	$ 552		$ 677	$ 59	$ 93	$ 3,323	$ 1,381	$ 3,583	$ 8,287	No	Medium
Grouse Nest (needs Goodridge)	0	900	900			$ 5,609,905	$ 5,609,905	$ 552		$ 677	$ 59	$ 93	$ 6,233	$ 1,381	$ 3,583	$ 11,197	No	Medium
Sub-totals	0	3402	3402			$ 19,437,355	$ 19,437,355											
Overall Totals (without treatment)																		
Totals	3753	13690	9937				$ 43,968,705					**Average Cost per New SFE (without treatment)**				**$ 4,425**		
Cost of Additional Treatment																		
Phase II							$ 2,800,000											
Phase III							$ 2,800,000											
Phase IV							$ 30,000,000											
Sub-totals	3753	13690	9937				$ 35,600,000					**Cost of Treatment**				**$ 3,583**		
Overall Totals with Treatment	3753	13690	9937				$ 79,568,705					**Average Cost per New SFE (with treatment)**				**$ 8,007**		

Notes:

[1] Based on updated SFE expansion values provided by EPCOR (T. Wetmore, July 23, 2009)

[2] Of $2,019,500 for total expansion costs, $140,000 benefits Sooke Rd. Remaining $1,879,500 distributed evenly among new SFEs in Kaltasin and the Flats, Saseenos, Goodridge, and Grouse Nest.

[3] Of $6,258,700 for total expansion costs, $2,693,250 distributed evenly to infill SSA (Helgeson Rd. and Sooke Rd.).

[4] Of $6,258,700 for total expansion costs, $2,693,250 distributed evenly to infill SSA (Helgeson Rd. and Sooke Rd.). Remaining $3,565,450 distributed evenly to new SFEs in Foreman Heights, Addition to Helgeson Rd., Addition to West Coast Rd., Kaltasin and the Flats, Saseenos, Goodridge, and Grouse Nest.

[5] Of $1,151,000 for total expansion costs, $590,000 benefits Erinan. Remaining $561,000 distributed to new SFEs in all catchment areas inside the SSA and outside the SSA.

[6] Of $2,502,325 for total expansion cost, $1,935,325 benefits Whiffin Spit North. Remaining $567,000 distributed evenly among new SFE users to the North and East of Whiffin Spit North. Whiffin Spit (North, West and South) Total Cost per New SFE was based on Overall Cost / New SFEs plus the Cost of Treatment.

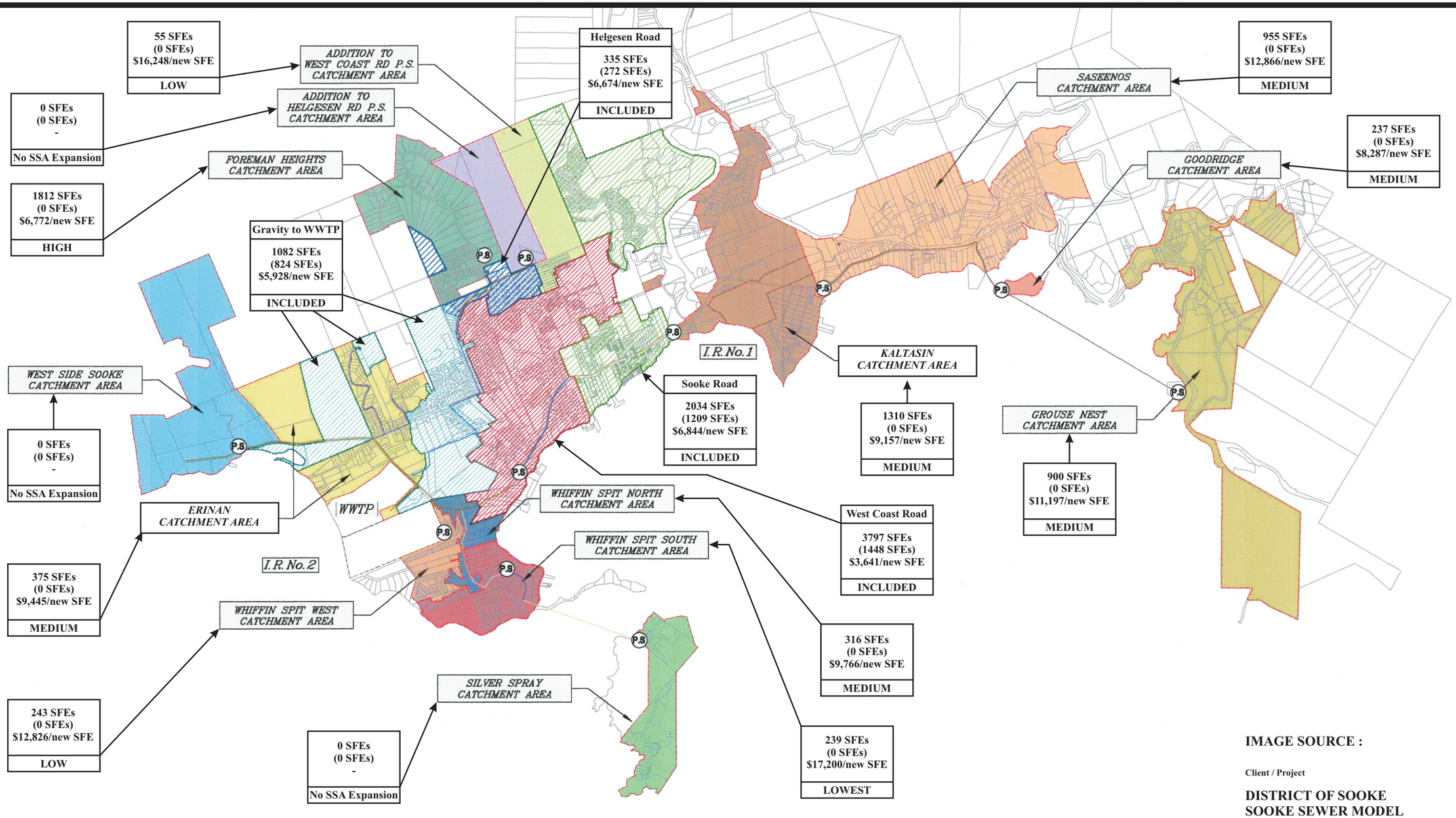

Figure 1
Cost Comparisons of Stantec's Option 4

LEGEND :

Number of new SFEs (Baseline SSA SFEs) Total cost per new SFE
RATING for Inclusion in SSA

IMAGE SOURCE :

Client / Project

DISTRICT OF SOOKE
SOOKE SEWER MODEL
CONCEPTUAL DESIGN REPORT

Figure No.

4.5.3

Title

NEW CATCHMENT AREA LOCATIONS AND BOUNDARIES

STANTEC CONSULTING LTD.

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For the original SSA catchments, the total costs per new SFE for all catchment areas are less than the average SFE expansion cost. This is good, as densification of the catchment areas in the SSA appears to be a feasible option. However, the question is what about areas outside of the current SSA?

For the catchments to the west, no further SFE expansions will take place in Westside Sooke. Erinan catchment area is slightly above the average SFE expansion cost at about $9,450 per new SFE. This cost is still substantially less than a Type 2 on-site treatment option.

For the catchments to the north, the addition to West Coast Road catchment area is well above the average SFE expansion cost at about $16,250 per SFE. No further SFE expansions will take place in the addition to Helgesen Road. The Foreman Heights catchment area is below the average SFE expansion cost at about $6,770 per SFE. This result indicates to us that the Foreman Heights catchment area is a prime economic candidate for potential inclusion in the SSA.

For the catchments to the south, these areas include Whiffin Spit (Whiffin Spit North, Whiffin Spit West, and Whiffin Spit South) and Silver Spray catchment areas. Whiffin Spit North, Whiffin Spit West, and Whiffin Spit South are all above the average SFE expansion cost. For example, Whiffin Spit South at about $17,200 per new SFE is much higher than the overall average SFE expansion cost of $8,007 per new SFE. However, the expansion cost for Whiffin Spit South is still less than the Type 2 on-site treatment plant cost range. Whiffin Spit North and Whiffin Spit West expansion costs range from approximately $9,770 to $12,830 per new SFE, which is above the overall average SFE expansion cost of about $8,000 per new SFE, but is also below the individual Type 2 on-site treatment plant costs. One option for the Whiffin Spit catchment areas is to combine infrastructure costs for Whiffin Spit North, Whiffin Spit West, and Whiffin Spit South. This approach would result in an expansion cost of about $13,580 per new SFE, which is still above the average SFE expansion cost, but equalizes costs among new SFE users. No further SFE expansions will take place in the Silver Spray catchment area.

For the catchments to the east, the situation is similar to the catchments to the south. Kaltasin at about $9,160 per new SFE is above the average SFE expansion cost, but well below the likely cost of an individual Type 2 on-site treatment system. The Saseenos area on its own would be about $12,870 per new SFE, not including the downstream upgrades needed in Kaltasin to make Saseenos work. Goodridge at about $8,290 per new SFE is slightly above the average SFE expansion cost, while Grouse Nest at about $11,200 is above the average SFE expansion cost. The story for Goodridge and Grouse Nest catchment areas is further complicated by the fact that Goodridge appears to need at least part of the Saseenos system and Grouse Nest needs Goodridge (and therefore, Saseenos, and so on).

Based on the above analysis and Table 1, the area that appears to be most economically feasible to include in an expanded SSA is the Foreman Heights catchment area.

The next group of catchment areas that could be considered to include in an expanded SSA are Erinan, Whiffin Spit North, and the four catchments to the east. SSA expansion that includes the catchments to the east could be taken as a whole or phased in the following order: Kaltasin, Saseenos, Goodridge, and Grouse Nest.

The last group of catchment areas that could be considered to include in an expanded SSA are addition to West Coast Road and catchments to the south. Whiffin Spit North is the lowest expansion cost per SFE of the Whiffin Spit catchment areas and is comparable in cost to other areas, such as Erinan and Kaltasin catchment areas. The Whiffin Spit South expansion cost at about $17,200 per SFE is the highest overall expansion cost per SFE and prohibitively high compared to other catchment area expansion costs. However, should the District decide to implement sewering of the entire Whiffin Spit catchment area, one option to consider is cost-sharing of infrastructure among all new Whiffin Spit SFEs, which would equalize the overall expansion costs for the area.

4 Conclusions

Methods of allocating costs were discussed. Whatever method is chosen, the guiding principle would have to be that the existing SSA users continue to pay their fair share and that new users, either through in-fill or expansion, pay an equitable portion of capital and operating costs. In doing so, there may be situations where there is new excess capacity that would have to be initially financed by the District and then “sold” via latecomers fees to subsequent additions to the SSA.

Based on an examination of the potential to expand the SSA, it would appear that there are three groups, with decreasing economic feasibility, for any SSA expansion. These three groups include the following:

- An area that appears to be most economically feasible to include in an expanded SSA – Foreman Heights catchment area.
- A group of areas with medium economic feasibility - Erinan, Whiffin Spit North, and the four catchments to the east, likely taken as a whole or phased in the following order: Kaltasin, Saseenos, Goodridge, and Grouse Nest.
- A group of areas that have low economic feasibility - West Coast Road and catchments to the south including Whiffin Spit West and Whiffin Spit South. Whiffin Spit South is prohibitively high in cost per new SFE for SSA expansion at this time; however, should the District decide to implement sewering of the entire Whiffin Spit catchment area, one option to consider is cost-sharing of infrastructure among all new Whiffin Spit SFEs, which would equalize the overall expansion costs for the area.

KB/lp

B Appendix B - Discussion Paper No. 2 – Satellite Treatment Plant Effluent Standards

DISCUSSION PAPER NO. 2

District of Sooke
Stage 3 Liquid Waste Management Plan (Sanitary)

Satellite Treatment Plant Effluent Standards

Issued: September 9, 2008
Previous Issue: None

1 Introduction

A satellite wastewater treatment plant is a plant that services an area that has a sewer system that is not connected to the main sewer specified area. As such, the treatment plant has to be able to accept and treat all the wastewater that is directed to it and has to meet an agreed-to minimum effluent quality standard. Two potential examples of this situation could be the Grouse Nest and Silver Spray areas of the District of Sooke. There could be others, should the need arise.

As part of the Stage 2 LWMP final report, it was recommended that satellite treatment plants be allowed within the District, but only if the treatment standard was that for reclaimed water use under the Municipal Sewage Regulation (MSR). Under this standard, the effluent from the satellite treatment plant would have to reduce the organic content so that the biochemical oxygen demand (BOD) would be less than 10 mg/L. The effluent would have to be very clear with less than 2 nephelometric turbidity units (NTU) (about the same as less than 10 mg/L total suspended solids (TSS)). There would have to be disinfection to the point that there would be less than 2.2 fecal coliforms per 100 mL (swimming standards are less than 200 fecal coliforms/100 mL; shellfish water standards are less than 14 fecal coliforms/100 mL). This means that the effluent would be very clear and well disinfected. Based on the MSR, the effluent would be suitable for a wide variety of reuse options, but could also be discharged to a surface water without any dilution, i.e. it could be used for stream augmentation. The most likely treatment process that could achieve this exceptional effluent quality is a membrane bioreactor (MBR). MBRs are available in a wide range of capacities and are being marketed locally in a package plant form that would be suitable for serving a number of homes in a satellite treatment situation.

The original intent of recommending the reclaimed water standard for satellite treatment plants in Stage 2 of the LWMP, was to avoid the need for new outfalls discharging into Sooke Basin and/or Sooke Harbour. The thought was these satellite treatment plants would discharge to a local creek or stream without need for an outfall. If the stream or creek discharged to Sooke Basin or Harbour, there would be an additional treatment requirement to remove phosphorus to less than 1 mg/L to help prevent algal blooms.

When the Ministry of Environment (MoE) reviewed the Stage 2 LWMP prior to its approval, they noted correctly to the District that meeting the reclaimed water standard was very onerous in terms of redundancy and monitoring requirements. For example, according to the MSR, if the treatment

plant proponent commits to meeting the reclaimed water standards, then the treatment plant will never be permitted to exceed that standard, even for a short time, even if it would still meet the MSR secondary treatment standard of less than 45 mg/L BOD and 45 mg/L TSS. This would mean that the treatment plant would have to have a significant amount of equipment redundancy, e.g. dual treatment trains, so that if there was an equipment or process malfunction, the effluent quality would not be impaired. In addition to the redundancy, it could also mean that the plant has to have off-line storage so that any off-spec effluent that does not meet the reclaimed water quality requirements could be temporarily stored until the treatment plant problem was fixed and then reprocessed once the plant was fully operational again. On this basis, the MoE suggested that the District might want to revisit the requirement for this standard.

This discussion paper is intended to examine the options. These options include maintaining the requirement for the reclaimed water quality standard or allowing a lower standard, i.e. the normal secondary treatment standard.

2 Maintaining the Reclaimed Water Quality Standard for Satellite Treatment Plants

From the District of Sooke's viewpoint, there is very little downside to maintaining the requirement for satellite treatment plants having to meet reclaimed water quality standards. The proponent, likely a developer, would have to engage a professional engineer to design the treatment plant to meet the MSR requirements including the effluent requirements and all of the redundancy requirements. This would result in a treatment plant that would be more expensive and more complicated to operate than a conventional secondary treatment plant, including the District of Sooke's current sequencing batch reactor (SBR) treatment plant. This would likely require that the treatment plant owner, i.e. initially the developer and then the resulting strata corporation, to post a bond to ensure that the treatment plant is maintained and operated properly. This likely also means that the strata corporation would likely want to engage the services of companies like Corix or EPCOR to operate the treatment plant. (Note: EPCOR currently operates the District of Sooke SBR treatment plant). If, for some reason, the District had to take over the ownership of the treatment plant (perhaps as the result of strata corporation problems), the District would likely contract the operation and maintenance of the satellite treatment plant and then pass the costs back to the users through taxes or flow-base fees as a specified sewer area. In this latter case, the District would have to develop a bylaw that defines a new specified sewer area that would replace the old strata corporation for this particular service function.

The upside would be the avoidance of the need for outfalls into Sooke Harbour, Basin and/or Bay, which was the original intent of the Stage 2 LWMP recommendation.

The only "wrinkle" in this situation is, since the Stage 2 LWMP was submitted for approval, science has shown that wastewater treatment plant effluents contain endocrine disrupting chemicals (EDCs) and personal pharmaceutical care products (PPCPs) that can, in some situations, result in the "intersexing" of fish (potential for some male fish to develop female characteristics) in some

discharge surface waters (typically a low flow/low dilution ratio creek or stream). Fortunately, the MBR process is one of the best treatment processes for the biological removal of EDCs and PPCPs. While there is currently no legislation that would require any treatment plant to remove EDCs and PPCPs to a certain level, erring on the side of (pre)caution would lead to additional treatment following the MBR. This could include advanced oxidation, e.g. a combination of ozone and UV or hydrogen peroxide and UV, reverse osmosis, or, potentially, a constructed wetland. While the constructed wetland is a much simpler method of treatment, because of its biological nature that would not be able to exclude use by wildlife (animals and birds) , the wetland effluent quality would likely be at least slightly worse than the effluent from the MBR plant in terms of BOD and fecal coliform concentrations. As a result, it might be difficult to guarantee the effluent quality, as would be required under the MSR requirements. This would lead back to the use of advanced oxidation or reverse osmosis that would further complicate the treatment plant and add to its capital and operating costs. Another potential option, not yet proven to work, would be to discharge the MBR effluent to the ground via surface distribution or rapid infiltration basins, and use the flow through the ground help to remove EDCs and PPCPs.

Overall, the cost of this option would be significant. However, it would avoid the need for outfalls.

3 Allowing Satellite Treatment Plants to Meet the MSR Secondary Treatment Requirements

If it was felt that requiring that satellite treatment plants in the District of Sooke to meet the reclaimed water effluent standard was too onerous for developers or strata corporations to have to meet, then the only other option is require a lower standard, i.e. secondary treatment, and then work around the effluent discharge requirements. Secondary treatment requirements are currently always less than 45 mg/L BOD and always less than 45 mg/L TSS. Future effluent requirements might be less than 30 mg/L BOD and TSS based on a running average of samples taken and analyzed, e.g. a 30 day running average. In either case, the discharge of such effluents to surface waters requires that there be a certain minimum dilution available in the creek, stream, river, lake or ocean. This would rule out the discharge of the satellite treatment plant effluent to anything but something the size of Sooke River and, even so, even the Sooke River could be too small during lower flow periods. This would lead to two potential options: outfalls and land disposal.

An outfall is a submerged pipe that conveys the treatment plant effluent into a surface water, e.g. Sooke Harbour, Basin or Bay, to a depth that will permit sufficient dilution (i.e. at least 40:1 dilution) and dispersion of the effluent such that there will be minimal, if any impacts on the environment, including depletion of dissolved oxygen and EDC and/or PPCP-related impacts. Such is the case with the current District of Sooke SBR treatment plant effluent outfall that runs out into deep water in Sooke Bay. This may not be the case in Sooke Harbour or Basin.

Sooke Harbour and Sooke Basin are relative shallow and not particularly well flushed. As a result, discharging secondary treatment effluent may not be diluted and dispersed sufficiently. It may also mean that there could be nutrient-related issues that would require the removal of phosphorus to

less than 1 mg/L prior to discharge in order to prevent algal blooms in the Harbour and/or Basin. This latter requirement would add to the cost of constructing and operating the treatment plant, e.g. alum addition to precipitate out phosphorus.

Discharging treated wastewater to Sooke Harbour and Basin will also potentially impact the possibility of opening up shellfish harvesting in Harbour and Basin. One way to mitigate this potential problem would be to require disinfection to the point that there would be no more than 14 fecal coliforms per 100 mL in the shellfish areas. Typically, this would mean that the effluent would be disinfected to something in the order of 200 fecal coliforms per 100 mL.

One solution to the above problems with discharging to Sooke Harbour or Basin would be to allow secondary treatment instead of reclaimed water quality standards, but also require that any such satellite secondary treatment plant discharge only through an ocean outfall to Sooke Bay. Furthermore, these outfalls would have to be long enough to reach outside the “embayed” waters definition (inside a line 6 km long from headland to headland) and, therefore, eliminate the need for phosphorus removal. They would also likely require environmental impact assessments covering both the construction and the long term operation of these outfalls. Such outfalls would be very costly and would likely be onerous for small stratas to pay for.

4 Conclusions and Recommendations

Based on the above, there are no easy solutions to allowing satellite treatment systems. Requiring that the effluent meet reclaimed water quality standards would help to avoid the need for outfalls but it would not negate the need for phosphorus removal if the discharge ended up in Sooke Harbour or Basin. Discharging reclaimed water quality effluent into small creeks as stream augmentation raises the possibility of impacts on fish resident in those creeks. This would require additional treatment such as advanced oxidation or a constructed wetland. In all cases, requiring reclaimed water quality effluent would mean that the treatment plant have a high level of redundancy and monitoring that will further increase the cost of already more expensive treatment process.

The other alternative of permitting satellite plants to meet secondary treatment standards would require that the effluent be discharged via outfalls. While this helps to get around the potential problems with discharging to creeks and streams, it does open up other issues, i.e. construction and operation of outfalls, impacts on Sooke Basin and Harbour, e.g. fecal coliforms, dissolved oxygen, nutrient removal, etc. One potential solution would be to require that secondary treatment plants discharge to open marine waters of Sooke Bay. This would require a relatively long and costly outfall raising the capital and operating costs of the treatment system.

Based on the above, the recommendation is to stay with the reclaimed water quality standard for effluents from satellite treatment plants and add phosphorus removal and, potentially, advanced oxidation or a constructed wetland before discharge to the creeks or streams.

C Appendix C - Discussion Paper No. 3 – Treatment Options for Areas Around Sooke Basin and Harbour

DISCUSSION PAPER NO. 3

District of Sooke
Stage 3 Liquid Waste Management Plan (Sanitary)

Treatment Options for Areas Around Sooke Basin and Harbour

Issued: September 10, 2008
Previous Issue: None

1 Introduction

The District of Sooke has a Specified Sewer Area (SSA) that serves a large majority of the residential, commercial and institutional core of the District. Areas outside of the SSA currently remain on some form of on-site treatment with ground disposal. At the individual home owner level, this on-site treatment is likely to be a Type 1 conventional septic tank system, but it could also be a Type 2 packaged wastewater treatment system with ground disposal. There are also some situations of Type 1 and Type 2 treatment systems with ground disposal for clusters of dwellings, i.e. individual homes or townhouse developments, up to and including 16 single family equivalents (SFEs), typically under a strata corporation.

For new approved developments within the SSA, there is no need for on-site treatment, just an approved connection to the SSA and the treatment plant, with fees paid for hook-up and on-going costs, as required. Outside the SSA, new developments have three main options:

- Expansion of the SSA to include the area in question
- Satellite treatment and appropriate disposal
- On-site treatment

The remainder of this discussion paper covers these three options.

2 Expansion of the SSA to Include the Area in Question

Technically, it is possible to expand the SSA by adding the required sewers and pump stations, and increasing the capacity of the wastewater treatment plant. However, as was shown in Discussion Paper 1 (DP1), the cost of expanding the SSA varies from area to area, with some areas being less expensive to add and other areas being much more expensive to add. DP1 identified that it was possible to group the areas outside the current SSA into three groupings based on the likely economic feasibility of adding them to the SSA. In general, the areas that were most feasible for addition, based on economics, were those to the north and west of the SSA. This is primarily based on the terrain in these areas that will, for the most part, allow gravity flow to the wastewater treatment plant. Areas to the east of the SSA were more expensive to bring into the SSA and, in some cases, would rely on a cascade effect, i.e. one area could not be added easily without the area beside it (closer to the SSA) being added first. An example of this is Grouse Nest, which

could not be added without Goodridge, which could not be added with out Saseenos, which could not be added (easily) without the Kaltasin area. These areas were given a “medium” feasibility classification. The areas that were most expensive to be added were the areas on Whiffin Spit and across the Harbour to Silver Spray. These areas were deemed to be very expensive to add and would normally be given a low or very low feasibility for addition to the SSA.

On this basis, adding an area to the SSA that is in the “medium” or “low” priority category is unlikely, but not impossible.

One way that such areas could potentially be added to the SSA would be if a developer decided that they wanted to connect to the SSA, regardless of the cost and existence of complementary infrastructure, i.e. sewers in the adjacent catchment. In such a case, the developer would have to convince District Council that they will pay for all of the required infrastructure, including any required treatment plant capacity upgrades. Naturally, the cost of this new infrastructure would eventually be borne by the purchasers of the properties in the proposed development.

For purposes of discussion, the new area in question could be one similar to Grouse Nest or Silver Spray. The developer would have to pay for the internal sewer system in the proposed development and any necessary pump stations, force mains (pressure sewers) and gravity sewers that would be required to convey the collected wastewater to the nearest SSA connection point. In a “Grouse Nest”-like situation, this would include a pump station in the Goodridge area, a force main and sewers along Highway 14 to the Saseenos/Kaltasin catchment border, another pump station at the point, another force main and sewer along Highway 14 to the existing Sooke Road pump station and then all necessary upgrades between that point and the treatment plant, and, finally, the necessary upgrades to the treatment plant. While that would involve a considerable amount of money, the developer would have developed a business plan that says that the lot prices will pay for the cost.

What is most interesting at this point is the fact that the infrastructure that would be put in from the new development to the treatment plant, in theory, would only need to accommodate the extra flows from the new development. In reality, additional capacity should be built into the new infrastructure so that future development could be facilitated. For example, in this “Grouse Nest”-like example, the Goodridge Pump Station and force main could be designed to accommodate a future Goodridge development. Similarly, the Saseenos Pump Station could be designed to accommodate future development in Saseenos. This might be as simple as designing the pump station so that, in future, larger pumps could be installed when they are needed. That said, the pipe that goes in the ground should likely be sized for future potential flows, not just the flows from the proposed development. The same would be true all the way to the treatment plant.

The question would be, “Who pays for the extra infrastructure capacity?” Some would argue that the developer should pay for it all because that is what the District requires. The developer would argue that the District is asking too much but they would gladly pay for what they (the developer) needs. The difference would be a point of negotiation between the District temporarily paying for

the extra and the developer paying for the extra. If the developer paid, they would have very little means of recovering the cost, except perhaps, a negotiation with the District that reduces their taxes (or the property owner's taxes) for a number of years, sufficient to recoup the costs. If the District paid for the extra capacity, the District could recover costs through connection or later-comers fees that would, eventually, cover the additional costs. In the interim, the District would have additional debt to pay for the extra capacity.

3 Satellite Treatment and Appropriate Disposal

Discussion Paper 2 (DP2) discussed the issue of satellite treatment in the context of what effluent standards should be required and the interaction between the effluent standards and the disposal point, i.e. stream augmentation or outfalls to Sooke Harbour or Basin. DP2 concluded that the original Stage 2 recommendation that the minimum effluent requirement of the MSR reclaimed water quality, including disinfection to protect shellfish harvesting, was appropriate, despite the recognition that additional measures, e.g. advanced oxidation or constructed wetland, and phosphorus removal should also be required. DP2 raised the possibility of allowing a satellite treatment plant to only treat to secondary treatment standards but only if the disposal was via outfall to Sooke Bay. This would help to avoid issues with endocrine disrupting chemicals, nutrients and pathogens (as measured by fecal coliform concentrations).

Based on the above, satellite treatment and appropriate disposal will not be inexpensive. Any developer considering the need for wastewater treatment would have to include such costs in their business plan development, along with the cost of connecting to the SSA, as discussed in Section 2, or having on-site systems, as discussed in Section 4.

4 On-site Treatment

If there isn't going to be a connection to the SSA or if there isn't going to be satellite treatment to reclaimed water quality or secondary effluent standards (with appropriate disposal facilities), then the only way a development would occur outside of the SSA is via on-site treatment. Such treatment could be conventional Type 1 septic systems or Type 2 mechanical/biological secondary treatment package plants. Both would discharge to the ground. If the flows were kept below 22.7 m^3/day (approximately 16 single family equivalents (SFEs) or less), then the administration of the treatment facility would be through a registration under the Health Act's 2005 Sewerage Regulation and its current amendments. If the flow was more than 22.7 m^3/day, then the facility would be registered with the Ministry of Environment under the 1999 Municipal Sewage Regulation (MSR) and its current amendments. In both cases, qualified professionals would need to be involved. For Sewerage Regulation registrations, registered practioners could also be involved. In all cases, the onus is left with the designer/installer and the owner to continue to meet the respective requirements now and in the future.

From a developers view point, on-site treatment might be less costly than the SSA connection option or the satellite treatment option but it will also likely mean that the number of lots that are

possible from the given parcel might be lower than with the other options. This point cannot be determined with certainty because the size of lot chosen for the development may be independent of the technical reasons for a certain lot size. In Stage 2 of the LWMP, a protocol for determining the minimum size of lot that would support a Type 1 septic system, with reserve for a future disposal field, was developed. In most cases, for any soils with reasonable percolation characteristics, the minimum lot size was between 2200 m^2 and 3000 m^2. At the time of Stage 2, the comparison was existing lots with septic systems that were in the 800 m^2 and 900 m^2 range that were, in no way, sustainable on Type 1 systems. This type of analysis is what led to the development of the current SSA and its sewer system and treatment plant. This would not necessary apply to a new development.

A new development might be premised on the idea that everyone will have a 0.5 hectare lot, just for life style reasons, i.e. having some distance between you and your neighbours. In such a case, it quite likely that on-site Type 1 treatment will be feasible (subject to soil conditions and percolation testing). If the developer decided to install individual Type 1 systems on these lots (and they met the Sewerage Regulations), then the issue should be acceptable to all involved. However, the developer could chose to sewer the lots and install a cluster treatment system, e.g. 16 homes on a single, larger Type 1 or Type 2 treatment system, with the treatment plant and disposal field on common strata property (note: we have learned that some developers have held treatment and disposal field properties for themselves so that when sewer comes in, they can dismantle the treatment system and sell the lots for their benefit – we disagree with this practice and question its legality). If the developer installed such a cluster system (or systems), it would be so the individual lot/home owners do not have to worry about their own treatment systems, except through payments to the strata corporation which would arrange all necessary operation and maintenance of the system.

5 Other Factors

If there are developments outside of the SSA and they involve satellite treatment or cluster treatment systems, the District will have concerns about the long-term viability of these systems and who will inherit them should something go wrong. This points out one advantage of the MSR in that, as a part of the MSR application by private individuals (and presumably a strata corporation), there is a requirement for a bond to be posted, to be held in trust. The idea is if something goes wrong with the treatment plant or its operation, the strata corporation will have money available to make the necessary repairs or replacements, without putting any onus on the District to “bail out” the strata corporation. Such bonds are not required under the Health Act and therefore, it might be more difficult to prevent “hardship” problems from occurring in the future should a cluster system fail and the strata is unable to fix the problem in a timely manner.

One possible fix to the problem stated above would be to institute a bylaw under the Liquid Waste Management Plan that would require developers of cluster systems under the Health Act within the District of Sooke to post bonds. These bonds would be subsequently signed over to the strata corporation, to be held in trust, for such an eventuality.

6 Conclusions

There are three options that could be used to provide wastewater treatment to new developments outside of the current SSA. These include:

- A developer-instigated and paid for connection to the SSA, with all the required piping, pump stations, and treatment plant upgrades required to service the new area paid for by the developer. Adding additional capacity for future developments at the same time would likely be a wise long term decision. Deciding who should pay for this additional extra capacity, the developer and/or the District, would be a subject of negotiations between the District and the developer.

- Satellite treatment system(s) with appropriate levels of treatment and effluent disposal.

- On-site systems, either individual on-site or cluster systems, with appropriate levels of financial bonds for the cluster systems put in place regardless of whether the cluster is under the Ministry of Environment or Ministry of Health jurisdiction (the latter would require a bylaw under the LWMP).

Knowing these options, a developer will do their own due diligence and develop costs and projected revenues for various lot size and lot number scenarios under the three different treatment options. Depending on the results, they will make a choice and approach District Council with a development proposal. Based on the final results of this Stage 3 LWMP development, District Council should have a set of protocols that they can follow as they review the proposal and decide whether they wish to approve the development proposal or not or negotiate a variation on the proposal they have been given.

D Appendix D - Discussion Paper No. 4 – Rainwater Management Plan: Scope, Budget and Schedule

DRAFT DISCUSSION PAPER NO. 4

District of Sooke
Stage 3 Liquid Waste Management Plan (Sanitary)

Rainwater Management Plan: Scope, Budget and Schedule

Issued: October 8, 2008
Previous Issue: None

1 Introduction

The District of Sooke has completed construction of sewage collection and treatment facilities to service the core area of the community. As a condition of the Provincial grant to assist in the construction of the new collection and treatment system, the District of Sooke was required to develop a Liquid Waste Management Plan (LWMP). Such plans are typically done in three stages and typically include stormwater management, i.e. management of snow-melt and rainwater, as well as management of wastewater (sewage). Stage 1 of the LWMP for wastewater was deemed to have been completed as part of the work done to develop the core area sanitary sewer system. Stage 2 of the LWMP for wastewater focused on the areas outside of the Core Area sewer system and, in particular, on domestic and commercial wastewater, but not on stormwater.

Running in parallel with this LWMP (Wastewater) in 2006, the District of Sooke commenced work on a separate component of the same LWMP for Stormwater. The purpose of a LWMP (Stormwater), Stage 1 is to introduce stormwater management issues to the community and provide a realistic set of stormwater management actions considered appropriate for detailed investigation and discussion in the District of Sooke LWMP (Stormwater) Stage 2. Once the final LWMP (Stormwater) has been approved by the provincial government it will become a written record of the District's decisions and plans for the management of stormwater and will likely be adopted into the District of Sooke Official Community Plan.

A consultant was engaged by the District of Sooke to undertake the Stage 1 LWMP (Stormwater) activities, which resulted in the development of the following three documents:

- District of Sooke, Liquid Waste Management Plan (Stormwater), Stage 1 Technical Support Document, November 28, 2006
- District of Sooke, Liquid Waste Management Plan (Stormwater), Stage 1 November 28, 2006
- District of Sooke, Liquid Waste Management Plan (Stormwater), Stage 1 Summary of the Public Involvement Process, September 13, 2007

The Technical Support Document investigated 22 tasks identified in the Stage 1 Terms of Reference and the Stage 1 Plan report provides a summary of the findings. Both documents are

available on the District of Sooke website and were prepared to meet Province of British Columbia expectations for the process, content and delivery of a LWMP (Stormwater), Stage 1.

The LWMP (Stormwater), Stage 1 received provincial Ministry of Environment approval in a letter dated February 7, 2008. In that letter the province also approved the District's request to combine Stages 2 and 3 of the Stormwater Plan. The province also requested that the final wastewater and stormwater plans be submitted "as one package". As part of the December 2007 approval of the Stage 2 LWMP (Wastewater), the Ministry of Environment required that, if the wastewater and stormwater LWMPs could not be sync'd perfectly, at the very least, a schedule and budget to complete the LWMP (Stormwater) be included in the Stage 3 LWMP (Wastewater) document.

The District of Sooke is now moving forward with the development of a LWMP (Stormwater), Stages 2 and 3. The Terms of Reference (ToR) for this work were prepared to meet provincial expectations for the process, content and delivery of a LWMP (Stormwater), Stages 2 and 3. Provincial guidelines require that the ToR must be prepared in consultation with the Regional Environmental Protection Manager. This has been done and all issues were identified in a letter from the province dated February 7, 2008.

A consulting firm, Downstream Environmental Consulting Ltd. was hired to complete Stage 2 and 3 of the LWMP (Stormwater). At the first Advisory Committee meeting for Stage 2 and 3, the consultant and the committee (including provincial representatives), it was agreed that the Stage 2 and 3 work will develop a LWMP that will focus on rainwater since it was thought to be more accurate than "stormwater" which is rainfall associated with individual storms rather than the overall more inclusive "rainwater" that includes both rainfall from both storm and non-storm events. The remainder of this document refers to Stage 2 and 3 as LWMP (Rainwater).

2 Terms of Reference for the Stage 2 and 3 LWMP (Rainwater)

The District of Sooke LWMP (Rainwater), Stages 2 and 3, will be consistent with provincial objectives and principles of sustainability. The consultant will manage the Plan development using the five guiding principles identified in Stormwater Planning: A Guidebook for British Columbia (May 2002). These five principles are located in the Guidebook's Executive Summary. The entire document can be accessed from the Ministry's website at:

http://www.env.gov.bc.ca/epd/epdpa/mpp/stormwater/stormwater.html

The final LWMP (Rainwater) will provide direction on the following to ensure that:

- Municipal stormwater infrastructure is developed in a manner that will result in healthy watercourses and a healthy near shore marine environment.
- Watershed-based management approaches can be implemented to protect Sooke's 14 watersheds.

- Low impact development techniques are employed to maintain and where possible restore the pre-development hydrologic regime of urbanized and developing watersheds.
- Biological and chemical contaminants do not enter stormwater flows in the first place (stormwater source control).
- A green infrastructure approach to stormwater management is taken to provide for cleaner air through well treed riparian zones and streetscapes.

The Plan will be developed with significant input from the municipal planning and engineering departments. Development of the Plan will require the consultant to undertake detailed investigations of all 71 recommendations identified in the District of Sooke Liquid Waste Management Plan (Stormwater), Stage 1. More detailed background and information on the recommendations in the Stage 1 Plan can be found in the District of Sooke Liquid Waste Management Plan (Stormwater), Stage 1, Technical Support Document available on the District website. The Technical Support document contains a large number of links to helpful information sources used in development of the Stage 1 Plan.

The full ToR for the Stage 2 and 3 LWMP (Rainwater) is attached in Appendix A.

In addition to the ToR, the Ministry of Environment added several requirements. As a result, in addition to the Tasks identified in the ToR, Downstream Environmental Consulting Ltd. will undertake the following provincial and project requirements during the course of the contract:

- Integrate the various aspects of the Final Stage 2 and 3 Report.
- Confirm the final report meets the requirements of the new enhanced provincial Guidelines.
- Provide a report describing project consultation and the public involvement process including evidence of First Nations involvement.
- Integrate the Plan with the District of Sooke Official Community Plan (OCP), as appropriate.
- Develop the Terms of Reference for an ongoing Plan Monitoring committee, its structure and an independent assessment process.
- Develop the costs per household for plan implementation over the life of the plan.
- Work with Associated Engineering to coordinate integration (where necessary) of LWMP (Rainwater) with LWMP (Sewage).
- Assist District of Sooke staff with the provincial adoption process.

3 Schedule

Based on the Stage 2 and 3 ToR and additional tasks listed above, it is likely that the Stage 3 LWMP (Wastewater) could be completed before the Stage 2 and 3 LWMP (Rainwater). Downstream Environmental Consulting Ltd. has suggested that the schedule for project completion has been set at approximately one year from signing the contract in early May 2008. The long project timeline is a result of public consultation requirements and lengthy bylaw development and adoption processes. However, the completion date of May 2009 may have to be extended due to

the high rate of staff changes at the District of Sooke, e.g. the recent resignation of the Director of Engineering.

4 Budget

The budget for completing Stage 2 and 3 LWMP (Rainwater) is approximately, $ 110,000. As of October 8th, 2008, approximately 23% of the work had been completed and 23% of the budget had been expended. At this point, it is assumed that the funds will be adequate and that the project will come in on budget.

APPENDIX A – Terms of Reference for the Stage 2 and 3 LWMP (Stormwater)

District of Sooke
Liquid Waste Management Plan (Stormwater), Stages 2 & 3

TERMS OF REFERENCE

Prepared For: The District of Sooke

Prepared By: Downstream Environmental Consulting Ltd.

Date: April 21, 2008

District of Sooke
Liquid Waste Management Plan (Stormwater), Stage 2

TERMS OF REFERENCE

Background

The District of Sooke has completed construction of sewage collection and treatment facilities to service the core area of the community. This work was undertaken as part of a provincially mandated Liquid Waste Management Plan (LWMP).

Running in parallel with this LWMP (Sewage) in 2006, the District of Sooke commenced work on a separate component of the same LWMP for Stormwater. A consultant was engaged by the District of Sooke to undertake the Stage 1 activities which resulted in the development of three documents:

- District of Sooke, Liquid Waste Management Plan (Stormwater), Stage 1 Technical Support Document, November 28, 2006
- District of Sooke, Liquid Waste Management Plan (Stormwater), Stage 1 November 28, 2006
- District of Sooke, Liquid Waste Management Plan (Stormwater), Stage 1 Summary of the Public Involvement Process, September 13, 2007

The Technical Support Document investigated twenty two tasks identified in the Stage 1 Terms of Reference and the Stage 1 Plan provides a summary of the findings. Both documents are available on the District of Sooke website and were prepared to meet Province of British Columbia expectations for the process, content and delivery of a LWMP (Stormwater), Stage 1.

The LWMP (Stormwater), Stage 1 received provincial Ministry of Environment approval in a letter dated February 7, 2008. In that letter the province also approved the District's request to combine stages 2 & 3 of the Stormwater Plan. The province also requested that the final sewage and stormwater plans be submitted "as one package"

The District of Sooke is now moving forward with the development of a LWMP (Stormwater), Stages 2 & 3. These Terms of Reference (ToR) have been prepared to meet provincial expectations for the process, content and delivery of a LWMP (Stormwater), Stages 2 & 3. Provincial guidelines require that the ToR must be prepared in consultation with the Regional Environmental Protection Manager. This has been done and all issues identified in a letter from the province dated February 7, 2008 have been incorporated into these ToR. The guidelines also require that the ToR be reviewed by the Advisory Committee(s).

Introduction

Development within the District of Sooke continues to increase, as does the human influence on the land, watercourses and related features, and the marine coastline. The way in which

stormwater is managed will have direct effects on the health of the natural environment and the costs to build and operate municipal infrastructure.

In British Columbia, the *Community Charter* has vested the responsibility for drainage to municipal government. With the statutory authority for drainage, local governments can be held liable for downstream impacts associated with changes to both volume and rate of flow that result from upstream changes to drainage patterns. Senior government can also hold municipal governments responsible for downstream impacts from contaminants carried by stormwater flows. The *Charter* enables local governments to be proactive in implementing stormwater management solutions that are more comprehensive than past practices.

The provincial *Environmental Management Act* allows municipalities to develop Liquid Waste Management Plans (LWMP's) for approval by the Minister of Environment. The ministry has prepared *Proposed Revised Guidelines for Preparing Liquid Waste Management Plans* and has stated that these guidelines be used during Plan development. LWMP's are created by local governments under a public process in cooperation with the Province. The implementation of a LWMP (Stormwater) will result in enhanced protection for the environment, public health and well being.

There is a clear link between the land use planning required of the District of Sooke in the *Community Charter* and the LWMP process. The District's *Official Community Plan* (OCP) is a statement of objectives and policies regarding future land use. The LWMP (Stormwater) will minimize the adverse environmental impacts from the implementation of the OCP and ensure that development is consistent with Provincial objectives. The final LWMP (Stormwater), will be a written record of the community of Sooke's decisions and plans for the management of stormwater and will likely be adopted into the District of Sooke OCP.

In British Columbia, watershed management planning has gained widespread acceptance by local governments and environmental agencies to describe a comprehensive approach to stormwater planning. The purpose of watershed management planning is to provide a clear picture of how to proactively apply land use planning tools to protect property and aquatic life, while at the same time accommodating land development and population growth. The District of Sooke's LWMP (Stormwater) will be developed with the eventual goal of becoming a comprehensive watershed management plan.

LWMP (Stormwater), Stage 2 – Plan Development

The District of Sooke Liquid Waste Management Plan (Stormwater), Stages 2 & 3 will be consistent with provincial objectives and principles of sustainability. The consultant will manage Plan development using the five guiding principles identified in *Stormwater Planning: A Guidebook for British Columbia (May 2002).* These five principles are located in the Guidebooks Executive Summary. The entire document can be accessed from the Ministry's website at:
http://www.env.gov.bc.ca/epd/epdpa/mpp/stormwater/stormwater.html

The final Plan will provide direction to ensure that:

- municipal stormwater infrastructure is developed in a manner that will result in healthy watercourses and a healthy near shore marine environment
- watershed based management approaches can be implemented to protect Sooke's 14 watersheds
- low impact development techniques are employed to maintain and where possible restore the pre-development hydrologic regime of urbanized and developing watersheds
- biological and chemical contaminants do not enter stormwater flows in the first place (stormwater source control)
- a green infrastructure approach to stormwater management is taken to provide for cleaner air through well treed riparian zones and streetscapes.

The Plan will be developed with significant input from the municipal planning and engineering departments.

Development of the Plan will require the consultant to undertake detailed investigations of all 71 recommendations identified in the *District of Sooke Liquid Waste Management Plan (Stormwater), Stage 1* which is attached as (Appendix A) to these ToR. More detailed background and information on the recommendations in the Stage 1 Plan can be found in the *District of Sooke Liquid Waste Management Plan (Stormwater), Stage 1, Technical Support Document* available on the District website. The Technical Support document contains a large number of links to helpful information sources used in development of the Stage 1 Plan.

For each of the 71 recommendations the consultant will develop implementation strategies and identify where possible, the:
- lead agency and support agencies responsible for implementation
- human, financial and other resources required
- potential funding sources
- primary contact for each task
- implementation schedule

In addition to the above requirements, the consultant will complete the following two projects in their entirety:

1) Stormwater Quantity - Update the District of Sooke Subdivision and Development Standards Bylaw to ensure the following recommendations from the LWMP (Stormwater), Stage 1 are addressed: Recommendations A1 through A8 inclusive; B2, B7; D1, D2; E1, E2, E3; G6; H2; and L3.

2) Stormwater Quality - Work with the CRD and supply all necessary support and direction to District of Sooke staff during the municipal process to adopt a comprehensive stormwater quality protection bylaw and associated regulatory codes of practice.

Implementation strategies for some of the recommendations can be modelled on successful strategies employed in other jurisdictions. However some of the implementation strategies will require solutions specific to Sooke.

To ensure successful Plan implementation, the consultant will work closely with Sooke staff, advisory committees, the province and others to confirm that the activities laid out in the Plan are realistic and that the District of Sooke has, or can obtain the resources to implement the plan over time. The consultant will be required to attend a series of meetings to be held at key points throughout the plans development. The provincial *Proposed Revised Guidelines for Preparing Liquid Waste Management Plans* (Stages 2 & 3) should be used by the consultant to develop a schedule of meetings.

Public Consultation
Adequate public consultation during the plans development is essential. The consultant is required to design and carry out a comprehensive public involvement process. Section 4.4 of the updated Proposed Revised *Guidelines for Preparing Liquid Waste Management Plans*, provides the provincial expectations for this part of the process.

Integrate LWMP (Stormwater) with Sooke OCP
The District of Sooke Official Community Plan, adopted on August 12, 2002, includes a number of Objectives for the management of stormwater. The consultant is required to ensure these Objectives are included in the combined Stage 2 & 3 document.

Ensure First Nations Involvement
The consultant will ensure that both the T'Sou-ke and the Beecher Bay First Nation are included in the public consultation process and provided copies of all relevant information.

Plan Costs
The consultant must identify cost per user for the life of the Plan. The methods used to complete this task can be discussed and determined in consultation with provincial staff.

Plan Monitoring
The consultants will identify the need for an ongoing Plan monitoring committee to ensure the commitments in the Plan are implemented. The consultants will also recommend the Terms of Reference for the committee and its structure and that an independent assessment be undertaken five years after plan adoption by the province.

Plan Bylaws
Plan development will require amending some existing bylaws and preparing others. In some cases the need for additional bylaws will be identified in the Plan and draft outlines for these bylaws will be supplied.

District of Sooke Support
The District of Sooke will support the final Plan development by designating a project manager who will:

- manage the contract with the consultant

- reconvene the Advisory committee(s),
- arrange and chair meetings, develop agendas and action lists in consultation with the consultant
- arrange advertising for the Open House(s) in the Sooke Mirror;
- arrange space for the Open House(s);
- assist with the preparation of information for display and handout at the Open House(s);
- attend Open House(s)
- post up to date information on the planning process and draft plans on the municipal website;
- provide information on the planning process to the public at the municipal offices

E Appendix E - Discussion Paper No. 5 – On-Site System Management Options

DRAFT DISCUSSION PAPER NO. 5

District of Sooke
Stage 3 Liquid Waste Management Plan (Sanitary)

On-site System Management Options

Issued: October 8, 2008
Previous Issue: None

1 Background

The District of Sooke (District) is undertaking Stage 3 of its Liquid Waste Management Plan for submission to the Ministry of Environment. As part of this work, discussion papers are being developed and circulated to the District's Stage 3 Advisory Committee for their input and comments. Previous discussion papers have examined remaining treatment plant capacity and possibility of extending the sewer area, reconsidered effluent standard requirements for cluster and/or satellite developments, investigated how future development adjacent to Sooke Basin will be serviced, and developed a time table and budget to complete the on-going Rainwater Management Plan.

All on-site wastewater treatment systems require regular inspection and maintenance to operate effectively. The manner in which an on-site treatment system is taken care of will influence how long the system will last, how well it functions, and how well the environment is protected. In order for homeowners to avoid the inconvenience and cost associated with the repair or replacement of a prematurely failed on-site system, the treatment system should be regularly inspected and maintained to help the system perform well for many years. Typically, the frequency for septic tank clean outs and system inspections is in the two to five year time frame. A change in provincial legislation requires that new septic systems are regularly inspected and maintained, which requires implementation of a management program for at least the individual owner and, perhaps, on a District basis.

This discussion paper will provide an overview of on-site treatment system management options for the District and provide an example of an on-site treatment system management approach used by a nearby jurisdiction. This discussion paper will also present examples of public education programs implemented in other Canadian jurisdictions. A primer about how septic systems work is attached in Appendix A.

2 On-site Wastewater System Management Options

Under the Province's new Sewerage System Regulation, Vancouver Island Health Authority is not going to actively inspect any on-site systems. While the newer systems, developed under the new regulations, are supposed to have a regular inspection and maintenance program, the older systems developed before May 31, 2005 have no such requirement. As a result, the District may

elect to ensure that the on-site systems within its jurisdiction are actively and regularly inspected and maintained and, thereby, help to protect the environment from failed systems.

There are two management programs available to the District that can ensure on-site systems are regularly inspected and maintained. They include the following options:

- Privately-owned and maintained on-site systems and privately-operated inspection program ("Private-Private"), and
- Privately-owned and maintained on-site systems and publicly-operated inspection program ("Private-Public").

These on-site treatment management options, including an example of the Private-Private on-site management program adopted by the Capital Regional District (CRD), and potential costs for the District to implement an on-site treatment system management program will be discussed in greater detail in the following sections.

2.1 Privately-Owned and Maintained On-site Systems and Privately-Operated Inspection Program

This Private-Private management program would involve renewable operating licences. Under this management program, the District would issue licences upon proof of performance monitoring, pumping, or service by a qualified person. The licence would authorize the owner of the system to use the on-site system for a specified period, as long as the conditions on the licence were met.

If the system were not performing properly, the licence would not be issued until the problems are corrected. Property owners would be responsible for contracting and paying a specialist qualified by an industry association, e.g. the BC On-site Sewage System Association (BCOSSA), for the inspections. In addition, owners would pay a fee for the operating licence and would assume all costs associated with pump-outs, repairs, upgrades, or replacement of systems. At the end of the licensing period, the licence may be renewed based on the property owner paying a renewal fee and submitting an inspection report prepared by a qualified person indicating the system is performing properly.

Under this management program, the District's involvement would be enacted under a Regional District bylaw and would include the following:

- Development of licence conditions and reporting requirements,
- Mailings of licence requirements and application forms (possibly in a phased schedule),
- Receiving payments,
- Maintaining a database and file system,
- Enforcement activities (for failure to obtain licence, spot-checks on inspectors), and
- Licence renewals.

A public information program, i.e., educational pamphlets, advertising, and open houses would be used to initiate the program. Letters would be mailed to property owners explaining the program requirements, deadlines, fees, and penalties. The property owner would then be required to retain a qualified person to conduct an inspection of their system, typically once every three years, and prepare a report detailing the inspection results. The District would be required to determine the degree of the inspection. The inspections could include the following:

- A description of the on-site treatment and disposal system, including age of the system and number of occupants it normally serves.
- Uncovering the septic tank to measure the scum, sludge, and liquid level in the tank.
- Inspection of the general condition of the tank, outlets, distribution box, etc.
- Inspection of all mechanical parts, including pumps, valves, etc.
- A general site evaluation documenting evidence of any malfunction including lush vegetation, saturated ground surface, seepage, etc.
- A dye test, to assess leakage, at the discretion of the inspector.

Septic tank pump-outs would be required on a regular frequency, e.g. every three years, and possibly more frequently, depending on the occupancy of the residence. The property owner would then submit the inspection report with a licence application. If the property owner's system were non-compliant, there would be provisions for submitting the report with a plan and schedule to bring the system into compliance and a completion report.

Property access issues would not be an issue under this management concept because the property owner would be responsible for contracting the pump out and inspection. The District could also enact a bylaw permitting District staff to access private property to conduct spot checks of the inspection reports.

Disadvantages of this type of program include the following:

- Difficulty issuing permits if there are incomplete records of the system.
- Property owner has to take the responsibility to get an inspection done and submit an application.

One way to help ensure that the inspection is completed regularly would be to charge the property owner approximately one-third of the pump-out and inspection cost each year, plus an administration fee, on their annual property tax bill. Once the pump out and inspections were completed, the property owner would submit the inspection report and subsequently be given a rebate for the cost of the pump-out and inspection, less the administrative fees.

2.2 Privately-Owned and Maintained On-site Systems and Publicly-Operated Inspection Program

This Private-Public management program is similar to the first Private-Private one but differs on one major point: the District would provide the systematic inspection and pump-out of on-site systems. These inspections would be conducted by either District staff or an inspection company under contract to the District. System deficiencies would be noted and the property owner would be responsible for hiring a qualified person to complete any required maintenance or repairs. The property owners would be charged a service fee for the inspection and would assume all costs associated with required repairs, upgrades, or system replacement.

The District would be involved in the following:

- Developing the permit conditions and reporting requirements,
- Carrying out or contracting out the pump outs and inspections,
- Mailing licences, or development of correction orders,
- Receiving payments,
- Maintaining files and a database,
- Enforcing compliance, and
- Renewing permits.

The main drawback with this management program is opposition from residents toward District-authorized inspectors entering their property. This may be resolved by enacting a bylaw that provides inspectors with the right to access private property for the sole purpose of conducting an inspection of the on-site wastewater treatment system.

Another drawback with this type of management scenario is the timing of fee collection for the licence. For this option, there is no obvious trigger, such as the submission of a licence application. This issue could be addressed by sending an invoice after an inspection takes place. However, if the system is in non-compliance, the property owner may be disgruntled and less likely to pay the inspection fee. A better way to resolve this issue would likely be to put the inspection fee directly on the annual property tax notice.

2.3 Capital Regional District

The CRD had to include on-site management as part of its Liquid Waste Management Plan. After considering the management options, the CRD opted for the Private-Private on-site system management program for Saanich, Colwood, Langford and View Royal, i.e., the municipalities with septic systems in their Core Area Liquid Waste Management Plan area.

A bylaw (CRD Bylaw 3479) requires owners of a basic septic tank and disposal field (Type 1 system) to pump out their tanks by the end of 2010 and every five years thereafter. Owners of a package treatment plant (Type 2 or Type 3 system) will be required to have their system maintained by a professional by the end of 2009 and annually thereafter to ensure it continues to

function properly and does not cause or contribute to a health hazard. The homeowners will have to keep their receipts and send them in to the CRD as proof of compliance. Those who have pumped out their tanks since 2007 or later, and who can show proof to the CRD, will be able to pump five years from their last pump-out date.

See the CRD's website for more information: http://www.crd.bc.ca/wastewater/septic/onsite.htm.

2.4 Management Program Costs

As an example, conceptual budgets for implementing Private-Private and Private-Public on-site treatment management programs were developed. These conceptual estimates were based on servicing of 625 septic tanks. The conceptual budget allows for a senior District staff person to oversee the septic system management program and assumes that the bulk of program coordination, education program, record keeping and billing would be done by other District staff on a part-time basis. Conceptual budgets for the implementation of Private-Private and Private-Public on-site treatment management programs are presented in Table 1 and Table 2, respectively.

As shown in Tables 1 and 2, the estimated administrative cost for implementing the Private-Private or Private-Public management programs for 625 septic systems were in the range of $25 to $32 per year per septic system. When the pump out and inspections are added, the annual cost rises to the $120 and $125 range.

The CRD has implemented an annual parcel tax of approximately $25 to $30 that will be charged to owners of on-site sewage systems to administer their Private-Private management program. This fee is intended to cover maintenance of a database to keep track of where systems are, new installations, and connections to sanitary sewer. It will also include notification to homeowners when their due-date is approaching and follow up enforcement costs with those who are not complying.

2.5 Summary of Management Options

In order to ensure that on-site treatment systems are functioning properly, the District could choose to implement an on-site wastewater treatment system management program. Two different management programs were discussed in the previous sections. The fundamental differences between the management programs are the delegation of responsibilities for inspection and maintenance; ownership of the systems (i.e., the property owner or the District); and whom the on-site system inspector is employed by (i.e., the property owner or the District).

No matter which program is selected, the following are required to ensure the management program is successful:

- An education program for on-site system users,
- Inspection and maintenance of on-site systems at regular intervals, and

Table 1 Example Estimated Cost of Implementing a Private-Private Septic Tank Management System

Item	Units	No. of Units	Cost per Unit	Extension
Administration Staff (approx. 1 hr per week)	FTE	0.03	$ 70,000	$ 2,000
Program Staff - 0.5 hr per client coordinating pump-outs, record keeping, etc.	FTE	0.06	$ 50,000	$ 3,000
Dedicated Computer (annual allowance)	Annual	1	$ 1,000	$ 1,000
Monitoring Program (including retreiving samples and record keeping)	Sampling	16	$ 300	$ 4,800
Education Program	FTE	0.06	$ 50,000	$ 3,000
Stationary and Supplies (annual allowance)	Annual	1	$ 1,000	$ 1,000
Number of clients	Septic Systems	625		
Postage for mailouts (notices, bills, etc) (2 per year)	Stamps	1250	$ 1	$ 650
			Sub-total =	$ 15,450
			Total Admin Cost Per System =	**$ 25**
Cost of Clean-out/inspection - via contracted services	Clean out	1	$ 225	$ 225
Frequency of inspection	Years	0.333		
Nominal average cost per year - cleanout and inspection				**$ 75**
Sub-total cost per lot per year (admin cost plus pump out cost)				**$ 100**
Contingency Allowance	Percent	20	$ 20	**$ 20**
Total Cost per year per client				**$ 120**
			Say	**$120 to $125**

Tank inspection info:

No. of pump-outs/inspections per year (average)	Tanks	209
Ave. No. of inspections per month (April to October inclusive)	Tanks	30
Ave. No. of inspections per week	Tanks	7.5
Ave. No. of inspections per day	Tanks	1.5

Table 2 Estimated Cost of Implementing a Private-Public Septic Tank Management System

Item	Units	No. of Units	Cost per Unit	Extension
Administration Staff (approx. 2 hr per week)	FTE	0.05	$ 70,000	$ 3,500
Program Staff - 1 hr per client coordinating pump-outs, record keeping, etc.	FTE	0.12	$ 50,000	$ 6,000
Dedicated Computer (annual allowance)	Annual	1	$ 1,000	$ 1,000
Monitoring Program (including retreiving samples and record keeping)	Sampling	16	$ 300	$ 4,800
Education Program	FTE	0.06	$ 50,000	$ 3,000
Stationary and Supplies (annual allowance)	Annual	1	$ 1,000	$ 1,000
Number of clients	Septic Systems	625		
Postage for mailouts (notices, bills, etc) (2 per year)	Stamps	1250	$ 1	$ 650
			Sub-total =	$ 19,950
			Total Admin Cost Per System =	**$ 32**
Cost of Clean-out/inspection - via contracted services	Clean out	1	$ 200	$ 200
Frequency of inspection	Years	0.333		
Nominal average cost per year - cleanout and inspection				**$ 67**
Sub-total cost per lot per year (admin cost plus pump out cost)				**$ 99**
Contingency Allowance	Percent	20	$ 20	**$ 20**
Total Cost per year per client				**$ 119**
			Say	**$120 to $125**

Tank inspection info:

No. of pump-outs/inspections per year (average)	Tanks	209
Ave. No. of inspections per month	Tanks	30
(April to October inclusive)		
Ave. No. of inspections per week	Tanks	7.5
Ave. No. of inspections per day	Tanks	1.5

- A record of each on-site system, in a database and its condition, pump-out history, etc.

3 Public Education Programs

Public education programs have been implemented by jurisdictions to assist home owners with proper care and maintenance regimes for their on-site treatment systems. Examples of public education programs developed by the CRD, the Regional District of Nanaimo (RDN), and Nova Scotia Environment are presented below.

3.1 Capital Regional District

The CRD has developed a public education program titled “Septic Savvy”. The public education program includes a brochure and website, which provides homeowners access to information via scheduled workshops, a household information kit, and video clips on septic system maintenance. The Septic Savvy household kit contains information on the following topics:

- Septic Savvy brochure,
- Caring for your septic system,
- Protect your drainfield,
- Alternative cleaning products,
- Water conservation, and
- Septic system location and maintenance record.

An example of the Septic Savvy brochure can be found at the following website: http://www.crd.bc.ca/wastewater/septic/documents/septic_savvy.pdf and in Appendix B, attached. Additional educational material, including links to the Septic Savvy Household Information Kit, can be found at the CRD’s septic system website http://www.crd.bc.ca/wastewater/septic/index.htm.

3.2 Regional District of Nanaimo

The RDN has opted to not enter into an on-site system management program at this time. Instead, the RDN has developed a septic system public education program titled “SepticSmart”. A key component of the RDN public education program was the development of the SepticSmart Residential Household Information Kit. The information kit contains handouts with information on the following topics:

- Septic system care tips,
- How a septic system works,
- Septic system maintenance,
- Water conservation,
- Greener cleaners,
- A maintenance record, and

- A list of materials that should not be put down household drains as a non-adhesive decal for placement on a mirror, toilet, sink or bathtub.

Having recently completed the information kit, the RDN will be sending out a news release informing the public of the availability of the kit, conducting open houses at the Greater Nanaimo and French Creek Pollution Control Centres, and performing workshops on septic system care.

The RDN also provides information about septic systems on the following website: http://www.rdn.bc.ca/cms.asp?wpID=1159. The website provides an overview of septic systems, operation and maintenance tips, and website links to the new Sewerage System Regulation and additional information sources related to septic tank installation and ownership. The "SepticSmart" information is planned for addition to their website along with Frequently Asked Questions and upcoming workshops. Completion of the website is expected near the end of 2008.

3.3 Nova Scotia Environment

Nova Scotia Environment has developed a public education program for on-site sewage disposal systems. The information can be accessed directly from Nova Scotia Environment's webpage http://www.gov.ns.ca/nse/water/wastewater.asp. The website contains links to technical documents as well as information for homeowners, including booklets titled "Before You Construct an On-site Sewage System" http://www.gov.ns.ca/nse/water/docs/OnSiteSewageConstruction.pdf and "Taking Care of Your Home Sewage Disposal System" http://www.gov.ns.ca/nse/water/docs/OnSiteSewageMaintenance.pdf.

3.4 Education Program Development Costs

Development of the public education program for the CRD, with an estimated 27,000 septic systems, was approximately $50,000. Development of a public education program for the RDN, with an estimated 12,000 septic systems, was approximately $25,000 funded via an increase in septage tipping fees. Costs for implementation of the public education program for the District will be influenced by the size and intensity of the program and the targeted number of homeowners.

4 Summary

This discussion paper presented two suggested approaches for the District to consider with respect to the management of on-site treatment systems – Private-Private and Private-Public. The costs of administering these management programs are relatively similar, with costs estimated between approximately $25 and $32 per septic system, not including the actual inspection and pump-out costs. To supplement an on-site management program, the CRD has developed a public education program. The RDN has opted to not have an on-site system management program and instead will rely on an education program to help ensure proper on-site system operations. This approach disseminates educational information on septic system care and maintenance regimes to homeowners via brochures, homeowner information kits (both hardcopy and electronic versions),

public workshops, and web-based media. Costs for implementation of a public education program by the District would be influenced by the extent of the program and the number of homeowners targeted.

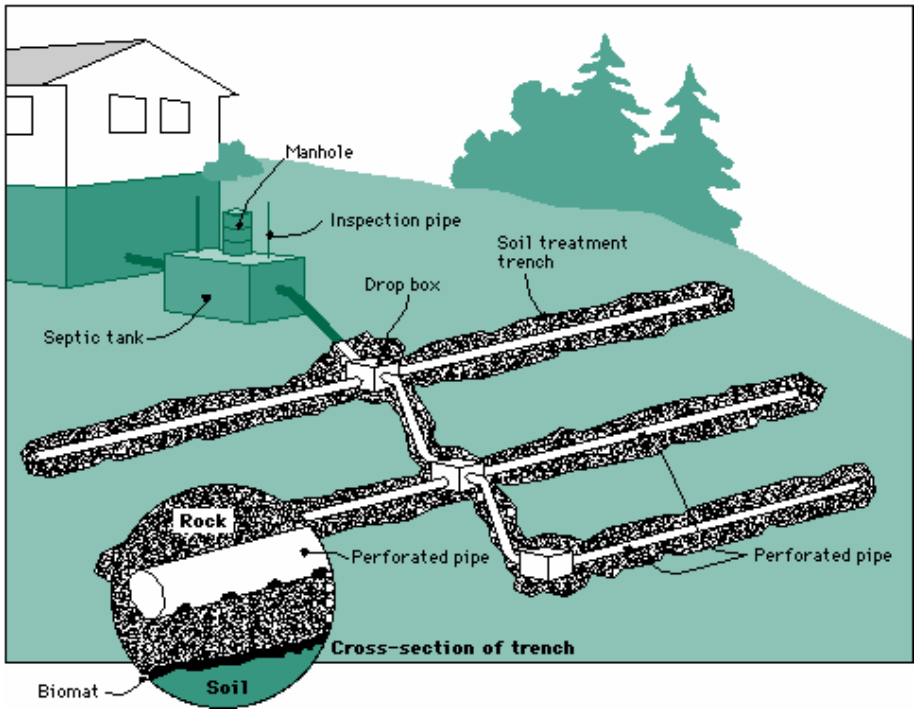
APPENDIX A - Types of On-site Treatment

Under the new 2005 Sewerage System Regulation, there are three types of on-site treatment, Type 1, Type 2 and Type 3. The following sections describe these treatment types.

A.1 Type 1 Systems

According to the Sewerage System Regulation, a Type 1 system consists of treatment by septic tank only. A properly functioning septic system receives all the wastewater created from household use (including toilets, showers, sinks, dishwasher, washing machine, etc.), treats the wastewater to a primary level, and returns the treated effluent to the groundwater. A conventional septic system is composed of a septic tank and a soil filter called an absorption field.

Figure A-1
Septic Tank and Absorption Field



The purpose of the septic tank is to separate liquid from solids and to provide some breakdown of organic matter in the wastewater. A septic tank is a buried, watertight container made from concrete, polyethylene or fibreglass. The size of the septic tank will depend upon the size of the house (number of bedrooms) and household water use.

As wastewater from the house enters the septic tank, its velocity slows, allowing heavier solids to settle to the bottom and lighter materials to float to the surface. The accumulation of settled solids at the bottom of the tank is called “sludge” while the lighter solids (greases and fats), which form a mass on the surface, is called “scum”. Anaerobic bacteria, which are always present in wastewater, digest some of the organic solids in the tank. Clarified wastewater in the middle of the tank flows by displacement into the leaching bed for further treatment in the soil layer.

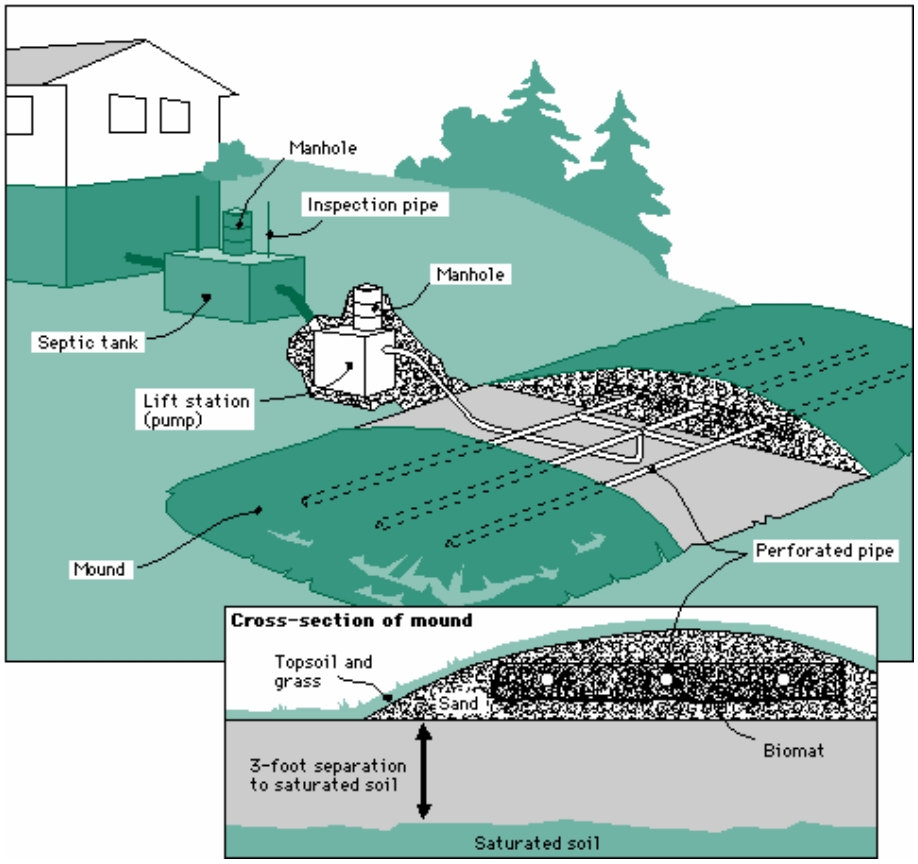
The partially treated wastewater from the septic tank flows into the absorption field. The absorption field is typically a network of perforated plastic distribution pipes laid in sandy-gravel trenches over a layer of soil. Typically, the soil layer must be a minimum depth above the ground water table or a restrictive layer such as bedrock or clay, and have certain permeability (absorptive capacity). Conducting a percolation test can test the soil permeability. A percolation test determines the absorption rate of soil by observing how quickly a known volume of water dissipates into the subsoil of a drilled hole of known surface area. In general, sandy soil will absorb more water than soil with a high concentration of clay or where the water table is close to the surface.

Older septic systems may have been constructed with clay tiles instead of plastic pipes, while new systems may use plastic chambers to replace the gravel trenches and perforated piping. The actual size, design and layout of the absorption field is based upon the volume of sewage generated, the absorptive capacity of the underlying soils, and the depth to the high groundwater table or limiting/ restrictive layer. Wastewater can flow by gravity from the septic tank to the distribution pipes, or where required, can be collected in a pump chamber and pumped to an absorption field at a higher elevation.

The absorption field is a soil filter, which uses natural processes to treat the wastewater from the septic tank. Contaminants in the wastewater include solid and dissolved organic matter (carbon compounds), nutrients (nitrogen and phosphorus), beneficial bacteria and fungi, and harmful bacteria and viruses. A slime layer of bacteria, called a “biomat” layer, forms at the bottom and sidewalls of each distribution trench; and it is in this layer where much of the treatment occurs. The soil bacteria, which perform the treatment, require oxygen to function, therefore; the absorption field must be installed in soils that are not saturated by surface water run-off or a high groundwater table, and should not be paved or covered over with hard surfaces.

The absorption field soil must be the right type to retain the wastewater long enough for treatment to occur, while at the same time allowing the wastewater to infiltrate into the ground. In cases where there is a sufficient separation from either the high groundwater table or bedrock, the network of drainage piping is installed directly in the native soil or in imported sand if the permeability of the native soil is not suitable. This is called a conventional system. In cases where the high groundwater table or bedrock is close to the surface, the absorption field must be raised so that there is sufficient unsaturated soil under the drainage piping. This is called a raised bed system or a mound system.

Figure A-2
Raised Bed or Mound System



A.2 Type 2 Systems

Type 2 systems are on-site secondary wastewater treatment systems that produce effluent consistently containing less than 45 mg/L of total suspended solids and having a five-day biochemical oxygen demand of less than 45 mg/L. Type 2 systems are generally used where site conditions make it impractical or even impossible to install a conventional septic system such as: high groundwater table, bedrock, poor soil conditions (i.e. clay, silt, till) or inability to meet the setback distances from surface water, wells or property boundary lines.

In these cases, an aerobic treatment technology is often used. These treatment technologies are proven technologies used to treat the wastewater to a higher level (secondary and tertiary) than a septic tank, permitting the treated effluent to be discharged into a much smaller area than is required for treatment by a conventional absorption field.

Aerobic treatment technologies typically have three components: a settling tank (this may be smaller than a conventional septic tank), the aerobic treatment unit, which removes much of organic matter from the wastewater, and a dispersal system, which is often a small absorption field.

Aerobic treatment technologies rely on aerobic micro-organisms to break down the organic matter in the wastewater. In order to optimize treatment, the treatment units either include a material to support the growth of micro-organisms (called attached growth media), or a continuous mixer or aerator to keep micro-organisms in suspension (called suspended growth). Many technologies utilize either an air pump or blower to provide oxygen to the micro-organisms, while some technologies are designed as “trickling filters”, where effluent is dosed onto an unsaturated media and the micro-organisms use the oxygen in the air, which surrounds the media.

The treated effluent is typically discharged into a small absorption field, although there are alternative methods in some jurisdictions including pressure distribution systems near the soil surface or even discharge to surface waters.

A.3 Type 3 Systems

Type 3 systems are advanced secondary treatment systems that can meet an effluent standard of less than 10 mg/L BOD, 10 mg/L TSS and less than 400 fecal coliform forming units per 100 mL. The treatment process would either include Type 2 treatment followed by some type of fabric or sand filter or a membrane bioreactor, both followed by disinfection (either chlorination / dechlorination or ultraviolet (UV) irradiation). The effluent from such systems would be very clean and clear. Type 3 treatment systems are relatively expensive to build and operate. Type 3 treatment systems would typically only be used in very unique situations with a sensitive receiving environment or a high water table that would make a Type 1 or Type 2 system impossible.

APPENDIX B - Example On-site System Education Material

Contact Information

Vancouver Island Health Authority
Please contact or visit your nearest office for further information or assistance:

Saanich
201 711 Vernon Avenue
Victoria, BC V8X 5A7
Phone (250) 475-1858
Fax (250) 475-5130

Saanich Peninsula
2170 Mt. Newton X Road
Saanichton, BC V8M 2B2
Phone (250) 544-2426
Fax (250) 544-2425

Western Communities
204 2780 Millstream Road
Victoria, BC V9B 3S6
Phone (250) 478-0523
Fax (250) 478-9363

Sooke
2215 Otter Point Road
Sooke, BC V0S 1N0
Phone (250) 642-1602
Fax (250) 642-1609

Visit us on the web!
www.viha.ca/mho
www.crd.bc.ca/es/septic

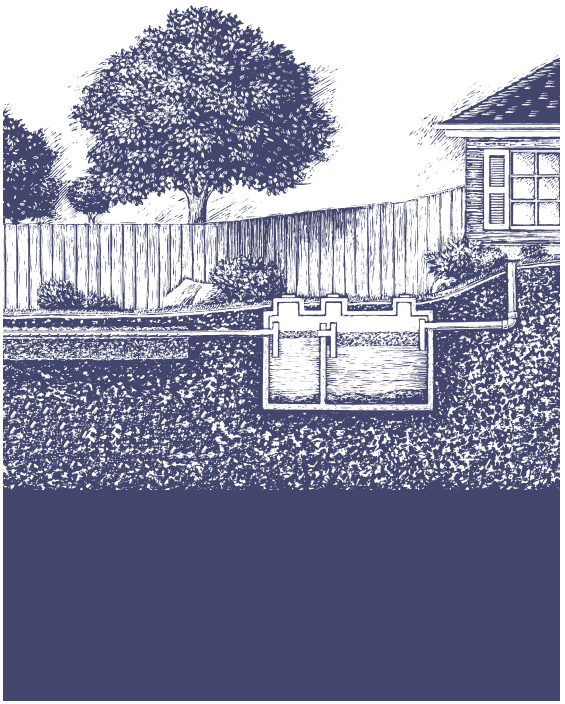
VANCOUVER ISLAND health authority

CRD Environmental Services

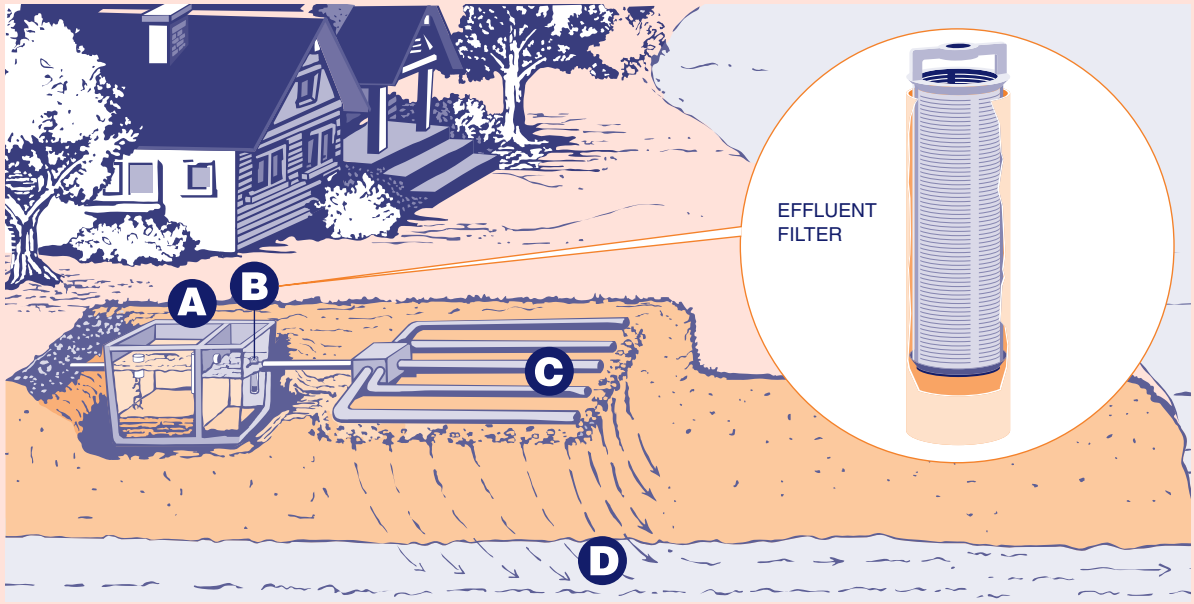
This paper contains 30% post-consumer recycled fibre and is printed with vegetable based inks
DS Rx 07/03 5M

Septic Savvy

How to Care for Your Residential Septic System



A Basic Gravity Flow Sewage Disposal System



Septic Systems Explained

Properly functioning and maintained septic systems are an excellent means of treating sanitary wastewater within the confines of a given property. They are usually used for homes that are not connected to a public sewer line. Although many different types of systems are used, the principles are generally the same.

In a typical gravity flow septic system, wastewater from sinks, tubs, showers and toilets flushes out of the house into a septic tank that separates and stores any solid particles that either settle to the bottom or float to the top. (A) In the case of a package treatment plant type of system, a tank called a "trash tank" may precede the treatment plant. Beneficial bacteria help to break down the accumulated solids in these tanks, but eventually the solids build up and must be pumped out.

The partially treated wastewater then flows from the tank through an effluent filter (B) and into a distribution box. The box evenly divides the discharge into a network of pipes that lie buried in trenches in the drainfield. (C) Small holes in the pipes allow the wastewater to seep into the soil. Natural filtration and further bacterial action remove any remaining particles in the wastewater. When it finally reaches the water table, the wastewater has been treated and cleansed. (D)

When septic systems work properly, they are efficient, inexpensive to maintain and safe for people and the environment; if they fail, they can cause odours, water pollution and major expense to repair.

When wastewater doesn't get the full treatment, contaminants can leach into groundwater that supplies our wells or drain directly into lakes, streams or our own backyard!

Care and Maintenance

Signs of a failing septic system:

- Sewage surfacing over the drainfield (especially after a heavy rainfall)
- Lush, green growth or soggy areas over the drainfield
- Slow or backed up drains, toilets or sinks
- Sewage odours around the property

Neglect or abuse of your septic system can cause it to fail. A failed system can:

- Cause a serious health threat to your family, neighbours and pets,
- Pollute ditches, streams, lakes, the ocean or groundwater, and
- Be very expensive and difficult to repair.

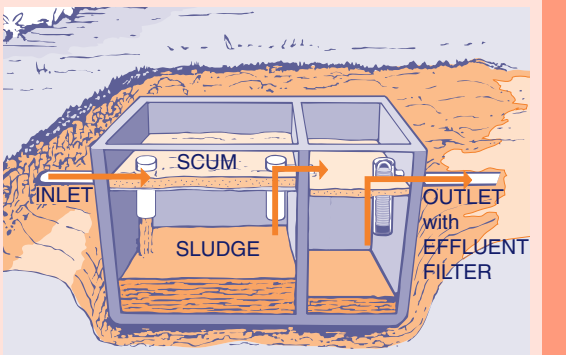
The most common causes of septic system failure are:

- Improper maintenance of the septic tank (or package treatment plant),
- Excessive water intrusion into the drainfield area, and
- Overloading or abuse of the system with solids or chemicals.

The key to a healthy, long lasting septic system is to protect the tank and drainfield from becoming clogged with solids. This means:

- Checking your system annually to ensure that it's working properly,
- Having your septic tank pumped every 3-5 years (every year if you have a package treatment plant) or more often depending on use,
- Conserving water,
- Diverting surface water away from your drainfield, and
- Keeping harmful material out of the system.

A Typical Septic Tank Installation



The Do's and Don'ts

Do's

- Learn and record the location of your septic system, including tank and drainfield.
- Check for proper operation of your system annually. Allow easy access to the system for monitoring and maintenance. Keep a record of inspections, pumping and other maintenance.
- Install an effluent filter if you don't already have one. Special units are available for retrofitting to an existing tank. Solids will be kept out of your drainfield, and your system will last longer.
- Have a service contract for package treatment plants, and attend to repairs promptly.
- Arrange for an inspection the next time you have your system pumped. A septic system professional should inspect the entire system: tank, tees or baffles, drainfield, distribution box, effluent filter and pump chamber (if applicable).
- Arrange for another inspection in three to five years and a pump-out at a frequency appropriate to your own particular circumstances, as determined by the inspector.

The Do's and Don'ts

Do's (cont'd)

- Practice water conservation and limit the number of high water use activities done consecutively or at the same time. For example, spread out laundry washings over the week and avoid running the dishwasher at the same time. Also, use water sparingly when watering over or near your drainfield.
- Use alternatives to toxic cleaners and chemicals around your home. Harmful chemicals can kill the beneficial bacteria in your septic tank, causing you to have your tank pumped more often. They can also be carried to your drainfield and into watercourses or drinking wells.
- Take hazardous wastes to disposal depots. Contact the CRD Hotline at 360-3030 or email hotline@crd.bc.ca for more information.
- Plant grass over your drainfield rather than trees or shrubs.
- Be aware that human wastes from people on medication (eg. antibiotics) can affect the performance of your septic system and may require more frequent pumping of your tank. Leftover medications should be returned to your pharmacy.
- Contact your local Vancouver Island Health Authority office for more information and advice (see contact information).

Don'ts

- Don't allow toxic cleaners or chemicals to be flushed into your septic system. Use environmentally friendly alternatives where possible. Never allow potential poisons to get into your drainfield, including paint, solvents, antifreeze, fuels, oil, pesticides or herbicides. They upset the beneficial bacteria in your system and can leach into groundwater and cause serious health or environmental concerns.
- Don't discharge water softeners into a package treatment plant.
- Don't use septic tank "starters" or similar products. They can do more harm than good. Allow the natural bacteria to work on their own.
- Don't use granular drain cleaners. Only a small amount can kill all of the beneficial bacteria in your system, leading to rapid build-up of solids or drainfield clogs.
- Don't use a garburator to dispose of food waste and other solids. Your tank will fill up prematurely and require more frequent pumping.
- Don't park, drive, pave or put heavy objects or machinery over your drainfield. This can compact the soil, crush pipes and keep air from getting into the ground - all of which can lead to system failure.
- Don't plant trees or shrubs in the drainfield area. Their roots can damage or plug the drainfield pipes. Grass is ideal.
- Don't allow roof drains, perimeter drains or surface water runoff from driveways and slopes to discharge into your tank or onto the drainfield. Excessive water can flood the system and cause premature failure.
- Don't use your toilet or drains as a trash can. Cooking grease, fats, cigarette butts, disposable diapers, sanitary napkins, hair, plastics, lint, metal, rubber, coffee/tea grounds and cat litter should all be kept out of your septic system and disposed of in the garbage.
- Don't make repairs or alterations to your septic system without consulting your Vancouver Island Health Authority office. If you're considering an addition to your home, you should contact the authority for advice on whether your septic system will need upgrading.

F Appendix F - Discussion Paper No. 6 – Investigation of Beneficial Reuse of Septage and Treatment Plant Biosolids

DRAFT DISCUSSION PAPER NO. 6

District of Sooke
Stage 3 Liquid Waste Management Plan (Sanitary)

Investigation of Beneficial Reuse of Septage and Treatment Plant Biosolids

Issued: October 8, 2008
Previous Issue: None

1 Introduction

There are two types of wastewater treatment being used in the District of Sooke area: septic tanks or biological secondary treatment systems. Septic systems only function properly if the septic tank is periodically emptied of its accumulated solids, e.g. once every three to five years. Similarly, a biological secondary wastewater treatment plants only function properly if biological solids are wasted from the system on a regular basis, i.e. daily. As a result, both types of wastewater treatment that are used in the District of Sooke create biological solids that need disposal or, if possible, beneficial reuse.

In the case of septic systems, trucked liquid waste companies are typically contracted to pump the solids out of the septic tanks. These "solids" are mostly liquid and need some treatment prior to disposal or reuse. At present, there is one facility in the Capital Regional District (CRD) area that takes septic tank pump-out wastes. This is SPL Wastewater Recovery Center Inc (995 Henry Eng Place, in Langford (250) 391-7892). At SPL, the septic tank trucks discharge to a treatment facility through a screening system to remove the course solids and debris. This material goes to the Hartland Avenue landfill. The remaining screened solids (still mostly liquid) go to a dissolved air flotation (DAF) unit that separates the organic solids from the liquid. These solids are then further dewatered using an inclined screen press. The resulting solids are trucked away for disposal at the Hartland Avenue landfill. The liquid stream from the DAF goes to an on-site biological treatment facility to bring the organic strength of the liquid down below a biochemical oxygen demand of 300 mg/L so that it can be released to the CRD sewer system. The solids from this treatment system are recycled to the DAF unit.

There are two sizes of biological secondary treatment in the District of Sooke: small and medium. The small units include those serving individual properties, including Sooke Harbour House, and stratas not connected to the Sooke sewer system. These small systems would waste their excess biological solids to aerated holding tanks for subsequent removal by septage trucks and treatment at the SPL treatment facility. In contrast, the one medium-sized secondary treatment facility, the District of Sooke wastewater treatment plant, currently operated by EPCOR, wastes its excess biological solids to an aerobic digester within the plant. After a sufficient period of aerobic digestion, e.g. 20 to 30 days (on average), biosolids are drawn from the digestion tanks and dewatered through the use of a centrifuge. These dewatered biosolids, also known as "cake", are hauled away. To date, these solids have been disposed of at the CRD's Hartland Avenue landfill.

Based on the above, all of the biological solids from the treatment of wastewater in the District of Sooke end up at the CRD's Hartland Avenue landfill. The Ministry of Environment would prefer if these organic solids were used in some beneficial way instead of simply being disposed. The remainder of this discussion paper examines these options.

2 Options for Beneficial Reuse of Wastewater Biosolids

Based on other work that Associated Engineering has been involved with, there are a number of options that could potentially be used to divert wastewater biosolids. These options include the following:

- Land application for agriculture and/or silviculture (forestry)
- Composting for subsequent use in the landscaping, agricultural or forestry sectors
- Use as a renewable energy fuel to offset the use of fossil fuels

These options are discussed further in the following sections.

2.1 Land Application

Organic solids from wastewater treatment, either stabilized aerobically or anaerobically, have characteristics similar to a slow release low strength fertilizer. In addition, because of the relatively fibrous nature of the biosolids, they can be used to add tilth to the soil, i.e. adding microscopic channels between soil particles that allow moisture, air and roots to better penetrate into the soil. As a result, wastewater biosolids can be successfully added to agricultural and forestry soils to improve the growth rate of the crops or trees that are planted or previously have been planted in that soil. Organic solids from wastewater treatment are primarily used in BC to reclaim mining sites, including gravel pits, and improve the growth of trees in reforested areas. The application of biosolids to land is controlled by the BC Organic Matter Recycling Regulation. Controlling factors for application of biosolids to land include metals and nutrients. In a community like the District of Sooke, with a relative lack of industry, including metal platers, the likelihood of the biosolids having a metals issue (i.e. concentrations of heavy metals that are too high) is extremely unlikely.

In a recent study for the CRD, it was determined that, technically, there is a large potential land base within the CRD and Cowichan Valley Regional District that could potentially be used for land application of wastewater treatment biosolids. However, this study was not concerned about the politics of land application.

There are concerns about the long term viability of land application of biosiolds based on the potential that biosolids contain chemicals of "emerging concern", i.e. endocrine disrupting chemicals and pharmaceutical and personal care products. The science on this topic is not conclusive, since the soils to which the biosolids are applied will have an influence on the fate of

these chemicals and soils vary from site to site. Since there is some uncertainty, some communities have decided to not land apply biosolids.

2.2 Composting

Composting is an aerobic process that mimics what happens naturally to organics, such as leaves or vegetable wastes, if natural processes are left to degrade them over a long period of time. Composting speeds the process up by making sure that the process is kept aerobic (not always true in nature). For treatment plant organic solids (raw sludges or partially digested biosolids), they would be dewatered into the 20% to 26% dry solids range and then mixed with wood chips or chipped woody debris (e.g. from land clearing or a yard waste chipping program). The woody material is used as a carbon source to help balance the nitrogen and phosphorus in the wastewater solids, as well as to provide and maintain air passages during the composting process.

The composting process usually occurs in two phases, a primary aerobic phase and a secondary curing phase. The primary aerobic phase typically lasts about 21 days and involves monitoring and controlling temperatures (typically kept in the 55 to 60°C range to kill pathogens) by aerating and/or watering the mixture. Aeration can be through physical turning using purpose-built compost turners, such as that shown in Figure 1 or through aeration pipes or channels laid beneath the compost piles. Curing usually is done for four to six weeks and involves aeration and mixing, but typically at much longer intervals than in the primary aerobic phase.

Figure 1
A Typical Straddle-type Compost Turner
(photo courtesy of Frontier Industries)

Composting of raw biosolids has been quite successful in BC. On Vancouver Island, the Comox Valley Pollution Control Centre composts its raw wastewater sludges at a Pidgeon Lake facility,

using an enclosed static aeration system for the primary composting phase and a more open (but covered) aerated curing phase. The resulting product, known as SkyRocket™, is well accepted by gardeners and landscapers as a top soil replacement and/or supplement. Similarly, the Cities of Penticton, Kelowna and Vernon all compost their raw treatment plant sludges to create a well accepted, marketable product. The Cities of Kelowna and Vernon recently constructed a new composting facility south of Vernon that treats the raw sludges from both cities' treatment plants to produce "OgoGrow". Typically, demand is more than supply.

Setting up a composting facility is not without its challenges. The most important of these is siting the facility so that there are few, if any, neighbours who might complain about odours. Composting can be odourous and, as a result, development of such a facility needs to have a substantial budget available to put in odour control measures, including enclosing the primary composting process in a building (such as at the Comox Valley facility) and then treating the foul air from the building through some form of treatment, e.g. biofilters, wet-chemical scrubbers, ionizers or thermal destruction units. Other issues include on-site leachate management, i.e. control of liquids that drain off the composting piles, so that they do not contaminate local groundwaters or surface waters.

The Comox Valley composting facility services a sewered population of approximately 40,000 people in the Courtenay and Comox area. The facility was constructed in 2004 in advance of recent capital project cost increases. Based on recent cost information from the facility, the debt portion is approximately $310,400/yr and the net operating and maintenance costs after revenues from sales of "Skyrocket" are about $366,200 for a total annual cost of $676,600/yr. Divided by annual capacity of 5500 m^3 of 22% dry solids dewatered biosolids, the cost is about $123/$m^3$. With the added cost of new construction in today's economy, this figure could be higher. To put the Comox Valley costs in context, a cubic metre of dewatered biosolids is about 1 tonne and the current tipping fee at the CRD's Hartland Avenue landfill for "Pumpings from septage treatment facilities containing residual sludge" is $150 per tonne.

The District of Sooke could potentially develop their own composting facility to handle their biosolids. However, the scale would be very small and the cost to properly construct and operate the facility would be high both in real dollars and dollars per tonne processed, i.e. higher than the $123/ m^3 of dewatered cake example above. As an alternative, there are at least two commercial composting facilities that could potentially be contracted to take and treat the District of Sooke's biosolids. These could include the Fisher Road composting facility (Fisher Road Recycling, 1355 Fisher Road RR#2 Cobble Hill, BC V0R 1L0) in the Cowichan Valley Regional District and the International Composting Corporation facility (981 Maughan Road, Nanaimo, BC V9X 1J2) in the Duke Point industrial park in the City of Nanaimo. Obviously both of these options would involve a good deal of trucking as well as the tipping fees that these facilities would need to treat the biosolids. The fees would likely be in the same order of magnitude as the existing landfill tipping fees.

2.3 Use as a Fuel

Wastewater treatment organic solids, either raw undigested or digested biosolids, have a calorific value, i.e. they will burn if they are dry enough. Dried biosolids have a calorific value similar to that of a soft brown coal, i.e. about 17,000 kilo Joules per kilogram (kJ/kg). Furthermore, wastewater treatment biosolids are ultimately derived from food, which in turn was derived from atmospheric carbon dioxide either directly (grains, vegetables and fruit) or indirectly (animals or fish). As a result, wastewater treatment biosolids can be considered a renewable fuel source that does not contribute to a carbon footprint when burned. As such, dried biosolids can be used as a coal substitute and should be eligible for greenhouse gas credits.

For large scale treatment plants, such as those currently operated by Metro Vancouver or will be operated by the CRD, there is a possibility of using dried biosolids as a fuel source for cement kilns, which are major users of fossil fuels and, as such, major greenhouse gas emitters. However, for a small community like the District of Sooke, the logistics are not practical for a cement company to consider.

However, there are some potential options for smaller treatment plants. These could include a vacuum-based plate and frame biosolids and sludge dewatering process known as DryVac™ and a solid fuel boiler. The DryVac could be used to raise the solids content of the dewatered cake into the 75% to 90% range, which is well above the autogenic point (around 34%) where the biosolids will burn on their own without an auxiliary fuel source. The resulting product would look like flakes of pressed sawdust and could be fed into a solid fuel boiler that would both destroy the biosolids and produce a steam or hot water for local heating, e.g. local heating loop serving several buildings. There would be some ash that would need disposal at a landfill but the quantities would be down to the 5% to 10% range of the original biosolids cake.

3 Summary and Conclusions

Currently all of the sludges and/or biosolids from the septic systems, Type 2 on-site treatment plants and the District of Sooke's wastewater treatment plant all end up at the CRD's Hartland Avenue landfill. While this is an expedient solution, it does not provide any beneficial reuse except perhaps through the creation of some additional landfill biogas. More direct beneficial reuses include options like land application to forestry lands, composting with chipped land clearing debris and dewatering and drying followed by use as a fuel in a solid fuel boiler.

There has been some resistance in the CRD towards land application of biosolids. However, in other areas of BC, land application of treated biosolids has been used to beneficially rehabilitate mining sites, including gravel pits. As a result, the potential for land application could be pursued further in the future.

The District of Sooke could compost its wastewater treatment plant biosolids on its own site (to be determined). However, it is likely better to contract the composting out to an existing or new

Vancouver Island-based commercial composting facility such as the Fisher Road facility in the Cowichan Valley Regional District.

Dried dewatered biosolids can be used as a coal substitute or “green” fuel. Large treatment plants would produce enough biosolids that major users, such as cement manufacturers, would be interested. At the scale available to the District of Sooke, the most likely green fuel option would be dewatering and drying the biosolids followed by a solid fuel boiler for steam or heat production.

Based on the above options, the most expedient beneficial reuse options would likely be to truck the dewatered biosolids from the wastewater treatment plant to an existing composting facility or to land application on in a reforestation situation.

G Appendix G - Discussion Paper No. 7 – Priority Assessment for Sewering Catchment Areas in the District of Sooke

DISCUSSION PAPER NO. 7

District of Sooke
Stage 3 Liquid Waste Management Plan (Sanitary)

Priority Assessment for Sewering Catchment Areas in the District of Sooke

Issued: August 11, 2009
Previous Issue: March 13, 2009

1 Introduction

During the Stage 3 Liquid Waste Management Plan (LWMP) process, the District of Sooke's (the District) Stage 3 (Sanitary) Advisory Committee noted that there should be some way of developing a prioritized list of areas for future inclusion in the District's Specified Sewer Area (SSA). This list was to be based on both economics (cost) and environmental concerns. Since the economics of adding these areas had previously been examined in Discussion Paper No. 1 (DP1) "Considerations for Adding New Sewered Areas to the District of Sooke Specified Sewer Area", the only factor that was missing was a representation of environmental concerns. After determining which type of environmental data might be available, it was decided that surface water fecal coliform concentration data could serve as a surrogate for the level of environmental concern. The implication of using this data is the higher the fecal coliform concentration, the stronger the indication that there were problems with the septic systems in the area. Areas with higher fecal coliform concentrations should be ranked higher on the prioritization list, at least based on potential environmental concerns.

The purpose of this discussion paper was to assess priority areas for future inclusion in the District's SSA using estimated costs of sewering catchment areas and surface water fecal coliform concentrations as a surrogate for level of environmental concern.

2 Approach

The methodology for this assessment was based on the use of the same District catchment areas as defined by Stantec in an earlier report and presented in DP1.

2.1 Economic Ranking

To develop the economic ranking for each catchment area, the procedure for scoring was relatively straight forward. The estimated costs for sewering each catchment area were presented previously in DP1. The total cost of future sewering and wastewater treatment for each of the catchment areas per single family equivalent (SFE) was extracted from DP1. This cost for each catchment area was scored on the basis of the lowest cost and the highest cost, with the lowest cost scored as 10 and the highest cost scored as zero. Costs in between these two extreme values were scored on a linear scale between the high value and the low value. The economic data and scoring used for each catchment area are presented in Table 1 (data were extracted from Table 1 in DP1).

Table 1 - Catchment Area Scores and Ranks Based on Economics and Environmental Concerns

Catchment	Baseline SFE	Expansion SFE	Overall Cost	Catchment Cost Per New SFE	Total Shared Cost Per New SFE	Cost of Treatment	Total Cost Per New SFE	Ranking Based on Cost*	Economics Score** (10=lowest $, 0=highest $)	Measured Avg. Fecal Coliforms (n/100 mL)	Rank Based on Fecal Coliforms***	Environmental Score**** (10=highest count, 0=lowest count)	Sum of Scores (Even Weight)	Rank Based on Sum of Scores	Sum of Scores (1:2 Weighting)	Rank Based on Weighted Score(1)	Sum of Scores (2:1 Weighting)	Rank Based on Weighted Score(2)	Sum of Ranking from 3 Weightings	Rank Based on Sum of Rankings
Sooke Road	1,209	2,034	$ 2,019,500	$ 170	$ 3,092	$ 3,583	$ 6,844	5	7.6	0	7	0.0	7.6	10	7.6	10	15.3	7	27	10
West Coast Road	1,448	3,797	$ 6,258,700	$ -	$ 59	$ 3,583	$ 3,641	1	10.0	0	7	0.0	10.0	**3**	10.0	6	20.0	**1**	10	**3**
Helgesen Road	272	335	$ -	$ -	$ 3,092	$ 3,583	$ 6,674	3	7.8	0	7	0.0	7.8	8	7.8	8	15.5	**5**	21	8
Gravity to WWTP	824	1,082	$ 1,151,000	$ 2,287	$ 59	$ 3,583	$ 5,928	2	8.3	0	7	0.0	8.3	7	8.3	7	16.6	**4**	18	**4**
Westside Sooke	0	0	-	-	-	-	-	-	-	0	7	0.0	-	-	-	-	-	-	-	-
Erinan	0	375	$ 2,198,350	$ 5,862	$ -	$ 3,583	$ 9,445	8	5.7	0	7	0.0	5.7	12	5.7	12	11.4	11	35	12
Addition to West Coast Road	0	55	$ 651,000	$ 11,836	$ 829	$ 3,583	$ 16,248	13	0.7	0	7	0.0	0.7	14	0.7	14	1.4	14	42	14
Addition to Helgesen Road	0	0	-	-	-	-	-	-	-	0	7	0.0	-	-	-	-	-	-	-	-
Foreman Heights Catchment Area	0	1,812	$ 4,277,875	$ 2,361	$ 829	$ 3,583	$ 6,772	4	7.7	0	7	0.0	7.7	9	7.7	9	15.4	6	24	9
Whiffin Spit North	0	316	$ 2,502,325	$ 6,124	$ 59	$ 3,583	$ 9,766	9	5.5	6,900	2	7.5	13.0	**1**	20.5	**1**	18.5	**2**	4	**1**
Whiffin Spit West	0	243	$ 2,231,950	$ 9,185	$ 59	$ 3,583	$ 12,826	11	3.2	0	7	0.0	3.2	13	3.2	13	6.5	13	39	13
Whiffin Spit South	0	239	$ 3,240,650	$ 13,559	$ 59	$ 3,583	$ 17,200	14	0.0	127,032	1	10.0	10.0	**4**	20.0	**2**	10.0	12	18	**4**
Silver Spray (Needs Whiffin Spit South and West PSs)	0	0	-	-	-	-	-	-	-	5,027	3	7.3	-	-	-	-	-	-	-	-
Kaltasin	0	1,310	$ 5,493,075	$ 4,193	$ 1,381	$ 3,583	$ 9,157	7	5.9	1,822	4	6.4	12.3	**2**	18.7	**3**	18.3	**3**	8	**2**
Saseenos (needs Kaltasin)	0	955	$ 7,546,875	$ 7,902	$ 1,381	$ 3,583	$ 12,866	12	3.2	1,051	5	5.9	9.1	**5**	15.0	**4**	12.3	10	19	6
Goodridge (needs Saseenos)	0	237	$ 787,500	$ 3,323	$ 1,381	$ 3,583	$ 8,287	6	6.6	0	7	0.0	6.6	11	6.6	11	13.1	8	30	11
Grouse Nest (needs Goodridge)	0	900	$ 5,609,905	$ 6,233	$ 1,381	$ 3,583	$ 11,197	10	4.4	120	6	4.1	8.5	6	12.6	**5**	12.9	9	20	7
Total	**3,753**	**13,690**																		

Notes:
Cost data are based on the analysis presented in Discussion Paper No. 1 "Considerations for Adding New Sewered Areas to the District of Sooke Specified Sewer Area" (August 2009)
* - Low cost is a good thing and should score high
** - Score is based on lowest cost = 10 points, highest cost = zero points; continuous linear scale
*** - High fecal coliform counts and should score high
**** - Score is based on log10 of highest count = 10 points, log10 lowest count = zero points; continuous linear scale
Highlighting indicates top 5 catchment area scores
No Expansion SFEs were outlined for Westside Sooke, Addition to Helgeson Road and Silver Spray catchment areas. These areas were not considered further for SSA expansion.

Of note, no Expansion SFEs were identified for Westside Sooke, Addition to Helgesen Road, and Silver Spray catchment areas for future SSA expansion. Therefore, no expansion costs would be associated with these catchment areas in the future and were not considered further within the SSA priority assessment.

2.2 Environmental Ranking

Surface water fecal coliform data were provided by the District. The fecal coliform data were provided for various stream tributary discharge points around Sooke Harbour and Sooke Basin; major water courses, such as Alderbrook Stream, Ayum Creek, Saseenos/Lannon Creek, and Sooke River; and marine sampling for Sooke Inlet, Sooke Harbour and Sooke Basin. Water quality data were generally for the years between 1997 and 2008, but available data varied for each sampling site. The scope of this assessment was limited to the use of fecal coliform data between 2006 and 2008, which was considered to be representative of recent District sewering activities. Microbial source-tracking (MST) data were also provided by the District for one sampling site in Kaltasin catchment area and for one sampling site in Silver Spray catchment area. MST samples were collected once in Summer 2008 and once in Winter 2009 for both sites.

To develop the environmental ranking for each catchment area, scoring was based on a correlation of fecal coliform concentrations to the same catchment areas as outlined in DP1 for cost. The maximum fecal coliform concentration for each sampling site between 2006 and 2008 within the catchment area was extracted and ultimately averaged. This approach resulted in an average maximum fecal coliform concentration for each catchment area over the 2006 to 2008 period. The fecal coliform concentration data used for each catchment area are presented in Table 1. Only MST data for 2008 sampling events were used for comparison to the available fecal coliform concentration data.

To develop the environmental scoring, the fecal coliform concentrations for each catchment area were scored on the basis of the lowest concentration and the highest concentration. The lowest concentration was scored as 0, which represented the lowest level of environmental concern, and the highest concentration was scored as 10, which represented the highest level of environmental concern. However, the range of fecal coliform concentrations between each catchment area was very large, i.e., between 0 coliforms/100 mL and 127,000 coliforms/100 mL. In order to accommodate this large difference in fecal coliform concentrations, it was decided to base the scoring on the logarithm (base 10) of the concentration, i.e. 100 coliforms/100 mL would have a log10 equal to 2 whereas 10,000 coliforms/100 mL would have a log10 equal to 4, and so on. The environmental scoring was based on these log10 results, with the catchment areas with the highest logarithm scoring a value of 10 and those catchment areas with the lowest logarithm, i.e. zero coliforms, scoring a value of 0. The results of the environmental scoring are shown in Table 1.

2.3 Overall Ranking

To develop the overall economic and environmental ranking, the economic score and the environmental score for each catchment area were added together for a total score. The ranking for each catchment area was based on this total score. Three weighting scenarios were developed to evaluate the overall economic and environmental ranking for each catchment area. The weighting scenarios evaluated included the following:

- Even weighting for economics and environmental concerns, i.e. 1:1 economics:environmental concerns,
- 1:2 weighting for economics:environmental concerns and
- 2:1 weighting for economics:environmental concerns.

3 Results

For each weighting scenario, the catchment areas with the five highest scores were highlighted for priority for sewers. The results of this priority assessment are presented in Table 1 and are summarized below. Notably, no future SFE expansion was outlined for Westside Sooke. Addition to Helgesen Road and Silver Spray catchment areas, as outlined in DP1, and these catchment areas, were not considered further in the SSA priority assessment.

3.1 Economic Ranking

Based on economics alone, the five areas with the lowest costs and, therefore, the easiest from a cost-wise perspective for future SSA inclusion, would be densification of West Coast Road, Gravity to WWTP, and Helgesen Road catchment areas followed by additions to the Foreman Heights catchment area and densification of Sooke Road catchment area. Based on economics alone, the areas with the lowest priority for inclusion in the SSA would be Whiffin Spit South, Addition to West Coast Road, and Saseenos catchment areas.

3.2 Environmental Ranking

Based on environmental concerns alone, the five catchment areas with the highest fecal coliform concentrations in their surface waters and, therefore, the highest assumed environmental concern for future SSA inclusion were Whiffin Spit South, Whiffin Spit North, Silver Spray, Kaltasin, and Saseenos. MST data for Kaltasin did not show the presence of *Bacteroides*, an indicator bacteria used to distinguish between human and other mammal fecal sources. MST data were not available for Silver Spray in 2008.

3.3 Overall Ranking

For even weighting between economics and environmental concerns, the five highest ranked catchment areas were Whiffin Spit North, Kaltasin, West Coast Road, Whiffin Spit South, and Saseenos.

For a 1:2 economics:environmental concerns weighting, which emphasizes the potential environmental concerns of the catchment area more than the economics, the five highest ranked catchment areas were Whiffin Spit North, Whiffin Spit South, Kaltasin, Saseenos, and Grouse Nest.

For a 2:1 economics:environmental concerns weighting, which emphasizes the economics of the catchment area more than the environmental concerns, the five highest ranked catchment areas were West Coast Road, Whiffin Spit North, Kaltasin, Gravity to WWTP, and Helgesen Road.

Finally, to confirm the consistency of the results of the rankings, the rankings from each of the three weighting scenarios (1:1, 1:2 and 2:1) were added together. This sum of rankings from the three weighting scenarios were then ranked, with the lowest total score highlighting the most likely candidate for future inclusion in the SSA. The five catchment areas with the highest overall economic and environmental rankings were Whiffin Spit North, Kaltasin, West Coast Road, Gravity to WWTP, and Whiffin Spit South. These results were relatively consistent with the other ranking results.

3.4 Limitations

Economics of sewering the catchment areas was based on conceptual design cost estimates developed previously for the District. These cost estimates should be considered preliminary and will be refined as the project proceeds towards detailed design. Cost-sharing was applied among new SFE users where possible to distribute infrastructure costs among the appropriate catchment areas.

Fecal coliform data were assumed to be an indicator of fecal contamination from septic tanks, i.e., human fecal material. The fecal coliform bacteria data used in this analysis are found in the intestines of humans and other mammals. At present, there are limited data for the District that permit differentiation between fecal sources from humans and fecal sources from other mammals. As a proactive measure towards addressing this limitation of the data, the CRD has recently included some MST sampling as part of its overall water quality sampling program in the District. As additional MST data are collected in the future, these data can be used to better define the source(s) of fecal coliform contamination to District water bodies.

4 Summary

This discussion paper assessed priority areas for future inclusion in the District's SSA using economics (costs) of sewering catchment areas and surface water fecal coliform concentrations as a surrogate for level of environmental concern. A ranking approach that quantified both economics and environmental concern for each catchment area was developed.

Based on the results of this analysis, it is clear that Whiffin Spit North and Kaltasin catchment areas are good candidates for future inclusion in the SSA. Densification of West Coast Road and Gravity

to WWTP catchment areas are also feasible options for the District due in part to the relatively low cost for the addition of new SFEs. Whiffin Spit South catchment area is also a good candidate for inclusion in the SSA by the District. An option for the District is to sewer the entire Whiffin Spit catchment area, including Whiffin Spit North, Whiffin Spit South, and Whiffin Spit West. This approach could permit cost sharing for more equalized costs per new SFE in the Whiffin Spit catchment areas.

Priority catchment areas for sewering and inclusion within the SSA will be subject to change based on available economic information; improvements in environmental information, such as the collection of additional fecal coliform and MST data for catchment areas; and the priorities of the District.

KB/lp

H Appendix H - Draft Bylaws Resulting from Stage 3

DRAFT

DISTRICT OF SOOKE
BYLAW NO. _____

A Bylaw to Regulate the Discharge of Wastewater Treatment Plant Effluent in the District of Sooke

Whereas:

A. The District of Sooke has previously established a Sewer Specified Area (SSA) under Bylaw No. _____.

B. Not all areas within the District of Sooke will be connected to the SSA.

C. Some areas might be served by treatment plants not owned by the District of Sooke.

D. The Liquid Waste Management Plan approved by the Minister of Environment contains a commitment by the District to protect the water quality in Sooke Harbour and Basin and all drainage courses that lead to these water bodies, including, but not limited to, Sooke River;

E. By Section ___ of the District Regulation BC Reg. _____, the District of Sooke has been granted the authority of a municipality under Section 8(3)(i) of the *Community Charter* to regulate, prohibit and impose requirements in relation to public health and has authority to regulate for the maintenance of sanitary conditions under Section 523 of the *Local Government Act*;

F. The District of Sooke wishes to regulate and impose requirements in relation to the discharge of wastewater treatment effluent within the District, for the purpose of preserving public health and maintaining sanitary conditions;

NOW THEREFORE, the Council of the District of Sooke in open meeting assembled enacts as follows:

Application

This regulation applies to the discharge of wastewater treatment plant effluent for areas not connected to the District of Sooke's Sewer Specified Area (SSA).

Definitions

A word or phrase defined in the Sewerage System Regulation (the SSR), BC Reg. 326/2004 and the BC Municipal Sewage Regulation (the MSR) BC Reg. 129/99, has the same meaning where used in this Bylaw.

"Owner" means the owner of the treatment plant and/or holder of the MSR or SSR registration for the treatment plant serving an area not included in the SSA.

"**Effluent**" means the liquid resulting from the treatment of municipal sewage;

"**Municipal Sewage**" means domestic sewage, wastewater or municipal liquid waste originating primarily from residences, but may include contributions from

(a) holding tanks in recreational vehicles, boats and houseboats,

(b) commercial, institutional and industrial sources, and

(c) inflow and infiltration;

"**Open Marine Waters**" means ocean waters other than embayed marine waters or water for which, in the opinion of the manager, the flushing action is considered adequate;

"**Embayed Marine Waters**" means:

(a) marine waters located on the shore side of a line up to 6 km long drawn between any two points on a continuous coastline, or located so that the maximum width of sea access by any route is less than 1.5 km wide, or

(b) marine waters in which flushing action is considered to be inadequate by a manager;

"Ground" means land not covered by water.

"MSR" means the Municipal Sewage Regulation, BC Reg. 129/99

"SSR" means the Sewerage System Regulation, BC Reg. 326/2004.

"Onsite Sewage System" means a system for treating domestic sewage that is a Type 1 System, a Type 2 System or a Type 3 System.

"Treatment Method" means a treatment method for domestic sewage classified as Type 1, Type 2 or Type 3 where

(a) Type 1 is treatment by septic tank only,

(b) Type 2 is treatment that produces an effluent consistently containing less than 45 mg/L of total suspended solids and having a 5 day biochemical oxygen demand of less than 45 mg/L, and

(c) Type 3 is treatment that produces an effluent consistently containing less than 10 mg/L of total suspended solids and having

i. a 5 day biochemical oxygen demand of less than 10 mg/L, and

ii. a median fecal coliform density of less than 400 Colony Forming Units per 100 mL.

Discharge of treated effluent

1. An owner must:

(a) Not discharge sewage or treated effluent directly into to any water course that drains into Sooke Harbour, Basin or Bay.

2. An owner must either:

(a) Discharge treated effluent to ground through an approved means, with proper set-backs, under the MSR or SSR or

(b) Discharge treated effluent to open marine waters, i.e. Sooke Bay outside the embayed waters 6 km definition line, via a deep ocean outfall approved under the MSR process.

Enforcement

A bylaw enforcement officer is authorized at all reasonable times to enter onto any property for the purposes established by sections 268 and 314.1 of the *Local Government Act* and any other authority to enter property granted in the *Local Government Act*, the *Community Charter* or another Act in accordance with subsections 16(1) to (5) of the *Community Charter* or other conditions of entry if any, set out in the *Local Government Act*, the *Community Charter* or another Act.

Offence

A person who contravenes a provision of this Bylaw commits an offence and is liable on summary conviction to a fine not exceeding Twenty Thousand ($20,000.00) Dollars.

Citation

This Bylaw may be cited for all purposes as "Treated Effluent Discharge Bylaw, 2009".

DRAFT

DISTRICT OF SOOKE
BYLAW NO. _____

A Bylaw to Establish a Service to Develop and Implement a Management Program for Onsite Sewage Systems

WHEREAS:

A. The District of Sooke may establish a service that Council considers necessary or desirable for all or part of the District;

B. The District of Sooke Liquid Waste Management Plan approved by the Minister of Environment contains a commitment by the District to develop and implement a management program for onsite sewage systems;

C. By Section __ of the District Regulation BC Reg. ____, the District of Sooke has been granted the authority of a municipality for public health under Section 8(3)(i) of the *Community Charter* to regulate, prohibit and impose requirements in relation to public health and has the authority to regulate for the maintenance of sanitary conditions under Section 523 of the *Local Government Act*;

D. The District of Sooke wishes to establish a service to prevent the environmental degradation and public health risks associated with poorly maintained onsite sewage systems;

E. The consent of the participants within the District of Sooke is not required under Section 24(7) of the *Environmental Management Ac*t; and

NOW THEREFORE, the Council of the District of Sooke in open meeting assembled enacts as follows:

Service

The service established by this Bylaw is the Onsite Sewage System Service (the "**Service**") for the purpose of developing and implementing a management program for the onsite sewage systems in the Service Area.

Boundaries

The boundaries of the Service Area are coterminous with the boundaries of the District of Sooke (the "**Service Area**").

Participating Areas

The "Participating Areas" are the District of Sooke.

Cost Recovery

As provided in Section 803 of the *Local Government Act*, the annual cost of providing the Service shall be recovered by one or more of the following:

(a) property value taxes imposed in accordance with Division 4.3 of Part 24 of the *Local Government Act*;

(b) parcel tax imposed in accordance with Division 4.3 of Part 24 of the *Local Government Act*;

(c) fees and charges imposed under Section 363 of the *Local Government Act*;

(d) revenues raised by other means authorized by the *Local Government Act* or another Act;

(e) revenues received by way of agreement, enterprises, gift, grant or otherwise.

Maximum Requisition

In accordance with Section 800.1(1)(e) of the *Local Government Act*, the maximum amount that may be requisitioned for the cost of the Service is the greater of:

(a) _____ Thousand and _____ dollars ($_____) dollars; or

(b) an amount equal to the amount that could be raised by a property value tax rate of $0.____ per One Thousand dollars ($1,000.00) which, when applied to the net taxable value of the land and improvements within the Service Area, will yield the maximum amount that may be requisitioned under Section 806.1 of the *Local Government Act* for the Service.

Apportionment of Costs

Costs of the Service shall be apportioned among the Participating Areas as follows:

(a) the cost of the Service apportioned to a Participating Area shall be equal to the number of parcels having onsite sewage systems within that Participating Area as a percentage of the total number of parcels having onsite sewage systems within the Service Area.

(b) within a Participating Area, costs shall be apportioned among all properties, other than those parcels that are not connected to an onsite sewage system.

Citation

This Bylaw may be cited for all purposes as "Management of Onsite Sewage Systems Service Establishment Bylaw, 2009".

DRAFT

DISTRICT OF SOOKE
BYLAW NO. _____

A Bylaw to Regulate the Maintenance of Onsite Sewage Systems in the District of Sooke

Whereas:

A. The Council of the District of Sooke has established a service to develop and implement a management program for onsite sewage systems under Bylaw _____, cited as "Management of Onsite Sewage Systems Service Establishment Bylaw, 2009", for the purposes of maintaining, promoting or preserving public health or maintaining sanitary conditions;

B. The District of Sooke Liquid Waste Management Plan approved by the Minister of Environment contains a commitment by the District to develop and implement a regulatory management program for onsite sewage systems;

C. By Section ___ of the District Regulation BC Reg. _____, the District of Sooke has been granted the authority of a municipality under Section 8(3)(i) of the *Community Charter* to regulate, prohibit and impose requirements in relation to public health and has authority to regulate for the maintenance of sanitary conditions under Section 523 of the *Local Government Act*;

D. The District of Sooke wishes to regulate and impose requirements in relation to the use of onsite sewage systems within the District, for the purpose of preserving public health and maintaining sanitary conditions;

NOW THEREFORE, the Council of the District of Sooke in open meeting assembled enacts as follows:

Application
This regulation applies to the maintenance of onsite sewage systems.

Definitions

A word or phrase defined in the Sewerage System Regulation (the Regulation), BC Reg. 326/2004 has the same meaning where used in this Bylaw.

"**Authorized person**" means a person who qualifies as a registered practitioner or professional under the Sewerage System Regulation.

"**Maintenance**" includes an onsite review of an Onsite Sewage System to determine that the system continues to function properly in a manner that does not cause or contribute to a health hazard.

"**Maintenance plan**" has the same meaning as in the Regulation.

"**Maintenance records**" means a written record kept by the owner of all maintenance activities under Section 3 of the Regulation.

"Regulation" means the Sewerage System Regulation, BC Reg. 326/2004.

"Onsite Sewage System" means a system for treating domestic sewage that is a Type 1 System, a Type 2 System or a Type 3 System.

"**Type 1 System**" means an onsite sewage system classified as Type 1 under the definition of 'treatment method' in the Regulation.

"**Type 2 System**" means an onsite sewage system classified as Type 2 under the definition of 'treatment method' in the Regulation.

"**Type 3 System**" means an onsite sewage system classified as Type 3 under the definition of 'treatment method' in the Regulation.

Maintenance of Onsite Sewage Systems

An owner must:

(a) cause a Type 1 System on the owner's land to be pumped out and inspected on or before December 31, 2010; and

(b) thereafter cause the Type 1 System to be pumped out and inspected every five years.

An owner must:

(a) maintain a Type 2 System or Type 3 System according to the maintenance plan for the onsite sewage system; and

(b) where a Type 2 System or Type 3 System is located on an owner's land, cause the onsite sewage system to be maintained by an authorized person at least once per calendar year.

An owner must:

(a) retain records of all maintenance carried out on the onsite sewage system by the authorized person; and

(b) provide copies of the maintenance records within three (3) days of a request by the District of Sooke.

Enforcement

A bylaw enforcement officer is authorized at all reasonable times to enter onto any property for the purposes established by sections 268 and 314.1 of the *Local Government Act* and any other authority to enter property granted in the *Local Government Act*, the *Community Charter* or another Act in accordance with subsections 16(1) to (5) of the *Community Charter* or other conditions of entry if any, set out in the *Local Government Act*, the *Community Charter* or another Act.

Offence

A person who contravenes a provision of this Bylaw commits an offence and is liable on summary conviction to a fine not exceeding Two Thousand ($2,000.00) Dollars.

Citation

This Bylaw may be cited for all purposes as "Onsite Sewage System Maintenance Bylaw, 2009".

Appendix I - Liquid Waste Management Plan Monitoring Committee Terms of Reference

File No. 0540-20

TERMS OF REFERENCE

Council Adoption: *Draft LWMP AC*

Select Committee Name: **LIQUID WASTE MANAGEMENT PLAN MONITORING COMMITTEE**

Established: Council resolution *Insert date*

Purpose of Committee:

The purpose of the Liquid Waste Management Plan (LWMP or the "Plan") monitoring committee (the Committee) is to monitor the implementation of the approved LWMP (Sanitary and Rainwater) and develop strategies to mitigate issues related to implementation as they arise.

Members: Up to (11) voting members consisting of:

- Two (2) representatives from District of Sooke Development Services, Planning and Engineering;
- Director of Planning or designate;
- Representative from Local First Nations (T'Sou-ke First Nation and/or Beecher Bay);
- Ministry of Environment, Regional Environmental Protection Manager, or designate;
- Ministry of Community and Rural Development;
- Vancouver Island Health Authority;
- Environment Canada;
- District of Sooke sewage collection and wastewater treatment contractor; and
- At least two (2) members of the public at large chosen from:
    - the development community;
    - local environmental groups; and
    - local business and the general community.

Council Representative: Councillor as appointed by Council

Chairperson: The Committee will elect either a sitting member of the public or a member of the District's Development Services staff.

Term: At least one (1) year in accordance with Policy No. 1.4., *Committee Structure and Function Policy, 2006*

Staff Support: Engineering

Responsibilities of the Committee:

- Meet two (2) times per year or at the call of the Chairperson.
- Review Development Services reports on the status of the LWMP implementation. These staff reports will provide information on plan activities including scheduling and budgets.
- Assist District staff in identifying potential funding opportunities, developing partnerships and encouraging pilot projects in all aspects of the Plan implementation.
- Review the terms of reference for contracts with agencies involved in implementation and/or operation of aspects of the Plan.
- Assist District staff to ensure that municipal and private projects are in compliance with all aspects of the Plan.
- Develop recommendations to be forwarded to the District Council.
- Review terms of reference for additional work to maintain the implementation schedule.
- Review an annual LWMP implementation and status report developed by District staff for subsequent submittal to the Ministry of Environment.

Budget: Engineering

J Appendix J - Stage 3 Advisory Committee Meeting Minutes

DISTRICT OF SOOKE

Liquid Waste Management Plan (Sanitary), Stage 3 Advisory Committee

Meeting # 1 – June 26, 2008
4:30 PM – Council Chambers
2205 Otter Point Road

Committee Members Present:

Dave McClimon – Community Representative
William Norton - Community Representative
Councillor Ron Dumont
Chris Jensen – Municipal Infrastructure Resource Officer, Ministry of Community Services
Blake Medlar - Government and Compliance Section Head, Ministry of Environment
Cindy Walsh – Senior Environmental Protection Officer, Ministry of Environment
Julia Brydon - Pollution Prevention Coordinator, Environment Canada
Rob Miller – Team Leader, Downstream Environmental Consulting Ltd.
Rick Lloyd – Team Engineer, RCL Consulting Ltd.
Lehna Malmkvist – Team Biologist, Swell Environmental Consulting
John Reynolds - EPCOR

District Staff
Darcey Kohuch - Director of Engineering
Laura Byrne – Engineering Technician
Marlaina Elliott, Director of Planning
Lisa Urlacher, Council Clerk
Al Fontes, Engineering Technologist

Consultant
Dave Forgie – Team Leader, Associated Engineering Ltd.

Absent

Peter Law - Ecosystem Biologist, Ministry of Environment
Michael Riefman – Vancouver Island Health Authority
Mark Gauti – Land Manager, T'Sou-Ke First Nations

Information Only

Eric Lund - Juan de Fuca Electoral Area Director
Dave Drummond - CAO – Metchosin

Action

1. **Introductions**

The meeting began at 4:30 p.m. and Ms. Byrne welcomed and introduced the LWMP (Sanitary) Stage 3 Advisory Committee members.

2. **Approval of Agenda**

The agenda was approved as circulated

3. **Appointment of Chair**

Ms. Byrne was appointed chair.

4. **Advisory Committee –** Terms of Reference

The committee discussed how the committee will vote and make decisions – Majority Rules.

It was noted that he Ministry representative have no voting power.

The committee discussed the Province requirements for minimum lots under 2500 m^2 and the Vancouver Island Health Authority. The committee identified the need for a representative from the Vancouver Island Health Authority. **Staff**

5. **Presentation – Liquid Waste Management Plan (LWMP)**

Mr. Forge provided and submitted a powerpoint presentation of the following:

- LWMP process
- Stage 2 Background
- Stage 2 Conclusions
- Ministry of Environment Approval
- Tasks for Stage 3

During the presentation the committee discussed future development with satellite systems. It was noted that outside the core area developments must meet the requirement of the Ministry of Environment. A proactive approach could be that the District of Sooke take control of the maintenance of the satellite treatment system.

A discussion ensued regarding biochemical oxygen demand.

Ms. Brydon left the meeting at 5:30 p.m.

Mr. Forge lead a discussion regarding resource recovery and referenced the *Resources From Waste - Integrated Resource Management Study*. It was noted that the Municipality should

Action

consider preparing the community for purple pipe system to re-use and conserve water and that there is funding opportunities for green initiatives. The committee discussed greywater issues and challenges.

The committee discussed stage 3 tasks and the consideration of on-site septic management system bylaw regulations. Cindy Walsh

Mr. Reynolds reported that once a week EPCOR Transports and disposes 30 yards (10000 kg) of bio solids at $1500/bin for composting at the Hartland Land fill.

The committee asked for a list of plants that provide bio fuel composting

6. **Next Meetings:**

September 18, 2008 from 1:00 p.m. – 5:00 p.m.
October 16, 2008 from 1:00 p.m. – 5:00 p.m.
January 22, 2009 from 1:00 p.m. – 5:00 p.m.

It was noted that a public open house would be held in February and a finalizing document would be presented to Council in March

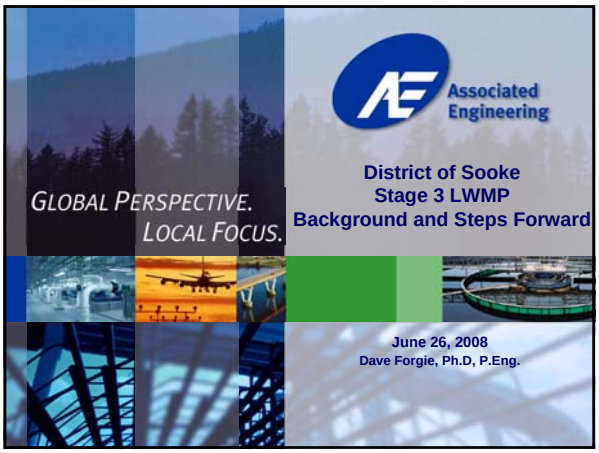
7. **Adjournment**

The meeting was adjourned at 4:22 p.m.

_____ _____

Laura Byrne
Chair

Evan Parliament,
Chief Administrative Officer



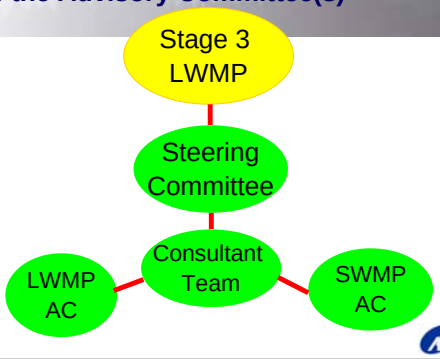
Outline

- LWMP process
- Stage 2 Background
- Stage 2 Conclusions
- Ministry of Environment Approval
- Tasks for Stage 3
- Preview of Discussion Paper 1
- Discussion and Questions

The Liquid Waste Management Process

- LWMP's are developed in three stages, each with public input
- An approved LWMP can allow the District to proceed to implementation without a referendum (if it so chooses)
- Stage 1 focuses on background data and general treatment options
- Stage 2 focuses on more detailed servicing and treatment options
- Stage 3 typically deals with financing options and implementation schedules

Role of the Advisory Committee(s)



Stage 2 Background

- Stage 1 was deemed to be the work completed by Stantec (focussed mainly on the "Core Area")
- Previous work did not address what to do with wastewater outside of the Core Area:
  - Stay on on-site systems?
  - Develop cluster treatment systems?
  - Connect to the new treatment plant?

Other Stage 2 Issues

- Minimum Lot Sizes for on-site treatment - Community, Aboriginal and Women's Services (now Community Services) suggested that the minimum lot size should be 1 hectare (2.47 acres)
- Level of treatment - Is secondary treatment enough?
- Storm water management – What needs to be done?

The Stage 2 documents

- TM 1 – Suitability of Soils for On-site
- TM2 – Alternatives to On-site Treatment
- TM3 – Generic Service Area Model
- TM4 – Recommendations re: On-site treatment
- TM5 - What to do in existing areas
- TM6 – Storm Water Impact Scoping
- The Treatment Needs Report
- An overall Summary Report complete with conclusions and recommendations

Stage 2 Conclusions

- Very few areas in the District have optimal conditions for on-site septic tank disposal systems.
- Areas with low likelihood of suitable soils should have a minimum lot size of 1 hectare (2.4 acres).
- Housing lots for other areas should require additional land for a second septic tank disposal field:
  - Minimum recommended lot size of 2200 to 2600 m^2 versus existing lots of 800 to 900 m^2

Stage 2 Conclusions (continued)

- Septic tank systems should only be developed after 1 year of data gathering.
  - Percolation rates over 1 wet season
  - Groundwater elevation over 1 wet season
- Septic tank systems can only be designed and installed by QP.
- Alternative treatment systems should be permitted.
  - However, the need for a second disposal field should NOT be waived for these systems.

Stage 2 Conclusions (continued)

- Cluster-type treatment systems should be permitted in the areas currently a considerable distance from the Core Area sewer system
- For a cluster type systems, the minimum effluent quality should be:
  - <10 mg/L BOD
  - <10 mg/L TSS
  - <2.2 fecal coliforms/100 mL
- This should permit surface discharge

Stage 2 Conclusions (continued)

- Existing subdivisions near the Core Area should be investigated using the “green field” approach.
- If the existing subdivision passes the test, then probabilistic present value analyses, similar to that in TM5, should be conducted.
- Procedures should be developed to deal with subdivisions that are favourable for connection to the Core Area sewer system, e.g. referendums.

Ministerial Approval of Stage 2

- Stage 2 LWMP report was submitted for approval in November 2005.
- Approval was finally received in December 2007
- Approval letter was quite prescriptive as to what was needed for Stage 3
- Stage 3 Terms of Reference was based on this letter

Stage 3 Tasks

- Investigation of remaining treatment plant capacity and the possibility of extending the sewer area
- Reconsidering the effluent standard requirements for cluster and/or satellite developments
- Investigation of how future development adjacent to Sooke Basin will be serviced
- Development of a time table and budget to complete the on-going Stormwater management plan
- Consideration of a on-site septic system management system through a servicing bylaw
- Investigate beneficial reuse opportunities for septage solids and wastewater treatment sludges

Stage 3 Tasks (continued)

- Development of terms of reference and a commitment to establish an on-going plan monitoring committee.
- Development of draft Operational Certificates for existing treatment plant(s) and/or setting registration stds.
- Identification of the cost per user for users in both the sewered and non-sewered areas
- Development of an implementation plan for the intended commitments in the Plan
- Development of draft bylaws necessary to implement the LWMP

Stage 3 Tasks (continued)

- Meetings with the advisory committee as the various discussion papers (or tech memos) are developed
- Development of a draft Stage 3 Summary document
- Presentation of the draft Stage 3 Summary document to the advisory committee and council
- Presentation of the draft Stage 3 Summary document to the public at an open house meeting
- Finalization of the Stage 3 Summary document
- Submission of the Final Stage 3 document to Council for approval and forwarding to the MoE.

Next Steps

- Develop discussion papers to deal with the requirements in the work tasks
- Circulate discussion papers (2 to 4 at a time)
- Meet with the advisory committee to discuss the draft discussion papers
- Move to completion of the Draft Stage 3 report
- Present the draft Stage 3 report to the public
- Finalize and submit the Stage 3 report

Preview of Discussion Paper 1 Considerations for adding “new comers”

- In this case, “new comers” would be areas that are under potential consideration to be added to the sewered area in Sooke
- Questions relate to apportioning the cost of the new system (sewers and treatment system(s)) back to the users in a fair and equitable way
- Situations will vary:
  - When no excess capacity is available
  - When excess capacity is available:
    - Sufficient capacity is available
    - Less than sufficient capacity is available

When no excess capacity is available

- Likely clear that the new comers need to pay for the new required capital, regardless of the availability of grants
- The new comers would likely also need to pay for a portion of the fixed infrastructure, e.g. the head works (screens, grit removal) and the sludge handling system
- The new comers and existing users should likely share the operation costs equally (based on single family equivalents or flow)

When excess capacity is available

- When available capacity is more than sufficient:
  - Let the new comers use that capacity OR
  - Have them build all new capacity anyway
- When the available capacity is less than sufficient:
  - Let the new comers use the available capacity and build new capacity for the rest OR
  - Have them build all new capacity
- How to apportion costs in the cases with use of (some) existing capacity would be “interesting”

Discussion Paper 1

- Will deal with these considerations
- How to deal with “new comers” needs to be decided as part of the LWMP
- Further discussion at the next meeting

Discussion and Questions

DISTRICT OF SOOKE

Liquid Waste Management Plan (Sanitary), Stage 3 Advisory Committee

Meeting # 2 – September 18, 2008
1:00 PM – Fire Training Room
2225 Otter Point Road

Committee Members Present:

Dave McClimon, Community Representative
Rod Vowels, Community Representitive
Cindy Walsh, Senior Environmental Protection Officer, Ministry of Environment
Tammi Wetmore, EPCOR
Kerrie McLean, T'Sou-ke Nation
Alan Deslile, T'Sou-ke Nation Consultant
Michael Riefman, Vancouver Island Health Authority

District Staff

Darcey Kohuch, Director of Engineering
Laura Byrne, Engineering Technician
Lisa Urlacher, Council Clerk
Al Fontes, Senior Engineering Technologist

Consultant

Dave Forgie, Team Leader, Associated Engineering Ltd.

Absent

Peter Law, Ecosystem Biologist, Ministry of Environment
Mark Gauti, Land Manager, T'Sou-Ke First Nations
William Norton, Community Representative
Councillor Ron Dumont
Julia Brydon, Pollution Prevention Coordinator, Environment Canada
Chris Jensen, Municipal Infrastructure Resource Officer, Ministry of Community Services
Rob Miller, Team Leader, Downstream Environmental Consulting Ltd.
Rick Lloyd, Team Engineer, RCL Consulting Ltd.
Lehna Malmkvist, Team Biologist, Swell Environmental Consulting
John Reynolds, EPCOR
Blake Medlar, Government and Compliance Section Head, Ministry of Environment
Russ Chipps, Beecher Bay Nation

Information Only

Eric Lund, Juan de Fuca Electoral Area Director
Dave Drummond, CAO Metchosin

Action

1. **Introductions**

The meeting began at 1:17 p.m. and Ms. Byrne welcomed and introduced Rod Vowels.

Mr. Kohuch asked that Mr. Mclimmon be appointed chairperson as Ms Byrne's role as a staff member is advisory, consultative and information -sharing capacity.

The Committee agreed to appoint Mr. Mclimmon as chairperson.

Ms. Byrne advised that the District of Sooke continues to advertise for additional Community Representative and that Bev Befus will be another addition to the committee as a community representative.

2. **Approval of Agenda**

The agenda was approved as circulated

3. **Adoption of Minutes**

The minutes of June 26, 2008 were approved as circulated.

4. **Discussion Paper 1- Adding New Sewered Areas**

Mr. Forgie provided a power point presentation and gave a brief introduction and history:

- The Ministry of Environment and Ministry of Community Services have always been "interested" in the potential to add more connections to the SSA.
- Previously, at the time of the Stage 2 submission, this was impossible (the plant wasn't built)
- Now, with the plant built and most SSA connections made, an answer is closer

The committee discussed expansion where there is no excess capacity. Mr. Kohuch described the policies and bylaws for Development Cost Charges and Sewer Generation Charges for future expansion :

- If there is no excess capacity, new comers will need to pay for the new capacity that they need
- Could also pay for a portion of the existing fixed infrastructure, e.g. headworks
- "Wrinkle" is the new capacity that is built will exceed the needs of the new comers – who pays for the new excess capacity? (The District or the new comers?)
- Operation and Maintenance costs should be shared across all the users, old and new.

Mr. Forgie provided an overview of expansion when there is excess capacity:

- If there is lots of excess capacity, new comers could be just allowed to use the excess capacity without a capital buy-in at the time (use now, pay later)
- Alternately, even when there is excess capacity, the new comers could be charged for the cost of just the capacity that they need (The District would bank the money in a special reserve fund to be used later when the capacity expansion is needed)
- If there is only some excess capacity (but not enough) for the all the new comers, it would be simpler to charge the new comers up front for the new capacity.
- Operation and Maintenance costs should be shared across all the users, old and new.

Action

- If there is lots of excess capacity, new comers could be just allowed to use the excess capacity without a capital buy-in at the time (use now, pay later)
- Alternately, even when there is excess capacity, the new comers could be charged for the cost of just the capacity that they need (The District would bank the money in a special reserve fund to be used later when the capacity expansion is needed)
- If there is only some excess capacity (but not enough) for the all the new comers, it would be simpler to charge the new comers up front for the new capacity.
- Operation and Maintenance costs should be shared across all the users, old and new.

It was noted that more people need to pay in to the make it cost effective.

Mr. Forgie provided detailed scenarios of bringing in distant properties to the Waste Water Treatment Plant as outlined in Discussion paper 1:

Evaluation of Potential Areas for Expansion

- Reviewed the May 2008 Stantec “Sooke Sewer Model – Conceptual Design Report”
- Some excess capacity currently exists – but it could be used up by late comers to the existing SSA.
- Focused on Option 4 because it involves full sewering of the Urban Containment area
- Evaluated the estimated costs per area on a new single family equivalent (SFE) basis
- Developed a grouped list of priorities for inclusion
- Areas that have the lowest economic cost for inclusion include: Eridan, West Coast Road expansion, Helgesen expansion and Foreman Heights
- The highest economic cost areas are the Whiffen Spit West, North, and South and Silver Spray
- The areas to the east are in a middle economic feasibility group and are very much a “domino”, especially for Grouse Nest.

The committee discussed proving 25% failure of on site septic to qualify for a 2/3 infrastructure grant from the Province.

A discussion ensued regarding the extension of sewer to the Kaltasin area and the opportunity to provide service through a serving agreement to the T'Sou-ke Nation.

The committee discussed the cost of additional force mains and excavation for recovery costs through a latecomers charge.

The following action item was agreed to:

- overlay of environmental information on the matrix to include coliform count, soil type and age of properties. **Tammi Wetmore**

Ms. Urlacher left the meeting at 2:55 pm

Discussion Paper 2- Satellite Treatment Plant Effluent Standards

Mr. Forgie provided a power point presentation and gave a brief introduction and history:

- Stage 2 of the LWMP anticipated that many areas outside the SSA would be too costly to include in the SSA
- Stage 2 recommended that satellite WWTPs (connected to local remote sewer areas but not the SSA) should have to meet the MSR reclaimed water quality standards
- The Ministry of Environment, in their Stage 2 approval letter, suggested this might be too onerous and suggested a re-visit on this

Mr. Forgie provided a Power Point presentation over viewing the following:

Maintaining the Reclaimed Water Standard

- Reclaimed water standard includes:
    - BOD < 10 mg/L
    - Turbidity < 2 NTU (very clear)
    - Fecal Coliforms < 2.2 CFU/100 mL (no shellfish issues)
    - Phosphorus < 1 mg/L (only for discharges to embayed waters, e.g. Sooke Basin)
- Membrane Bioreactors (MBRs) are most capable of achieving this requirement (but they are not cheap)
- MBRs also most likely to be able to remove EDCs and PPCPs (no legislative requirement yet) – additional treatment may still be required for creek discharge
- Redundancy requirements will add significant cost

Going to Secondary Treatment Standards

- Secondary treatment standard includes:
    - BOD < 45mg/L
    - Total Suspended Solids < 45 mg/L
    - Fecal Coliforms < 200 CFU/100 mL (shellfish?)
    - Phosphorus < 1 mg/L (only for discharges to embayed waters, e.g. Sooke Basin)
- Normal secondary treatment only partially removes EDCs and PPCPs (no legislative requirement yet)
- Discharge cannot be to local creeks, must be via outfall to Sooke Harbour/Basin or open marine waters (EDC/ PPCP removal less important)
- Redundancy requirements lower

The committee discussed the need for a complete redundancy program in the system required.

Summary and Conclusions

- If discharge is to “embayed” waters, phosphorus removal will be required regardless.
- Reclaimed water standard will require additional treatment before creek discharge
- Secondary treatment will require outfalls to Sooke Basin or Harbour or Sooke Bay
- Discharge of secondary effluent to Sooke Harbour or Basin may not protect shellfish

Recommendations

- Maintain the Stage 2 recommendation for reclaimed water standards and add a requirement for additional treatment re: EDCs and PPCPs removal, for creek/stream discharge
- Only allow secondary treatment standard if the discharge is via outfall to open marine waters of Sooke Bay

It was noted that the Ministry of Environment will support the District of Sooke decisions regarding the management of sewage based on the LWMP.

Mr. Reifman left the meeting at 3:28 p.m.

Ms. McLean advised the committee that the T’Sou-ke Nation will be sending a letter of support the prohibition of outfalls in the Harbor and Basin.

Kerri McLean and Mr. Deslile left the meeting at 3:44 p.m.

Discussion Paper 3- Treatment Options for Areas Around Sooke Basin and Harbour

Mr. Forgie provided a power point presentation and gave a brief introduction and history:

- Areas outside the existing SSA are currently on some form of on-site treatment (either individual or cluster/strata) with ground disposal
- Reasons to change this situation could include:

    - Options for dealing with this situation include:
    - Expansion of the SSA to the area in question
    - Satellite treatment and appropriate disposal
    - On-site treatment

Expanding the Sewer Service Area

- Stage 3 DP 1 looked at the potential to add new areas to the existing SSA
- Very few areas are economically viable for such expansion, e.g. Foreman Heights
- Connection of other areas would have to be driven by developers who consider the cost of connection as “doable”, i.e. won’t push the lot price too high.
- Developer should have to pay all extra costs for sewers, pump stations and treatment plant capacity
- The District might be wise to contribute further via upsizing pipes and pump stations for future use

Satellite Treatment and Appropriate Disposal

- Stage 3 DP 2 looked at the issues related to satellite treatment and effluent quality standards
- DP2 concluded standards for satellite treatment should be reclaimed water (plus) or secondary treatment with ocean outfall
- Either option will be expensive
- Developers will have to include these costs in their business plans

On site Treatment

- On-site treatment could range from individual home Type 1 or Type 2 systems to cluster/strata systems serving 16 homes (each), all with ground disposal
- To a developer, on-site means that the lot sizes need to be larger than if the homes were on sewer – this may or may not fit their business plan
- A developer would have to weigh the options: SSA connection, satellite or on-site versus the benefits, i.e. numbers of lots available.

Other Factors

- The District would be wise to be wary of non-SSA treatment plants and the potential that the District would become responsible for their operation and maintenance should problems arise
- Under the MSR (for satellite treatment), the proponent needs to post a bond that would be used to fix major problems
- There is no such requirement under the Health Act for on-site treatment, including strate/clusters.
- The District might want to:
    - Require bonds for all non-SSA treatment plants
    - Require plant operation to be contracted

Summary and Conclusion

- Developers have three options to serve new areas, outside the SSA, to consider in their business plans:
    - Pay for connection to the SSA; negotiate additional capacity needs with the District
    - Satellite treatment (as per DP2)
    - On-site treatment (likely under Health)
    - The District might want to require bonds and contact operation for all non-SSA collection and treatment systems

The following action item was agreed to:

• Check records for fecal coliform counts at Knott Brook outfall	**Laura Byrne**
• To provide information on the quality of effluent of type 2 systems and modify Discussion paper 3 to include the information	**Dave Forgie**
• To send policy for connection fees and DCC to the consultant	**Al Fontes**
• To send Stormwater quality report the consultant	**Laura Byrne**

Next Meetings:

October 16, 2008

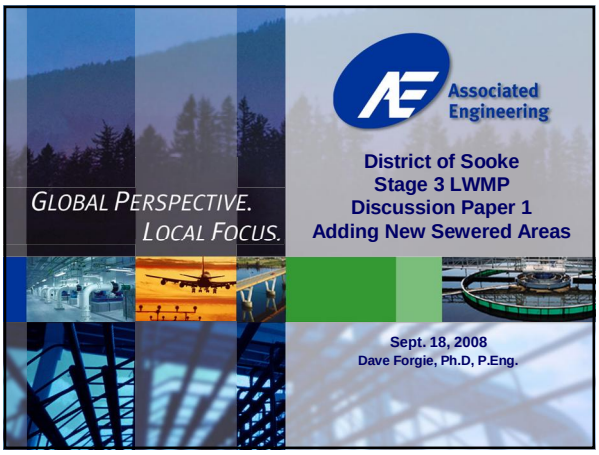
Adjournment

The meeting was adjourned at 5:05 p.m.

_____ _____

Dave Mclimmon
Chair

Evan Parliament,
Chief Administrative Officer



Outline

- Introduction/ Background
- Potential Buy-in Options
  - When there is no excess capacity
  - When there is excess capacity
- Evaluation of Potential Areas for Expansion
- Overall Conclusions
- Discussion

Introduction/Background

- The Ministry of Environment and Ministry of Community Services have always been "interested" in the potential to add more connections to the SSA.
- Previously, at the time of the Stage 2 submission, this was impossible (the plant wasn't built)
- Now, with the plant built and most SSA connections made, an answer is closer

But first, a little philosophy…

- Need to look at the hypothetical situations before dealing with reality

Expansion when there is no excess capacity

- If there is no excess capacity, new comers will need to pay for the new capacity that they need
- Could also pay for a portion of the existing fixed infrastructure, e.g. headworks
- "Wrinkle" is the new capacity that is built will exceed the needs of the new comers – who pays for the new excess capacity? (The District or the new comers?)
- Operation and Maintenance costs should be shared across all the users, old and new.

Expansion when there is excess capacity

- If there is lots of excess capacity, new comers could be just allowed to use the excess capacity without a capital buy-in at the time (use now, pay later)
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- If there is only some excess capacity (but not enough) for the all the new comers, it would be simpler to charge the new comers up front for the new capacity.
- Operation and Maintenance costs should be shared across all the users, old and new.

Summary

- New comers to the SSA should pay their way with regard to new capacity (with or without grants)
- Excess new capacity above that needed for the new comers will probably have to be paid for by the District (for later payment by late-comers)
- Operation and maintenance costs should be shared by all system users

Evaluation of Potential Areas for Expansion

- Reviewed the May 2008 Stantec "Sooke Sewer Model – Conceptual Design Report"
- Some excess capacity currently exists – but it could be used up by late comers to the existing SSA.
- Focused on Option 4 because it involves full sewering of the Urban Containment area
- Evaluated the estimated costs per area on a new single family equivalent (SFE) basis
- Developed a grouped list of priorities for inclusion

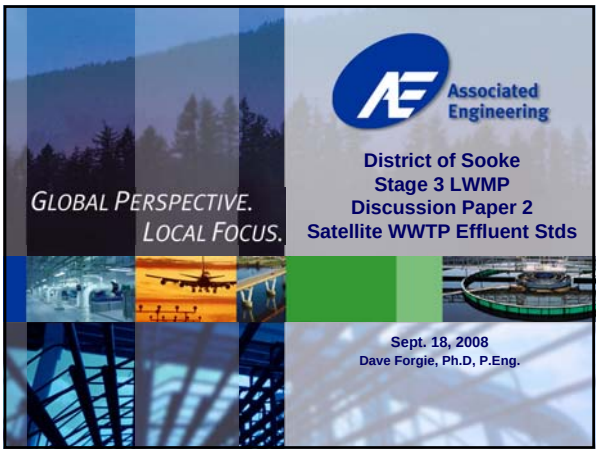
Evaluation of Potential Areas for Expansion, cont'd

- Areas that have the lowest economic cost for inclusion include: Erinan, West Coast Road expansion, Helgesen expansion and Foreman Heights
- The highest economic cost areas are the Whiffin Spit West, North, and South and Silver Spray
- The areas to the east are in a middle economic feasibility group and are very much a "domino", especially for Grouse Nest

Conclusions

- Guiding Principle for addition of new sewered areas should be they have to pay their fare share and not be subsidized by those in the existing SSA
- Only the areas to the north and west of the existing SSA are within reasonable economic reach of an expanded SSA

Discussion



Outline

- Introduction/ Background
- Maintaining Reclaimed Water Quality Stds
- Allowing Secondary Treatment Stds
- Conclusions and Recommendations
- Discussion

Intro/background

- Stage 2 of the LWMP anticipated that many areas outside the SSA would be too costly to include in the SSA
- Stage 2 recommended that satellite WWTPs (connected to local remote sewer areas but not the SSA) should have to meet the MSR reclaimed water quality standards
- The Ministry of Environment, in their Stage 2 approval letter, suggested this might be too onerous and suggested a re-visit on this

Maintaining the Reclaimed Water Standard

- Reclaimed water standard includes:
  - BOD < 10 mg/L
  - Turbidity < 2 NTU (very clear)
  - Fecal Coliforms < 2.2 CFU/100 mL (no shellfish issues)
  - Phosphorus < 1 mg/L (only for discharges to embayed waters, e.g. Sooke Basin)
- Membrane Bioreactors (MBRs) are most capable of achieving this requirement (but they are not cheap)
- MBRs also most likely to be able to remove EDCs and PPCPs (no legislative requirement yet) – additional treatment may still be required for creek discharge
- Redundancy requirements will add significant cost

Going to Secondary Treatment Stds

- Secondary treatment standard includes:
  - BOD < 45mg/L
  - Total Suspended Solids < 45 mg/L
  - Fecal Coliforms < 200 CFU/100 mL (shellfish?)
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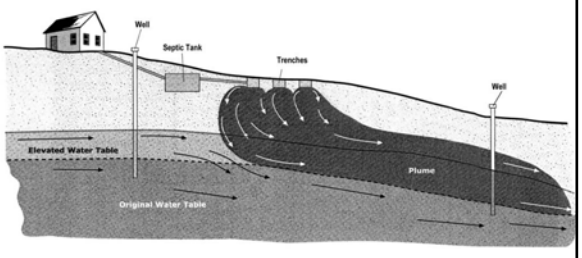
- Redundancy requirements lower

Summary and Conclusions

- If discharge is to “embayed” waters, phosphorus removal will be required regardless.
- Reclaimed water standard will require additional treatment before creek discharge
- Secondary treatment will require outfalls to Sooke Basin or Harbour or Sooke Bay
- Discharge of secondary effluent to Sooke Harbour or Basin may not protect shellfish

Recommendation

- Maintain the Stage 2 recommendation for reclaimed water standards and add a requirement for additional treatment re: EDCs and PPCPs removal, for creek/stream discharge
- Only allow secondary treatment standard if the discharge is via outfall to open marine waters of Sooke Bay



Treatment of Septic Tank Effluent in Soil

Table3-17. Examples of soil infiltration system performance

Parameter	Applied concentration in milligrams per liter	Percent removal	References
BOD_5	130–150	90–98	Siegrist et al., 1986 U. Wisconsin,1978
Total nitrogen	45–55	10–40	Reneau 1977 Sikora et al., 1976
Total phosphorus	8–12	85–95	Sikora et al., 1976
Fecal coliforms	NA*	99–99.99	Gerba, 1975

* Fecal coliforms are typically measured in other units, e.g., colony-forming units per 100 milliliters.

Source: Adapted from USEPA, 1992.

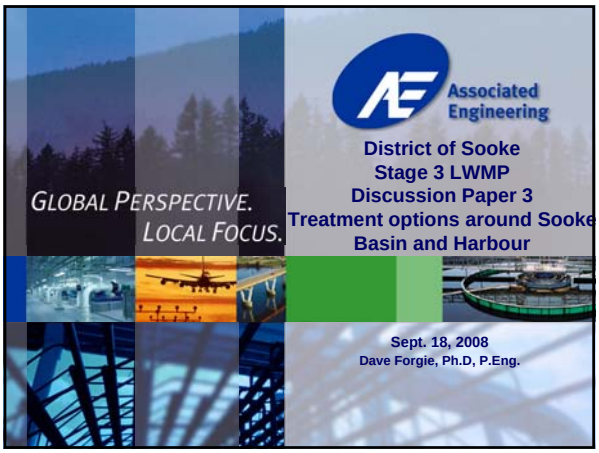
USEPA Onsite Wastewater Treatment Systems Manual 3-23

Septic Tank effluent treatment in fine sand

Table 3-18. Case study: septic tank effluent and soil water quality *

Parameter (units)	Statistics	Septic tank effluent quality	Soil water quality * at 0.6 meter	Soil water Quality* at 1.2 meters
BOD (mg/L)	Mean Range # samples	93.5 46–156 11	<1 <1 6	<1 <1 6
TOC (mg/L)	Mean Range # samples	47.4 31–68 11	7.8 3.7–17.0 34	8.0 3.1–25.0 33
TKN (mg/L)	Mean Range # samples	44.2 19–53 11	0.77 0.40–1.40 35	0.77 0.25–2.10 33
NO_3-N (mg/L)	Mean Range # samples	0.04 0.01–0.16 11	21.6 1.7–39.0 35	13.0 2.0–29.0 32
TP (mg/L)	Mean Range # samples	8.6 7.2–17.0 11	0.40 0.01–3.8 35	0.18 0.02–1.80 33

Discussion



Outline

- Introduction/ Background
- Expansion of the SSA to the area in question
- Satellite Treatment and Appropriate Disposal
- On-Site Treatment
- Other factors to consider
- Conclusions

Intro/background

- Areas outside the existing SSA are currently on some form of on-site treatment (either individual or cluster/strata) with ground disposal
- Reasons to change this situation could include:
  - Environmental issues re: septic tank failures
  - Increased development pressures for higher density developments away from the SSA
- Options for dealing with this situation include:
  - Expansion of the SSA to the area in question
  - Satellite treatment and appropriate disposal
  - On-site treatment

Expanding the existing SSA

- Stage 3 DP 1 looked at the potential to add new areas to the existing SSA
- Very few areas are economically viable for such expansion, e.g. Foreman Heights
- Connection of other areas would have to be driven by developers who consider the cost of connection as “doable”, i.e. won’t push the lot price too high.
- Developer should have to pay all extra costs for sewers, pump stations and treatment plant capacity
- The District might be wise to contribute further via upsizing pipes and pump stations for future use

Satellite Treatment and Appropriate Disposal

- Stage 3 DP 2 looked at the issues related to satellite treatment and effluent quality standards
- DP2 concluded standards for satellite treatment should be reclaimed water (plus) or secondary treatment with ocean outfall
- Either option will be expensive
- Developers will have to include these costs in their business plans

On-site Treatment

- On-site treatment could range from individual home Type 1 or Type 2 systems to cluster/strata systems serving 16 homes (each), all with ground disposal
- To a developer, on-site means that the lot sizes need to be larger than if the homes were on sewer – this may or may not fit their business plan
- A developer would have to weigh the options: SSA connection, satellite or on-site versus the benefits, i.e. numbers of lots available.

Other Factors

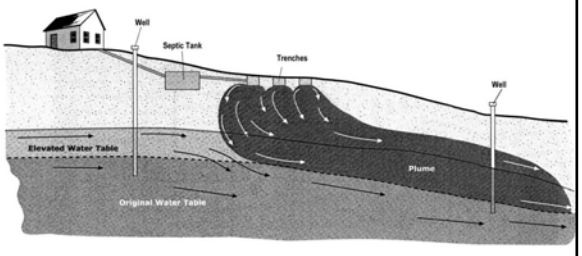
- The District would be wise to be wary of non-SSA treatment plants and the potential that the District would become responsible for their operation and maintenance should problems arise
- Under the MSR (for satellite treatment), the proponent needs to post a bond that would be used to fix major problems
- There is no such requirement under the Health Act for on-site treatment, including strate/clusters.
- The District might want to:
  - Require bonds for all non-SSA treatment plants
  - Require plant operation to be contracted

Summary and Conclusions

- Developers have three options to serve new areas, outside the SSA, to consider in their business plans:
  - Pay for connection to the SSA; negotiate additional capacity needs with the District
  - Satellite treatment (as per DP2)
  - On-site treatment (likely under Health)
- The District might want to require bonds and contact operation for all non-SSA collection and treatment systems

Discussion

Type 1 Septic System Schematic



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USEPA Onsite Wastewater Treatment Systems Manual 3-23

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DISTRICT OF SOOKE

Liquid Waste Management Plan (Sanitary), Stage 3 Advisory Committee

Meeting # 3 – October 16, 2008
1:00 PM – Council Chambers
2225 Otter Point Road

Committee Members Present:
Dave McClimon, Community Representative
Cindy Walsh, Senior Environmental Protection Officer, Ministry of Environment
Councillor Ron Dumont

District Staff
Lisa Urlacher, Council Clerk
Al Fontes, Senior Engineering Technologist

Consultant
Dave Forgie, Team Leader, Associated Engineering Ltd.

Absent
Tammi Wetmore, EPCOR
Kerrie McLean, T'Sou-ke Nation
Alan Deslile, T'Sou-ke Nation Consultant
Michael Riefman, Vancouver Island Health Authority

Rod Vowels, Community Representative
Peter Law, Ecosystem Biologist, Ministry of Environment
Mark Gauti, Land Manager, T'Sou-Ke First Nations
William Norton, Community Representative
Julia Brydon, Pollution Prevention Coordinator, Environment Canada
Chris Jensen, Municipal Infrastructure Resource Officer, Ministry of Community Services
Rob Miller, Team Leader, Downstream Environmental Consulting Ltd.
Rick Lloyd, Team Engineer, RCL Consulting Ltd.
Lehna Malmkvist, Team Biologist, Swell Environmental Consulting
John Reynolds, EPCOR
Blake Medlar, Government and Compliance Section Head, Ministry of Environment
Russ Chipps, Beecher Bay Nation

Information Only

Eric Lund, Juan de Fuca Electoral Area Director
Dave Drummond, CAO Metchosin

Action

The meeting began at 1:23 p.m.

1. **Approval of Agenda:**

The agenda was approved as circulated

2. **Adoption of Minutes:**

The minutes of September 18, 2008 were approved as circulated.

3. **Business arising form the minutes:**

The committee discussed the options of treated water brought across the harbor or keeping the treated water on site and argued that having septic systems increases the risk on the harbour.

The committee asked that the treatment of septic tank effluent be incorporated into discussion paper 3. **Dave Forgie**

The committee had concerns about the accumulation of phosphorus when using septic fields.

The committee agreed that the septic area needs to be increased when the tank is increased and that there are variables of well maintained fields such as the older versions which do not have the grey water discharging into the tank.

4. **Discussion Paper 4- Rainwater Management**

Mr. Forgie provided a power point presentation and overviewed the background of rainwater verses stormwater, the plan direction, the terms of reference, schedule and the budget.

The committee asked that the Stage 1 Report be uploaded to the District of Sooke website (71 recommendations). **Laura Byrne**

The committee discussed the tools to implement the stormwater recommendations such as bylaws, latecomers agreements and development. It was noted that the Official Community Plan needs to drive the density.

The committee asked that a more detailed schedule for the LWMP (stormwater) and the upcoming milestones be circulated. **Rob Miller**

It was noted that the Finance and Administration Committee needs to anticipate the expenditures for implementation of the LWMP (Stormwater) and that the final plan be implemented into the budget. **Rob Miller / Finance**

Action

Discussion Paper 5- On-Site System Management Options

Mr. Forgie provided a Power Point presentation highlighting the options:

Private-Private Management Program

- Privately-owned and maintained on-site systems and Privately- operated inspection program which are “Private-Private”

Private-Public Management Program

- Privately-owned and maintained on-site systems and Publicly-operated inspection program which are “private-public”

Mr. Forgie summarized that on-site system management programs ensure that inspections and maintenance are done regularly and that there are many options and factors to consider prior to implementing a management program.

The committee discussed public education programs and inquired about the Vancouver Island Health Authority Septic Tank Maintenance Program. **Dave Forgie**

Mr. Forgie recommended that the District of Sooke should develop and implement a septic tank education program based on the CRD model. If the District of Sooke opts for a septic tank management program, the private-private model should be used (similar to the CRD system).

The committee asked that data be compiled for properties on sewer, septic, water and well. **Staff**

Discussion Paper 6- Biosolids Management Options

Mr. Forgie provided a power point presentation and overviewed the background, current practices and options for Biosolid management.

Mr. Forgie presented options for dewatered biosolids such as land application, composting and renewable energy.

The committee inquired as to the composting plan for the Sooke Treatment Plant. **EPCOR**

Mr Forgie summarized that land application to forest lands and gravel pits has some potential. That composting could have some potential based on other successes. That the use as a fuel is unlikely unless part of a CRD program (yet to be developed) and to keep options open and to look for opportunities to divert the current practice of biosolids from the landfill.

The committee asked that the jurisdiction be clarified as to federal or provincial for boats dumping in the harbor. **Staff**

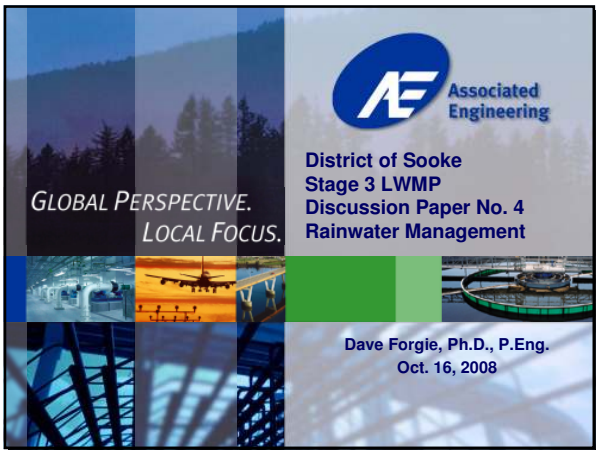
Next Meetings:

It was discussed that the next scheduled meeting would be January 22, 2008 from 1:00 p.m. to 5:00 p.m.

Adjournment

The meeting was adjourned at 5:15 p.m.

Dave Mclimmon Chair	Evan Parliament, Chief Administrative Officer



Outline

- Background
  - Rainwater vs. Stormwater
- Plan Direction
- Scope / Terms of Reference
- Schedule
- Budget

Background

- LWMP must include both wastewater and stormwater (now called "rainwater")
- Stage 2 of the LWMP focused only on wastewater (priority over rainwater)
- Rainwater Management Plan was started after submission of Stage 2 LWMP (Wastewater)
- Stage 1 LWMP (Rainwater) has been completed

Background (cont'd)

- MoE December 2007 Stage 2 LWMP (Wastewater) approval required more rainwater details
- Required details included the following:
  - Scope
  - Budget
  - Schedule

LWMP (Rainwater) Stage 2 and 3 Direction

- Municipal stormwater infrastructure developed in manner that will result in **healthy watercourses** and **healthy near-shore marine environment**
- Watershed-based management approaches implemented to **protect Sooke's 14 watersheds**
- **Low impact development techniques** employed to maintain and restore pre-development hydrologic regime of urbanized and developing watersheds
- Biological and chemical contaminants do not enter stormwater flows (**stormwater source control**)
- **Green infrastructure** approach to stormwater management to provide cleaner air via well treed riparian zones and streetscapes

LWMP (Rainwater) Stage 2 and 3 Scope / Terms of Reference

- Manage Plan development using 5 guiding principles outlined in *Stormwater Planning: Guidebook for British Columbia*
- Develop Plan with input from District planning and engineering departments
- Undertake detailed investigations of all 71 recommendations of Stage 1 LWMP (Stormwater)
- Develop implementation strategies for all 71 recommendations
- Complete following projects:
  - "Stormwater Quantity" - update Sooke Subdivision and Development Standards Bylaw
  - "Stormwater Quality" - adopt stormwater quality protection bylaw and regulatory codes of practice

LWMP (Rainwater) Stage 2 and 3 Scope / Terms of Reference (cont'd)

- Develop implementation strategies modeled from other jurisdictions and specific solutions for District of Sooke
- Work closely with District of Sooke staff, advisory committees, Province, and others to confirm Plan activities are realistic and resources are or will be available for plan implementation
- Provide report describing project consultation and public involvement process, including evidence of First Nations involvement
- Integrate Plan with District of Sooke Official Community Plan, as appropriate, and integrate various aspects of Final Stage 2 and 3 report

LWMP (Rainwater) Stage 2 and 3 Scope / Terms of Reference (cont'd)

- Develop costs per household for plan implementation over life of plan
- Develop Terms of Reference for an ongoing Plan Monitoring committee, its structure, and an independent assessment process
- Amend some existing bylaws and prepare others under Plan development
- District of Sooke to provide designated project manager

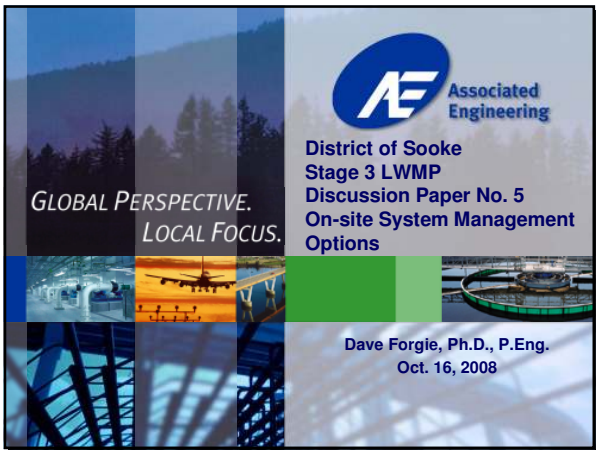
Schedule

- Timeline for project completion
  - 1 year from contract signing
  - Contract was signed early May 2008
  - Based on info from Downstream Environmental Consulting Ltd.
- Contract may have to run longer because of District of Sooke staff changes

Budget

- Budget for completing Stage 2 and 3 LWMP (Rainwater) ~ $110,000
- As of October 8th, 2008
  - ~ 23% of work completed
  - ~ 23% of the budget expended
- At this point, it is assumed that funds will be adequate and that project will come in on budget

Discussion / Questions?



Outline

- Background
- On-site System Management Options
  - Example: Capital Regional District
  - Management Program Costs
- Public Education Programs
- Summary

Background

- On-site systems require regular inspection and maintenance
- Frequency for system clean-outs and inspections every ~2 to 5 years
- New Sewerage System Regulation → on-site system management program required
- Old systems are NOT covered ("orphans")

On-site System Management Options

- Privately-Owned and Maintained On-Site Systems and Privately-Operated Inspection Program
  - "Private-Private"
- Privately-Owned and Maintained On-Site Systems and Publicly-Operated Inspection Program
  - "Private-Public"

Private-Private Management Program

- Ownership of septic systems remains with individuals ("private")
- Responsibility for arranging clean-outs and inspections, i.e., ~ every 3 years, is left with owners ("private")
- The District ("public") would only keep records and ensure (through taxes) that clean-outs and inspections happened

Private-Private Management Program cont'd

- Advantages
  - Helps to ensure that systems work properly
  - Owner maintains control over who does inspections
- Disadvantages
  - Difficulty issuing licences if there are incomplete records of the system
  - Property owner has to take responsibility to get inspection done and submit application

Private-Public Management Program

- Ownership of septic systems remains with individuals (“private”)
- Responsibility for arranging clean-outs and inspections, i.e., ~ every 3 years, is taken on by the District (“public”)
- The District (“public”) would also keep records of inspections and follow-ups on maintenance

Private-Public Management Program cont’d

- Advantages
  - Helps to ensure that systems work properly
  - The District ensures inspection occurs
- Disadvantages
  - Control is taken away from system owner
  - Concerns about inspectors entering private property
  - Collection of fee for inspection could be problematic unless fee is added to annual tax bill

Example On-site Management Program: Capital Regional District

- Implemented as part of Liquid Waste Management Program
- Opted for **Private-Private** management program
- CRD Bylaw 3479 requires owners of septic system to pump out tanks by end of 2010 and every 5 years thereafter
  - Owners must show proof of compliance to CRD
  - CRD charges $25 per system per year for keeping the records

On-Site Management Program Costs

- Conceptual budgets were developed for Private-Private and Private-Public management programs
- Based on servicing of 625 septic tanks

On-Site Management Program Costs: Private-Private

- Estimated time commitment for the District
  - Program staff: 0.5 hr per client per year
  - Supervisory time: 1 hr per week
- Fixed costs include twice per year mailouts of septic tank operation educational material
- Clean-out and inspection estimated at $225 once every three years
- **Overall cost ~$120 per year per septic system**

On-Site Management Program Costs: Private-Public

- Estimated time commitment for the District
  - Program staff: 1 hr per client per year
  - Supervisory time: 2 hr per week
- Fixed costs include twice per year mailouts of septic tank operation educational material
- Clean-out and inspection estimated at $200 once every three years (a little cheaper than private-private option)
- **Overall cost ~$120 per year per septic system**

Public Education Programs

- Assist home owners with proper care and maintenance of their septic systems
  - Capital Regional District
  - Regional District of Nanaimo
  - Nova Scotia Environment
- Multi-media based approaches (Internet, Cable TV, newspapers, workshops/ open houses), etc.

Public Education Programs cont'd

- Topics covered include the following:
  - Septic system care and maintenance
  - Water conservation
  - Alternative cleaning products
  - Maintenance record
  - Do's and Don'ts
  - Technical documents, etc…

Public Education Programs cont'd Capital Regional District

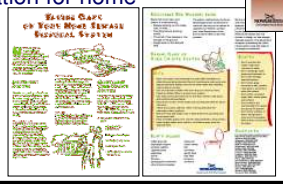
- Program titled "Septic Savvy"
  - Brochure
  - Website
  - Household information kit
  - Video clips
- Program development costs ~$50,000 (~27,000 septic systems)

Public Education Programs cont'd Regional District of Nanaimo

- Opted to not enter into on-site management program
- Instead, recently developed "SepticSmart" program
  - Household information kit
  - Open houses and workshops
  - Plans to add information to website
- Program development costs ~$25,000 (~12,000 septic systems) funded via increase in septage tipping fees

Public Education Programs cont'd Nova Scotia Environment

- Education program on website
  - Technical documents
  - Information for home owners



Summary

- On-site system management program could prevent problems
  - Ensures that inspections and maintenance are done regularly
- Private-Private and Private-Public management options available
- Many factors to consider prior to implementing a management program

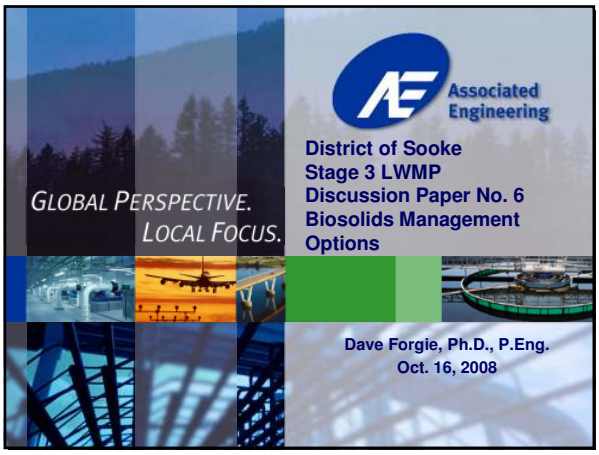
Summary cont'd

- A successful management program will include the following:
  - An education program for on-site system users
  - Inspection and maintenance of on-site systems at regular intervals
  - A record of each on-site system in a database and its condition, pump-out history, etc.

Recommendations

- The District should develop and implement a septic tank education program based on the CRD model
- If the District opts for a septic tank management program, the Private-Private model should be used (similar to the CRD system)

Discussion/Questions?



Outline

- Background
- Current Practises
- Options
- Conclusions

Background

- LWMP should address fate of residuals from the plant, e.g. dewatered biosolids
- Stage 2 LWMP did not address this because treatment plant was not built (or operating then)
- MoE's Dec. 2007 Stage 2 LWMP approval letter → requirement to review biosolids management, including beneficial reuse

Background (cont'd)

- Biosolids in question include the following:
  - Solids from septic tank pump-outs
    - not truly biosolids because they have not been digested
  - Biosolids from aerobic digestion of waste biological sludges from secondary treatment plants
    - Includes main District plant

Current Practises

- SPL Wastewater Recovery Center Inc. (Langford, BC)
  - Receives septic tank pump-outs and small secondary plant sludges
  - Solids go to landfill
- District of Sooke WWTP (operated by Epcor)
  - Dewatered digested biosolids and screenings go to landfill
- Landfill = CRD's Hartland Ave. facility

Options for Dewatered Biosolids

- Land application for agriculture and / or silviculture (forestry)
- Composting for subsequent use in landscaping, agricultural or forestry sectors
- Use as renewable energy fuel to offset use of fossil fuels

Land Application

- Dewatered biosolids are similar to a slow release low strength fertilizer
- Land application is governed by the Organic Matter Recycling Regulation (OMRR)
- Options include the following:
  - Forestry
  - Agriculture
  - Mine reclamation
- Forestry and mine reclamation have some potential based on recent CRD-related study

Land Application Issues

- Concerns about contaminants in biosolids
  - Endocrine disrupting chemicals (EDCs)
  - Pharmaceuticals and personal care products (PPCPs)
- Concerns about pathogens
- Concerns about odours

Composting

- Composting is also governed by OMRR in BC
- Composting is aerobic stabilization of organics (dewatered biosolids) and a bulking agent (woody debris/chips)
- Multi-stage (Primary, Secondary)
- Final Product is very similar to rich top soil
- Markets include landscaping and gardening

Composting Alternatives

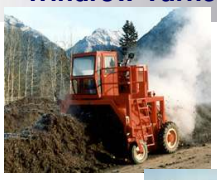
- Windrow
- Aerated static pile
- The GORE™/fabric process
- Horizontal-agitated bed
- In-vessel

Mixing/Turning Compost with Front End Loaders

Mix Boxes

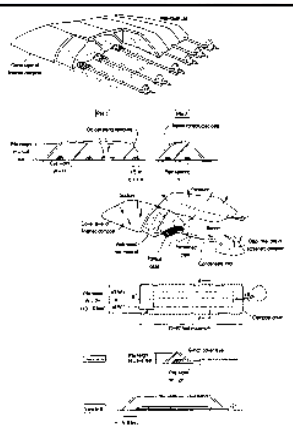
Exposed Windrow

Windrow Turners



Windrow in a building

Aerated Static Pile (ASP)



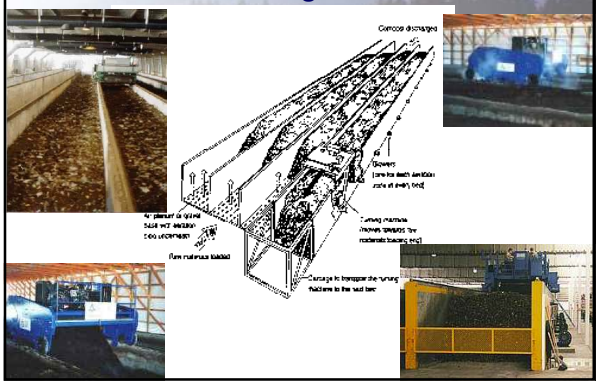
Aerated Static Pile (ASP)

EASP Aeration Zones

ASP "Bin Wall" Building

The GORE™/Fabric Process

Horizontal Agitated Bed



In-vessel/Containerized

Composting (cont'd)

- Successful composting facilities include Comox Valley RD and Cities of Kelowna and Vernon
- Island commercial composting facilities
  - Fisher Road Recycling (Cobble Hill)
  - International Composting (Nanaimo)
- Comox Valley RD composting costs ~$123 per m^3 of dewatered sludge
- Fisher Road Recycling would charge ~$110 per tonne of dewatered biosolids

Potential Fuel Source

- Dried wastewater treatment plant sludges and biosolids are similar to soft coals in calorific value
- Dried biosolids do not add CO_2 to the atmosphere when burned
- Large coal consumers such as cement kilns can use dried biosolids as a green coal substitute

Potential Fuel Source (cont'd)

- Sooke is too small on its own to interest a cement manufacturer
- Solid fuel (pellet-type) boilers
  - Could be used to burn dried biosolids → heat and hot water for local use
    - Form of integrated resource management

Conclusions

- Land application to forestry lands and gravel pits has some potential
- Composting could have some potential based on other successes
- Use as a fuel is unlikely unless part of a CRD program (yet to be developed)
- Keep options open and look for opportunities to divert from landfill

Discussion / Questions?

DISTRICT OF SOOKE

Liquid Waste Management Plan (Sanitary), Stage 3 Advisory Committee

Meeting # 4 – January 22, 2009
1:00 PM – Council Chambers
2225 Otter Point Road

Committee Members Present:

Dave McClimon, Community Representative
Tammi Wetmore, EPCOR
John Reynolds, EPCOR

District Staff

Lisa Urlacher, Council Clerk
Al Fontes, Acting Director of Engineering
Laura Byrne, Engineering Technologist

Consultant

Dave Forgie, Associated Engineering Ltd.

Absent

Cindy Walsh, Officer, Ministry of Environment
T'Sou-ke Nation Representative
Alan Deslile, T'Sou-ke Nation Consultant
Michael Riefman, Vancouver Island Health Authority
Councillor Ron Dumont
Rod Vowels, Community Representative
Peter Law, Ministry of Environment
William Norton, Community Representative
Julia Brydon, Environment Canada
Chris Jensen, Ministry of Community Services
Blake Medlar, Ministry of Environment
Russ Chipps, Beecher Bay Nation

Information Only

Eric Lund, Juan de Fuca Electoral Area Director
Dave Drummond, CAO Metchosin

Action

The meeting began at 1:06 p.m.

1. **Approval of Agenda:**

The agenda was approved with the addition of discussions as to the regulation of discharging sewage into the harbour.

2. **Adoption of Minutes:**

The minutes of September 18, 2008 were approved as amended on page 2.

3. **New Business:**

The committee discussed the jurisdiction of the Sooke Harbour and basin and asked that the discussion be brought forward with information on the *Canadian Shipping Act*. A discussion ensued as to the location and operational requirements of a sani-dump. **Laura**

4. **Plan Monitoring Committee Terms of Reference**

The committee discussed the Terms of Reference and suggested that meetings in the first year should be every 3-4 months and twice a year thereafter. Staff will contact the CVRD and bring forward to the committee information on the CVRD process. The consultant overviewed the details as to how the committee would be structured and it was noted that recommendations going forward to Council would be the Engineer's responsibility who would provide a staff report detailing the options. It was noted that providing refreshments does not need to be documented within the Terms of Reference. **Laura**

5. **Draft Operational Certificate**

The consultant provided history as to the Municipal Sewer Registration (MSR) and explained that the Operational Certificate would replace the MSR.

Staff described Blake Medlar's explanation as to appeals and public consultation.

A discussion ensued as to the rate of discharge. Ms. Wetmore provided a detailed visual description of an average day and peak day flows within the plant and the outfall. It was decided that the consultant and Mr. McClimon would research the rate of discharge to use within Section 1.1 of the Operational Certificate. **Dave and Davie**

The EPCOR representatives provided an update on the success of the plant capacity during the heavy rainfall on January 7th, 2009.

It was noted that the toxicity test may be required within the MSR and it will be confirmed after receiving feedback from the Ministry of Environment. **Dave Forgie**

The EPCOR representatives provided information as to the proposed water re-use at the plant for wash down purposes and Mr. Forgie was asked to investigate the internal treatment standards and if it is required as an inclusion in the Operational Certificate.

6. **Implementation Plan**

Mr. Forgie overviewed the completed tasks.

A discussion ensued as to the committee's opinion regarding discharges into the Harbour and Basin. It was reaffirmed that there was to be no discharges into the Harbour and Basin or into watercourses leading into the Harbour and Basin.

The committee discussed the process of septic systems and the sensitivity of watershed and it was noted that there are controls in place for approval of septic systems.

The committee discussed on-stie septic systems management through a servicing bylaw and it was decided that a public-private program should be presented at the next public open house. **Staff**

The committee discussed the treatment plant capacity and the possibility of extending the sewer area. The committee requires environmental data to be incorporated so that the committee can rank the areas of environmental concerns for priorities for sewers. Staff will provide the data for the CRD and Ministry of Environment to Mr. Forgie. **Laura**

7. **Stage 3 LWMP progress and schedule**

Mr. Forgie advised that a draft plan should be available in March and that the pubic consultation would be held in April presenting components of the draft.

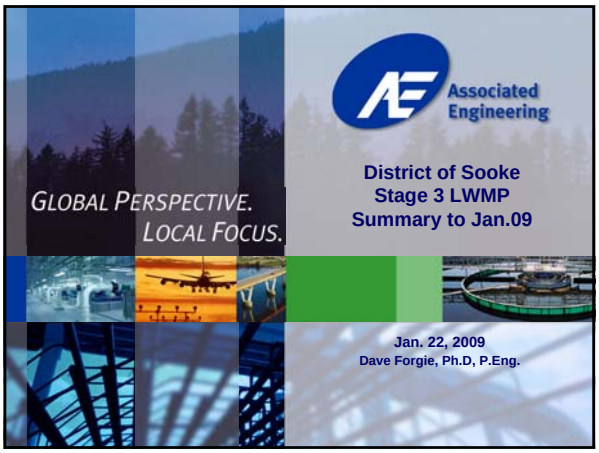
Next Meetings:

February 26, 2009 at 1:00 p.m. (tentative)
March 19, 2009 at 1:00 p.m.

Adjournment

The meeting was adjourned at 4:25 p.m.

Dave Mclimmon Chair	Evan Parliament, Chief Administrative Officer



DP1 Adding New Sewered Areas: Conclusions

- Guiding Principle for addition of new sewered areas should be they have to pay their fare share and not be subsidized by those in the existing SSA
- Only the areas to the north and west of the existing SSA are within reasonable economic reach of an expanded SSA

DP2 Satellite WWTP Effluent Stds Summary and Conclusions

- If discharge is to “embayed” waters, phosphorus removal will be required regardless.
- Reclaimed water standard will require additional treatment before creek discharge
- Secondary treatment will require outfalls to Sooke Basin or Harbour or Sooke Bay
- Discharge of secondary effluent to Sooke Harbour or Basin may not protect shellfish

DP2 Satellite WWTP Effluent Stds: Recommendations

- Maintain the Stage 2 recommendation for reclaimed water standards and add a requirement for additional treatment re: EDCs and PPCPs removal, for creek/stream discharge
- Only allow secondary treatment standard if the discharge is via outfall to open marine waters of Sooke Bay

DP3 Treatment options around Sooke Basin and Harbour: Summary and Conclusions

- Developers have three options to serve new areas, outside the SSA, to consider in their business plans:
  - Pay for connection to the SSA; negotiate additional capacity needs with the District
  - Satellite treatment (as per DP2)
  - On-site treatment (likely under Health)
- The District might want to require bonds and contact operation for all non-SSA collection and treatment systems

DP 4 Rainwater Management: Schedule

- Timeline for project completion
  - 1 year from contract signing
  - Contract was signed early May 2008
  - Based on info from Downstream Environmental Consulting Ltd.
- Contract may have to run longer because of District of Sooke staff changes

DP4 Rainwater Management: Budget

- Budget for completing Stage 2 and 3 LWMP (Rainwater) ~ $110,000
- As of October 8th, 2008
  - ~ 23% of work completed
  - ~ 23% of the budget expended
- At this point, it is assumed that funds will be adequate and that project will come in on budget

DP5 On-site System Management Options: Summary

- On-site system management program could prevent problems
  - Ensures that inspections and maintenance are done regularly
- Private-Private and Private-Public management options available
- Many factors to consider prior to implementing a management program

DP5 On-site System Management Options: Summary cont'd

- A successful management program will include the following:
  - An education program for on-site system users
  - Inspection and maintenance of on-site systems at regular intervals
  - A record of each on-site system in a database and its condition, pump-out history, etc.

DP5 On-site System Management Options: Recommendations

- The District should develop and implement a septic tank education program based on the CRD model
- If the District opts for a septic tank management program, the Private-Private model should be used (similar to the CRD system)

DP6 Biosolids Management Options: Conclusions

- Land application to forestry lands and gravel pits has some potential
- Composting could have some potential based on other successes
- Use as a fuel is unlikely unless part of a CRD program (yet to be developed)
- Keep options open and look for opportunities to divert from landfill

Actions Needed

We need firm decisions on:

1. Areas that are prioritized for annexation to SSA
2. Levels of treatment for satellite plants/ non-connected treatment
3. Type of On-site Treatment Management Program (or just education program?)
4. Biosolids Management directions, e.g. land application and/or composting

DISTRICT OF SOOKE

Liquid Waste Management Plan (Sanitary), Stage 3 Advisory Committee

Meeting # 5 – March 26, 2009
1:00 PM – Council Chambers
2225 Otter Point Road

Committee Members Present:

Dave McClimon, Community Representative
Tami Wetmore, EPCOR
John Reynolds, EPCOR
Blake Medlar, Ministry of Environment
Councillor Ron Dumont
Kerry McLean, T'Sou-ke Nation Representative

District Staff

Lisa Urlacher, Council Clerk
Al Fontes, Director of Engineering
Laura Byrne, Engineering Technologist
Gerald Christie, Director of Planning

Consultant

Dave Forgie, Associated Engineering Ltd.
Kelly Bush, Associated Engineering Ltd.

Absent

Cindy Walsh, Officer, Ministry of Environment
Alan Deslile, T'Sou-ke Nation Consultant
Michael Riefman, Vancouver Island Health Authority
Rod Vowels, Community Representative
Peter Law, Ministry of Environment
William Norton, Community Representative
Julia Brydon, Environment Canada
Chris Jensen, Ministry of Community Services
Russ Chipps, Beecher Bay Nation

Information Only

Mike Hicks - Juan de Fuca Electoral Area Director
Dave Drummond, CAO Metchosin

Action

The meeting began at 1:15 p.m.

1. **Approval of Agenda:**

   The agenda was approved.

2. **Adoption of Minutes:**

   The minutes of January 22, 2009 were approved as amended on page 2.

3. **Business Arising from the Minutes:**

   Mr. Forgie asked Mr. Medlar for guidance as to what flows should be included and how that impacted future increases in flow and fees within the Operational Certificate. Ms. Wetmore confirmed that the Municipal Sewer Registration was calculated at the maximum and that the plant was designed for a larger area. Mr. Medlar confirmed that the Operational Certificate should reflect the flows in future years.

   Mr. Forgie asked Mr. Medlar for clarification as to the requirements for re-claimed water use within the plant for wash-down purposes, Ms. Wetmore stated that there it was not defined or recognized in the Operational Certificate. Mr. Medlar stated that they are aware of the locations that are using reclaimed water and suggested that a request letter be sent to the Ministry. Mr. Forgie will send the request letter regarding internal treatment standards and inquire if it is required as an inclusion in the Operational Certificate. **Dave**

4. **Discussion Paper 7**: Priority Assessment for Sewering Catchment Areas

   Ms. Bush provided an overview of the rational to prioritize catchment areas for sewering and explained the economics (cost) and environmental concerns. Ms. Bush stated that the purpose was to assess priority areas for future inclusion in the Sewer Specified Area and to develop an approach using the estimated costs per single family equivalent and environment concern using surface water fecal coliform count.

   Ms. Bush explained that the catchment areas were defined by Stantec and presented in the discussion paper one; it was then quantified as an overall ranking based on cost and environmental concerns. Ms. Bush explained the environmental data which represented fecal coliform samples from previous years.

The overall ranking resulted in the following:

- Kaltasin and the flats
- Whiffin Spit South
- Silver Spray
- Grouse Nest
- Saseenos

The Committee discussed the sampling data and determined that there is new information that will become available that will distinguishes the non-human fecal coliform and that when the data is received a new environmental ranking should be provided because Silverspray and Grouse Nest may result in lower environmental concern. Laura will provide the consultant the new sample site information for the consultant to provide an updated ranking model. **Laura / Dave**

A discussion ensues regarding the Whiffin spit area and the consultant advised that they would meet with Stantec and EPCOR to determine more realist values of cost for the Whiffin Spit area. The committee agreed that the Whiffin Spit area should be combined. **Dave**

The Committee discussed the environmental testing and agreed that the areas that are ranked high for environmental concern should have more resources spent on data information. Mr. Medlar advised that Staff should consult with Rosie Barlak, Ministry of Environment and Brianne Czypyha, Stormwater, Harbours & Watersheds Program Environmental Services, CRD prior to any changes or modification to the service agreement. **Laura**

Ms. Bush summarized her presentation:

- Priority assessment ranked catchment areas to include in SSA based on economics and environmental concern
- Good candidates - Kaltasin and the Flats and Saseenos
- Less certain candidates – Whiffen Spit South, Silver Spray and Grouse Nest
- Addition of Saseenos – close to Kaltasin and the Flats, easier to include Grouse Nest in SSA
- Silver Spray cannot be added without Whiffen Spit South Homeowners decision needed

5. **Appendix H – Draft Bylaws**

The Committee reviewed the draft bylaws regarding:

- the regulation of Wastewater Treatment Plant Effluent in the District of Sooke;
- a service to Develop and Implement a Management Program for Onsite Sewage Systems;
- and the Maintenance of Onsite Sewage Systems in the District of Sooke.

After discussion the Committee agreed to implement an education program and monitor the “hotspots” for a period of three years and at that time bring forward the draft bylaws for review.

6. **Stage 3 LWMP Report**

Mr. Forgie overviewed the following:

- Stage 3 Tasks
- Summary of the 7 Discussion Papers (DPs) with "Actions"
- LWMP Monitoring Committee
- Public Consultation
- Operational Certificate
- Implementation Plan

Mr. Forgie explained that the discussion papers would be submitted to the Ministry of Environment as a complete document and that the draft would be available at the Open House in early May.

The Committee reviewed the action item for Discussion paper one as to the considerations for adding new sewered areas to the District of Sooke SSA:

- Develop bylaw that specifies how users in newly sewered areas will pay for capacity to service wastewater treatment

Staff advised that a bylaw and policy were adopted in 2008. Mr. Forgie asked that staff forward a copy of Policy 11.5, *Sooke Core Area Local Service Area Boundary Policy* and Bylaw No. 374, *Sooke Core Sewer Specified Area Mandatory Connection Amendment Bylaw (281-2)* and Bylaw No. 373, *Subdivision and Development Standards Amendment Bylaw (65-7)* Note: both amendments have been consolidated into the respective Bylaws. **Laura**

The Committee reviewed the action items for discussion paper two as to satellite treatment plant effluent standards:

- District develop bylaw prohibiting direct discharges from satellite treatment plants to Sooke Harbour or Sooke Basin or tributaries
- Draft discharge control bylaw prepared

It was noted that "Satellite Treatment" should be included in the maintenance schedule and to include the requirement of a bond equivalent to 3 years maintenance. **Dave**

The Committee reviewed the action items for discussion paper three as to treatment options for areas around Sooke Basin and Harbour:

- District develop and implement set protocols for review and evaluation of developer proposals
- Draft discharge control bylaw prepared

The Committee reviewed the action item for discussion paper four as to rainwater management plan: scope, budget and schedule:

- Continue with development of LWMP (Rainwater) consistent with guiding principles of sustainability and meets Ministry of Environment guidelines

Mr. Medlar clarified that the "stormwater" plan needs to be incorporated prior to submitting the final report to the Ministry of Environment.

The Committee reviewed the action items for discussion paper five as to On-Site System Management options:

- Implement regulated maintenance program for private on-site septic systems, such as public education program, bylaw or both
- Draft bylaws prepared

After discussion a compromise was met to implement an education program and bring forward the draft bylaws after 3 years of monitoring the "hot spots" during the education program.

The Committee asked staff to bring forward an inventory of septic field within the District of Sooke. **Laura**
The Committee asked that staff contact the Regional District of Nanaimo regarding their educational material "Smart Septic". **Laura**

The Committee discussed the District of Sooke receiving septic truck effluent into the Sooke Treatment Plant and a Boat/RV station to be received at the Sooke Treatment Plant. Mr. Medlar provided guidance as to identifying a pump out station in the plan.

The Committee reviewed the action item for discussion paper six as to the investigation of beneficial reuse of septage and treatment plant biosolids:

- Develop biosolids management program
- Recommended options for management of District's biosolids
    - Composting at existing facility (e.g. CVRD)
    - Land application for reforestation

The Committee reviewed discussion paper seven and agreed that prior to confirming the preferred order of catchment areas to be included in SSA the consultant would bring forward a revised ranking model for consideration and that in the future the Draft Bylaw in Appendix H require re-evaluation. **Dave** **Staff**

The Committee discussed the creation of a LWMP Committee to monitor progress and success of implementation of approved LWMP And that a Draft Terms of Reference be developed for:

- Purpose of the committee
- Proposed committee activities
- Make up of the LWMP Monitoring Committee
- Operation of the committee

It was suggested that the LWMP monitoring committee could include an Environmental Roundtable approach similar to the CRD, which would include a larger scope of discussion. Staff noted this option. **Laura**

The Committee discussed the public consultation process, Ms. Byrne referred to a letter as to the rainwater component and the requirement of the Ministry of Environment. Mr. Forgie asked staff to forward the letter to him. **Laura**

Mr. Forgie explained the Operational Certificate

- Draft Operational Certificate prepared as part of Stage 3 LWMP
- Operational Certificate will replace current registration under Municipal Sewage Regulation

Mr. Forgie provided an overall summery of the action items recommended for implementation:

- Develop bylaw specifying how users in newly sewered areas will pay for capacity to service treatment of wastewater
- Develop bylaw prohibiting direct discharges from satellite treatment plants to Sooke Harbour or Sooke Basin or tributaries
- Develop and implement protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside SSA
- Continue development of LWMP (Rainwater) Stage 2 and Stage 3 consistent with guiding principles and meets requirements of MoE
- Implement regulated maintenance program for private on-site septic systems such as development of public education program and bylaws
- Develop biosolids management program for beneficial reuse of septic tank and wastewater treatment plant biosolids
- Confirm preferred order of catchment areas for future inclusion in SSA

Mr. Medlar provided guidance as to:

- Stage 3 report is a summary document that rolls up Stage 1 and Stage 2 (Sanitary)
- Topics to be addressed in the final report are; source control, inflow/infiltration, treatment, biosolids, public consultation, on-site treatment
- Implementation schedule and detailed financing
- An overview of the community planning demonstrating a link to the OCP and rainwater plans
- Innovative trendsetters

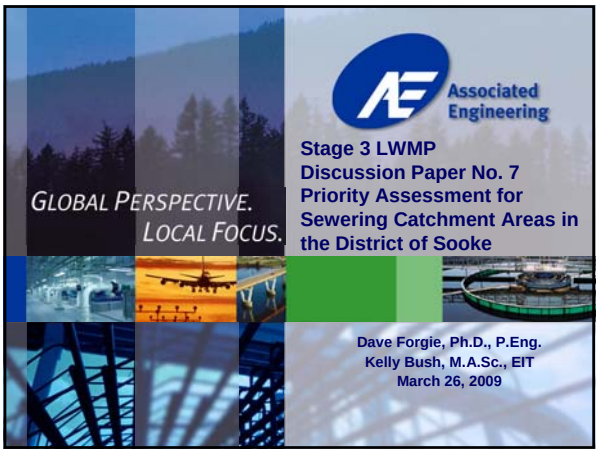
Next Meetings:

TBA

Adjournment

The meeting was adjourned at 4:35 p.m.

Dave Mclimmon Chair	Evan Parliament, Chief Administrative Officer



Outline

- Introduction
- Approach
- Results
- Summary

2

Introduction

- Suggested by Stage 3 (Sanitary) Advisory Committee during LWMP process
- Method needed to prioritize catchment areas for sewering
- Approach should consider
  - Economics (cost)
  - Environmental concerns

3

Purpose of DP7

- To assess priority areas for future inclusion in the Specified Sewer Area (SSA)
- Develop approach using the following:
  - **Estimated costs** of sewering catchment area with treatment (per single family equivalent, SFE)
  - **Environmental concern** using surface water fecal coliform concentrations as surrogate

4

Approach

- Catchment areas based on definitions by Stantec and those presented in DP1
- Priority for sewering areas quantified → **Overall Ranking** based on
  - Economic ranking
  - Environmental ranking

5

Economic Ranking

- Total cost with future sewering and wastewater treatment per single family equivalent (SFE) extracted from DP1
- Lowest cost = high score = 10 (Good!)
- Highest cost = low score = 0
- Costs in between = linear scale
- Economic scores were ranked → **Economic Ranking**

6

Environmental Ranking

- District of Sooke provided fecal coliform (FC) data (1997 to 2008)
  - 2006 to 2008 data used to represent recent sewering
- Environmental concern proportional to FCs
  - i.e., a high FC value indicated problems with septic systems
- For each sampling site, maximum FC concentrations were extracted
- Maximum FC values were averaged to get one FC value per catchment area

7

Environmental Ranking (cont'd)

- Large difference in FC values accommodated by log10
  - E.g. log10 of 10,000 FC/100 mL = 4
- Lowest FC value = low score = 0 (Good!)
- Highest FC value = high score = 10
- Linear scores between 1 and 10 based on log10 of FC values
- Environmental scores were ranked → **Environmental Ranking**

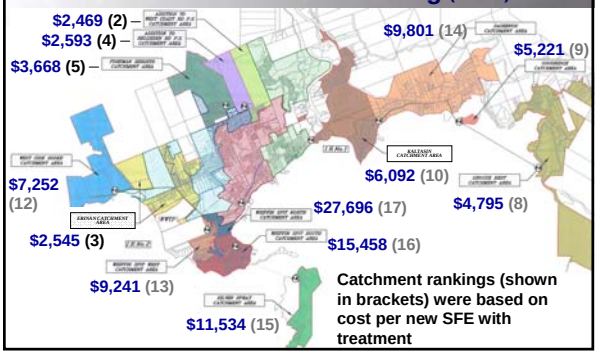
8

Results – Economic Ranking

- Based on economics alone
- 5 lowest costs
  - Helgesen Road
  - West Coast Road
  - Erinan
  - Additions to Helgesen Road
  - Foreman Heights

9

Results - Economic Ranking (cont'd)



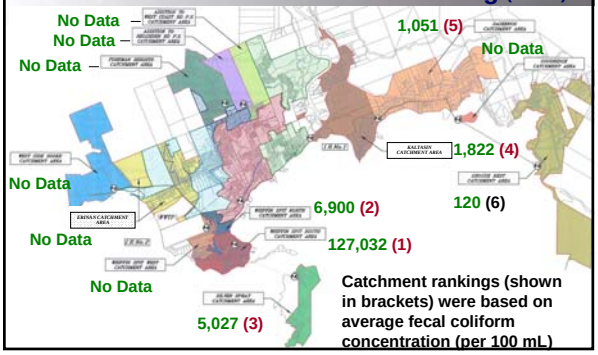
Catchment rankings (shown in brackets) were based on cost per new SFE with treatment

Results – Environmental Ranking

- Based on environmental concerns alone
- 5 highest based on FC concentrations:
  - Whiffin Spit South
  - Whiffin Spit North
  - Silver Spray
  - Kaltasin
  - Saseenos

11

Results - Environmental Ranking (cont'd)



Catchment rankings (shown in brackets) were based on average fecal coliform concentration (per 100 mL)

Overall Ranking

- 3 weighting scenarios used
  - 1:1 – economics : environmental
  - 1:2 – economics : environmental
  - 2:1 – economics : environmental
- 3 "weighted" economic and environmental ranks added together → **Overall Ranking**

13

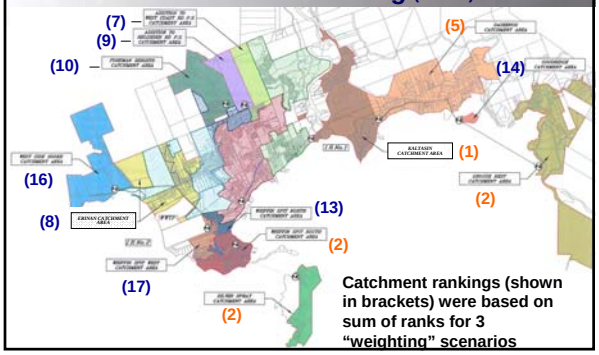
Results – Overall Ranking

- Ranks for each of 3 "weighting" scenarios added together for each catchment → Sum of Ranks
- Sum of Ranks were then ranked where lowest Sum of Rank = No. 1 ranking
- 5 highest priority areas for sewering
  - Kaltasin
  - Whiffin Spit South
  - Silver Spray
  - Grouse Nest
  - Saseenos

3-way tie

14

Results - Overall Ranking (cont'd)



Catchment rankings (shown in brackets) were based on sum of ranks for 3 "weighting" scenarios

Summary

- Priority assessment ranked catchment areas to include in SSA based on economics and environmental concern
- Good candidates - Kaltasin and Saseenos
- Less certain candidates – Whiffin Spit South, Silver Spray and Grouse Nest

16

Summary (cont'd)

- Addition of Saseenos – close to Kaltasin, easier to include Grouse Nest in SSA
- Silver Spray cannot be added without Whiffin Spit South
  - Homeowners decision needed

17

Questions?

18

Example – Kaltasin

- **Economic Ranking**
  - Cost of treatment: $6,092
  - Score = 8.4 (10 = low $, 0 = high $)
  - Rank = 10 out of 17
- **Environmental Ranking**
  - Average FC: 1,822 col/100 mL
  - Score = 6.4 (10 = high FC, 0 = low FC)
  - Rank = 4 out of 17

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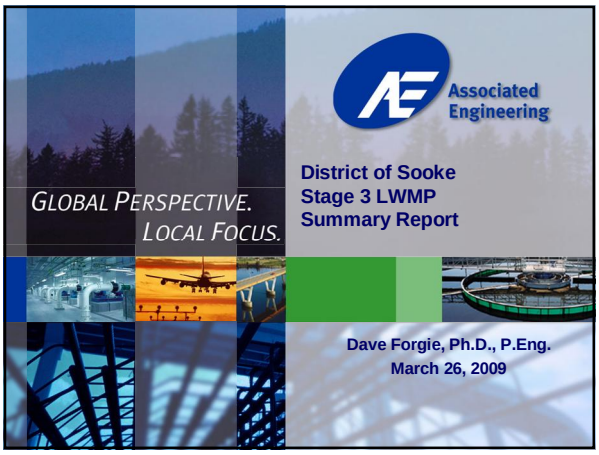
Example – Kaltasin (cont'd)

- **Overall Ranking**
  - Economic score = 8.4
  - Environmental score = 6.4
- 1:1 weighting: 8.4 + 6.4 = 14.8 **(Rank =1)**
- 1:2 weighting: 8.4 + (2 × 6.4) = 21.2 **(Rank = 2)**
- 2:1 weighting: (2 × 8.4) + 6.4 = 23.2 **(Rank = 1)**
- **Sum of Ranks = 4**
- **Overall Ranking = 1 out of 17**

20



Outline of Stage 3 LWMP Report

- Introduction
- Stage 3 Tasks
- Summary of 7 Discussion Papers (DPs) with "Actions"
- LWMP Monitoring Committee
- Public Consultation
- Operational Certificate
- Implementation Plan
- Overall Summary and Recommendations

2

Introduction

- 1990s - deteriorating water quality of Sooke River, Sooke Harbour, Sooke Basin and tributaries
  - Failing septic systems
  - Poor soil conditions
  - High groundwater tables
- **$22 million** program to sewer the District's Core Area with secondary wastewater treatment

3

Introduction (cont'd)

- District's 3-stage Liquid Waste Management Plan (LWMPs) process
  - "**Stage 1 LWMP** equivalent studies" – Completed
  - **Stage 2 LWMP** – Completed in October 2005 and approved by Ministry of Environment (MoE) in December 2007
  - **Stage 3 LWMP** – On-going since June 2008

4

Stage 3 Tasks

- Part of Stage 2 LWMP approval by MoE in December 2007
- 22 tasks outlined
- Most tasks completed through series of 7 discussion papers (DPs)

5

DP1 – Considerations for Adding New Sewered Areas to the District of Sooke SSA

- Examined payment options and economical feasibility of expansion of Specified Sewer Area (SSA)
- Guiding principle
  - Existing SSA users do not pay more than they already pay
  - New users pay their fair share

6

DP1 – Considerations for Adding New Sewered Areas to the District of Sooke SSA (cont'd)

- Areas most economically feasible for SSA expansion:
  - Erinan catchment
  - Addition to West Coast Rd. catchment
  - Addition to Helgesen Road
  - Foreman Heights catchment
- **Action**
  - Develop bylaw that specifies how users in newly sewered areas will pay for capacity to service wastewater treatment

7

DP2 – Satellite Treatment Plant Effluent Standards

- Examined options to maintain reclaimed water quality standard or secondary treatment standard for effluent
- Reclaimed effluent standard
  - Avoid need for outfalls
  - Phosphorous removal for discharges ending up in Sooke Harbour or Basin
  - Advanced treatment needed for discharges to creeks
- Secondary effluent standard
  - Effluent discharged via outfalls to Sooke Bay (long, $$$$ outfall)

8

DP2 – Satellite Treatment Plant Effluent Standards (cont'd)

- Recommend reclaimed water quality standard
  - Add phosphorous removal
  - Possibly other advanced treatment (AOP, wetlands) prior to discharge
- **Action**
  - District develop bylaw prohibiting direct discharges from satellite treatment plants to Sooke Harbour or Sooke Basin or tributaries
  - Draft discharge control bylaw prepared

9

DP3 – Treatment Options for Areas Around Sooke Basin and Harbour

- Areas outside SSA use on-site treatment with ground disposal
- SSA expansion cost varies from area to area
- Examined 3 wastewater treatment options for new developments outside SSA
  - Expansion of SSA to include area in question
  - Satellite treatment plants and appropriate disposal
  - On-site treatment

10

DP3 – Treatment Options for Areas Around Sooke Basin and Harbour (cont'd)

- Onus on developer to evaluate treatment options for size and number of lots
- **Action**
  - District develop and implement set protocols for review and evaluation of developer proposals
  - Draft discharge control bylaw prepared

11

DP4 – Rainwater Management Plan: Scope, Budget and Schedule

- Running in parallel LWMP (Wastewater) is 3-stage LWMP (Rainwater)
  - Stage 1 approved by MoE in February 2008
  - Stage 2 (on-going)
  - Stage 3 (forthcoming)
- Requirements for LMWP (Rainwater)
  - Terms of Reference
  - Budget
  - Schedule

12

DP4 – Rainwater Management Plan: Scope, Budget and Schedule (cont'd)

- Plan will incorporate
  - Provincial objectives and principles of sustainability
  - Input from municipal planning and engineering
  - Investigations of 71 recommendations outlined in District's LWMP (Stormwater) Stage 1
- **Action**
  - Continue with development of LWMP (Rainwater) consistent with guiding principles of sustainability and meets MoE requirements

DP5 – On-Site System Management Options

- "Private-Private"
  - **Privately** owned and maintained on-site systems and **privately**-operated inspection program
- "Private-Public"
  - **Privately** owned and maintained on-site systems and **publicly**-operated inspection program

DP5 – On-Site System Management Options (cont'd)

- Management program should include
  - Public education program (e.g. CRD, RDN)
  - Regular inspection and maintenance of on-site systems
  - Records of each on-site system
- **Action**
  - Implement regulated maintenance program for private on-site septic systems, such as public education program, bylaw or both
  - Draft bylaws prepared

DP6 – Investigation of Beneficial Reuse of Septage and Treatment Plant Biosolids

- District's biosolids are currently disposed to landfill without direct reuse
- Options for beneficial reuse of biosolids
  - Land application in forestry industry
  - Composting
  - Fuel source in solid fuel boiler

DP6 – Investigation of Beneficial Reuse of Septage and Treatment Plant Biosolids (cont'd)

- **Action**
  - Develop biosolids management program
  - Recommended options for management of District's biosolids
    - Composting at existing facility (e.g. CVRD)
    - Land application for reforestation

DP7 – Priority Assessment for Sewering Catchment Areas in the District of Sooke

- Suggested by LWMP Advisory Committee
- Prioritization (scoring and ranking) approach developed for catchment areas using
  - Economics (cost) of sewering areas
  - Environmental concern – surface water fecal coliform concentrations

DP7 – Priority Assessment for Sewering Catchment Areas in the District of Sooke (cont'd)

- Priority areas for sewering
  - Kaltasin – Good candidate
  - Whiffin Spit South
  - Silver Spray
  - Grouse Nest
  - Saseenos

  } 3-way tie
- **Action**
  - Confirm preferred order of catchment areas to be included in SSA in the future

19

LWMP Monitoring Committee

- Will be formed to monitor progress and success of implementation of approved LWMP
- Draft Terms of Reference developed
  - Purpose of the committee
  - Proposed committee activities
  - Make up of the LWMP Monitoring Committee
  - Operation of the committee

20

Public Consultation

- Advisory Committee (Sanitary) (ACS) Meetings
  - On-going throughout Stage 3
    - First meeting held in June 2008
  - 5 ACS meetings held to date (inclusive)
- Public Communication
  - Public Open House scheduled for **April 16, 2009**

21

Operational Certificate

- Draft Operational Certificate prepared as part of Stage 3 LWMP
- Operational Certificate will replace current registration under Municipal Sewage Regulation

22

Implementation Plan

- To be developed following confirmation and/or approval of **actions** recommended in this report

23

Overall Summary & Recommendations

- District has completed Stage 1 and Stage 2 of the LWMP
- Stage 3 of LWMP used information developed in previous Stages
  - Refine wastewater management options and costs
  - Develop implementation plan for LWMP
- Series of 7 DPs presented and discussed

24

Overall Summary & Recommendations
(cont'd)

- The following action items are recommended for implementation:
  - Develop bylaw specifying how users in newly sewered areas will pay for capacity to service treatment of wastewater
  - Develop bylaw prohibiting direct discharges from satellite treatment plants to Sooke Harbour or Sooke Basin or tributaries
  - Develop and implement protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside SSA

25

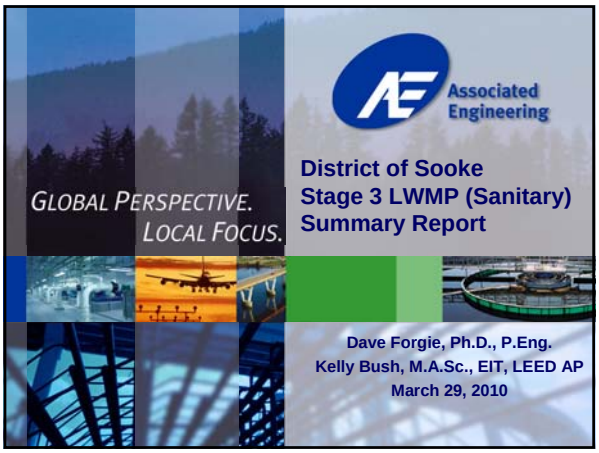
Overall Summary & Recommendations
(cont'd)

- Continue development of LWMP (Rainwater) Stage 2 and Stage 3 consistent with guiding principles and meets requirements of MoE
- Implement regulated maintenance program for private on-site septic systems such as development of public education program and bylaws
- Develop biosolids management program for beneficial reuse of septic tank and wastewater treatment plant biosolids
- Confirm preferred order of catchment areas for future inclusion in SSA

26

Questions?

27



Outline of Stage 3 LWMP Report

- Introduction
- Stage 3 Tasks
- Summary of 7 Discussion Papers (DPs)
- LWMP Monitoring Committee Terms of Reference
- Public Consultation
- Operational Certificate
- Overall Summary and Recommendations
- Implementation Plan

2

Introduction

- District's 3-stage LWMP (Sanitary) process
  - "**Stage 1 LWMP** equivalent studies" – Completed prior to 2002
  - **Stage 2 LWMP** – Completed in October 2005 and approved by Ministry of Environment (MoE) in December 2007
  - **Stage 3 LWMP** – On-going since June 2008 (with LWMP (Rainwater) Stg's 2 and 3 in parallel)

3

Stage 3 Tasks

- Part of Stage 2 LWMP approval by MoE in December 2007
- 22 tasks outlined, all completed.
- Most tasks completed through series of 7 discussion papers (DPs)

4

The Discussion Papers

- DP1 – Considerations for Adding New Sewered Areas to the District of Sooke SSA
- DP2 – Satellite Treatment Plant Effluent Standards
- DP3 – Treatment Options for Areas Around Sooke Basin and Harbour
- DP4 – Rainwater Management Plan: Scope, Budget and Schedule
- DP5 – On-Site System Management Options
- DP6 – Investigation of Beneficial Reuse of Septage and Treatment Plant Biosolids
- DP7 – Priority Assessment for Sewering Catchment Areas in the District of Sooke

5

LWMP Monitoring Committee

- Will be formed to monitor progress and success of implementation of the approved LWMP (Sanitary and Rainwater)
- Draft Terms of Reference developed
  - Purpose of the committee
  - Proposed committee activities
  - Make up of the LWMP Monitoring Committee
  - Operation of the committee

6

Public Consultation

- Advisory Committee (Sanitary) (ACS) Meetings
  - On-going throughout Stage 3
    - First meeting held in June 2008
  - 5 ACS meetings held to date
- Public Communication:
  - Public Open Houses:
    - **September 2008**
    - **April 2009**
    - **November 2009**

7

Operational Certificate

- Draft Operational Certificate prepared as part of Stage 3 LWMP
- Operational Certificate will replace the current Municipal Sewage Regulation (MSR) registration

8

Overall Summary & Recommendations

- Stage 3 of LWMP (Sanitary) used information developed in previous Stages
  - Refine wastewater management options and costs
  - Develop implementation plan for LWMP
- Series of 7 DPs presented and discussed

9

Recommendations (Sanitary)

- The District commit to maintaining user payment policies/bylaws that ensure existing SSA users do not pay more than they are already paying and that any new users, either through in-fill or SSA expansion, pay their fair share of both the capital and operating costs of the wastewater collection and treatment system.
- The District commit to developing a bylaw prohibiting direct discharges from satellite treatment plants to Sooke Harbour or Sooke Basin. The following options are recommended for the District for disposal of satellite treatment plant effluent:
  - Open marine outfall to Sooke Bay,
  - Approved discharge to ground, or
  - Connection to sewer system using a "user-pay" basis.
- The District set protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside of the SSA.

10

Recommendations (Sanitary) cont'd

- The District commit to continue with development and implementation of a LWMP (Rainwater) Stage 2 and Stage 3 that is consistent with guiding principles for stormwater planning and meets the guidelines of the MoE.
- The District commit to implementing a regulated maintenance program for private on-site septic systems within the District. The following options are recommended for the District for a regulated maintenance strategy for private on-site treatment systems:
  - Develop and implement a public education program;
  - Conduct an inventory of existing septic systems within the District;
  - Identify and monitor water quality "hotspots" within the District; and
  - After three years, review the impact of the public education program on water quality "hotspots". At which time, the need to develop a bylaw regulating maintenance of on-site septic systems should be reviewed.

11

Recommendations (Sanitary) cont'd

- The District, with its treatment plant operator, develop a biosolids management program for beneficial reuse of septic tank and wastewater treatment plant biosolids. The following options are recommended for the District's biosolids management program:
  - Composting of biosolids at an existing facility on Vancouver Island, such as the Fisher Road facility in the Cowichan Valley Regional District or at another approved facility,
  - Land application of biosolids for use in reforestation situations.
- The District commit to confirming the preferred order of catchment areas to be included in the SSA in the future. The preferred order of catchment areas could vary based on on-going environmental monitoring activities and the priorities of the District. At this point, of the two highest ranked candidate areas, Whiffin Spit North and Kaltasin, the Kaltasin area is the preferred candidate for the next expansion of the Sewer Specified Area (SSA). This list should be revisited on a five year basis to determine which areas are in greatest need of connection.

12

Implementation Plan (Sanitary)

Plan Activity	Estimated Additional Costs	Implementation Schedule	Status
Development and adoption of a bylaw to ban discharge of wastewater treatment plants to Sooke Harbour, Sooke Basin or any of their tributaries.	$20,000 or approximately $4 per SFE[1]	2010	In Progress, Draft Bylaw 404
Development of protocols for review and evaluation of developer proposals for wastewater treatment strategies for developments outside of the SSA[2].	$20,000 or approximately $4 per SFE	2010	In progress
Investigation of biosolids disposal options.	$40,000 or approximately $8 per SFE	Investigation 2010, implementation 2011	Pending
Development and implementation of a septic tank inventory and education program.	$40,000 or approximately $8 per SFE	Investigation 2010, implementation 2011 and review in 2014	Pending
Preliminary design of the Kaltasin area sewering project including refinement of costs and determination of availability of grants.	$80,000 or approximately $61 per affected SFE (about 1310 SFEs in the catchment area)	2010	Pending
Implementation and construction of the Kaltasin sewering project.	Current estimate is about $9200 per affected SFE	2011	To be started after the preliminary design study
Review of the next areas to be sewered, after the implementation of the Kaltasin sewering project.	$20,000 or approximately $4 per SFE	2012	
Review of the LWMP.	$40,000 or approximately $8 per SFE	2015	

[1]Single Family Equivalent
[2] Sewer Specified Area

13

Questions?

14

K Appendix K - Public Open House Information

District of Sooke

COMMUNITY OPEN HOUSE

May 6, 2009

MUNICIPAL HALL

D0 YOU HAVE QUESTIONS ABOUT YOUR COMMUNITY?

The District of Sooke SPRING COMMUNITY OPEN HOUSE will be held on May 6th, 2009 in the Council Chambers, Municipal Hall. Sooke residents will have an opportunity to talk to Council and Staff on current municipal projects and initiatives:

Official Community Plan Review
Spirit Square Design
Town Centre Plan
Liquid Waste Management Plan
2009 Property Tax
2009 Annual Report
Protective and Emergency Services

Everyone is welcome to drop in to this informal open house – further information will be available on our website www.sooke.ca and at the municipal hall.

Date:	Wednesday, May 6th, 2009
Time:	4:00 pm to 8:00 pm
Place:	COUNCIL CHAMBERS, MUNICIPAL HALL 2205 Otter Point Road
Contact:	District of Sooke Tel: 642-1634 Fax: 642-0541 Email: info@sooke.ca

Council is asking the public for comments and suggestions on proposed plans; members of the public may also make submissions by email, fax, or in writing to the Municipal Hall.

District of Sooke

2205 Otter Point Road, Sooke
Phone: 642-1634 Fax: 642-0541
email: info@sooke.ca
website: www.sooke.ca

UPCOMING PUBLIC MEETINGS

Special Council - Public Input Meeting Grant Road West Road Closure Bylaw

Monday, May 4, 2009 at 6:30 pm

Committee of the Whole

Monday, May 4, 2009 at 8:00 pm

Protective Services Committee

Tuesday, May 5, 2009 at 1:00 pm

Community Open House - SEAPARC Leisure Complex

Wednesday, May 6, 2009 from 4 pm – 8 pm

This schedule is subject to change. Please call 642-1634 to confirm meetings.
Council meeting agendas may be viewed at www.sooke.ca.

District of Sooke
Stage 3 Liquid Waste Management Plan
Background

- Liquid Waste Management Plans (LWMPs) are a three-stage process
  - **Stage 1** (completed 1976 - 2002) involved studies investigating solutions to the District's wastewater management issues related to septic tank systems. This stage resulted in a $22 million project to sewer the Core Area and to provide secondary wastewater treatment.
  - **Stage 2** (completed in 2005) evaluated questions related to wastewater management options for the District for the areas outside the Core Area.
  - **Stage 3** (underway since June 2008) uses information developed in Stage 1 and Stage 2 to refine wastewater management options and costs and to develop an implementation plan for the LWMP.
- In 2006, sewering of the District of Sooke's Core Area was completed
- In 2007, the District's Stage 2 LWMP was approved by the Ministry of Environment (MoE)
  - Stage 3 LWMP tasks were based on recommendations made by MoE upon approval of Stage 2 LWMP
- In May 2008, the conceptual design report for sewering areas outside the Core Area was completed by Stantec

Findings of Stage 2 LWMP

- Very few areas have optimal conditions for on-site septic tank disposal systems
- Areas with low likelihood of suitable soils for on-site treatment should have a minimum lot size of 1 ha (2.47 acres)
- Housing lots for other areas should require additional land for a second septic tank disposal field
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Considerations for Adding New Sewered Areas

- Ensure that existing users do not pay more than they already pay, while new users pay their fair share
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  - Erinan Catchment
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  - Addition to Helgesen Rd.
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- Recommend use of reclaimed water quality standard
  - Add phosphorous removal
  - Possibly other advanced treatment prior to discharge
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Treatment Options for Areas Around Sooke Basin and Harbour

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Stage 3 LWMP Studies (cont'd)

Rainwater Management Plan

- On-going in parallel with Stage 3 LWMP
- To be completed in 2009

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- Implement public education program
- Identify and monitor "hotspots" of environmental concern
- Review success in eliminating "hotspots"
- Implement formal management program (if needed) to ensure septic tanks are regularly pumped out and inspected

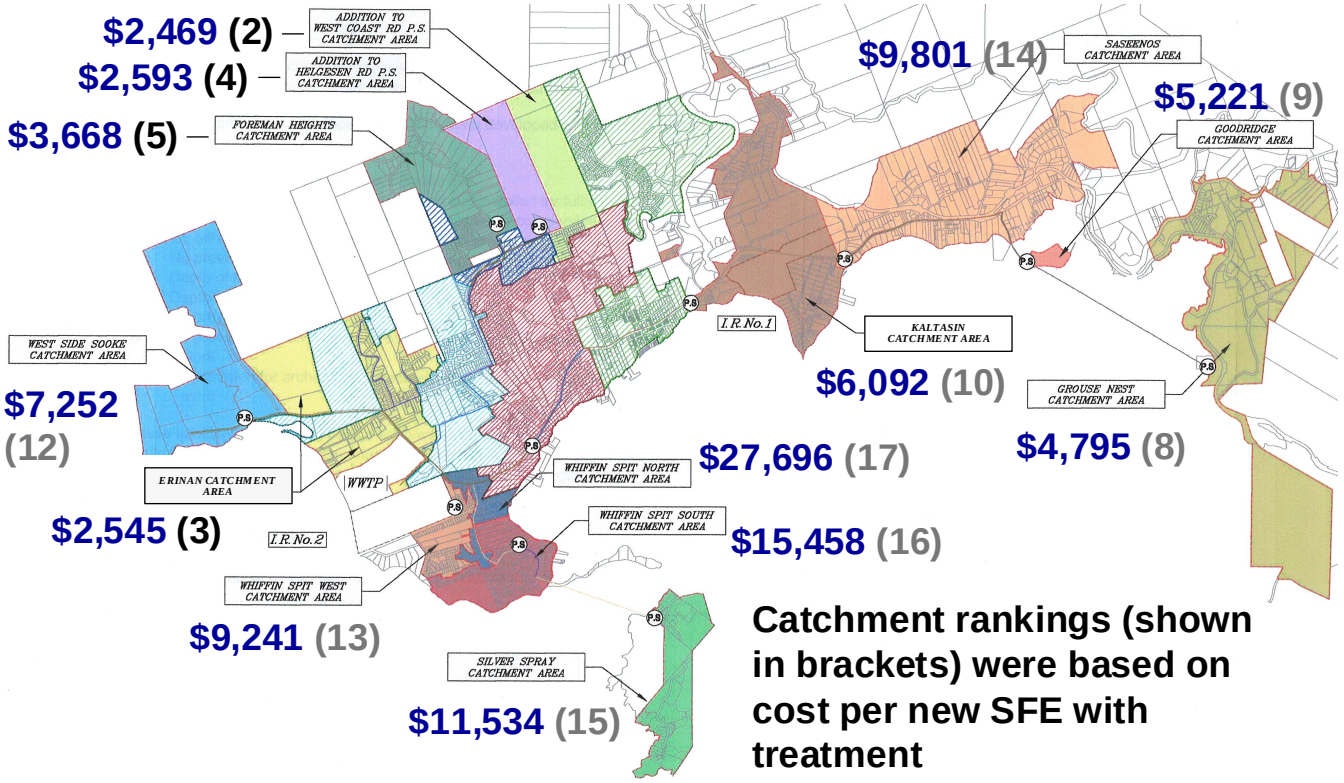
Beneficial Reuse Options for Biosolids

- The District's septic system and wastewater treatment plant biosolids are currently disposed to landfill
- Recommended options for biosolids management
  - Composting at existing facility (e.g. CVRD)
  - Land application for reforestation

Priority Catchment Areas for Sewering Outside the Core Area

- Scoring and ranking approach was developed using economics (cost) and environmental concern (surface water fecal coliform concentrations)

Economic Ranking Results



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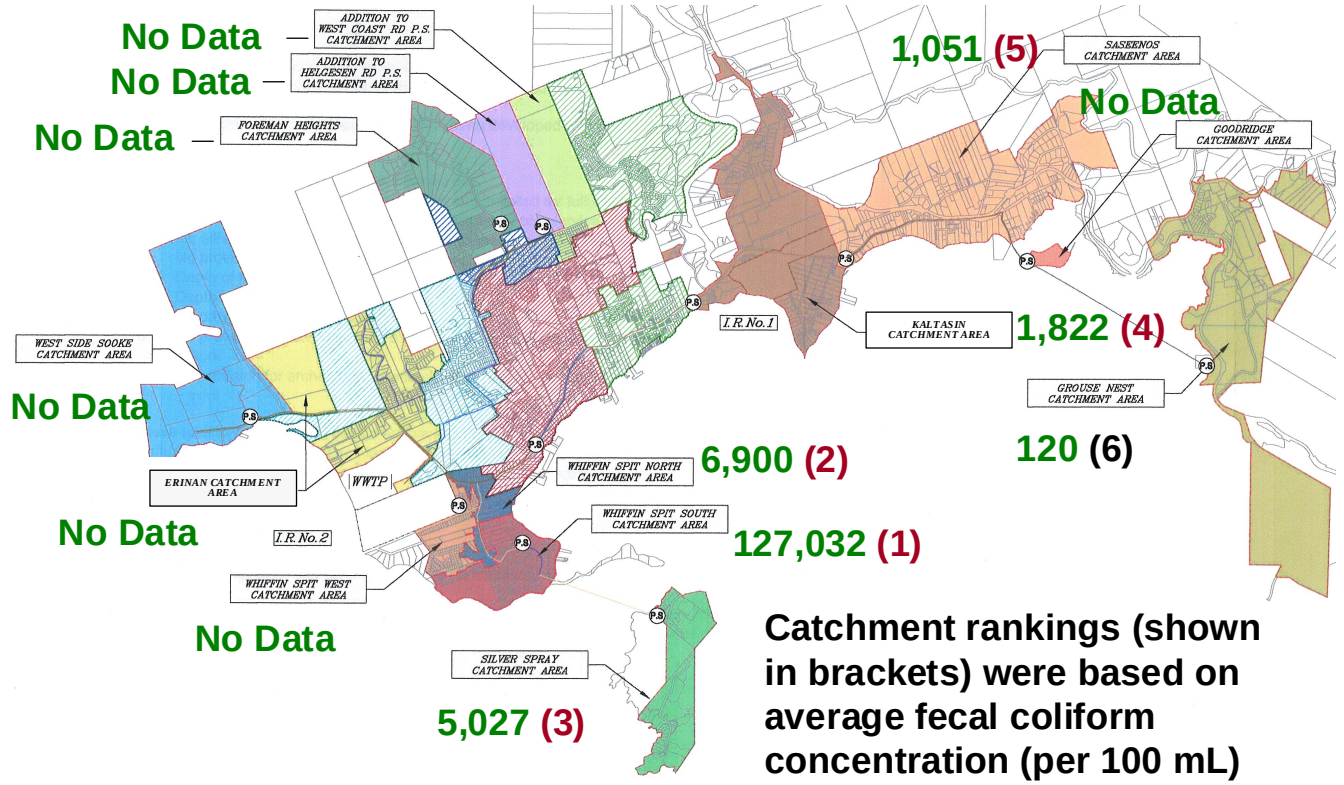

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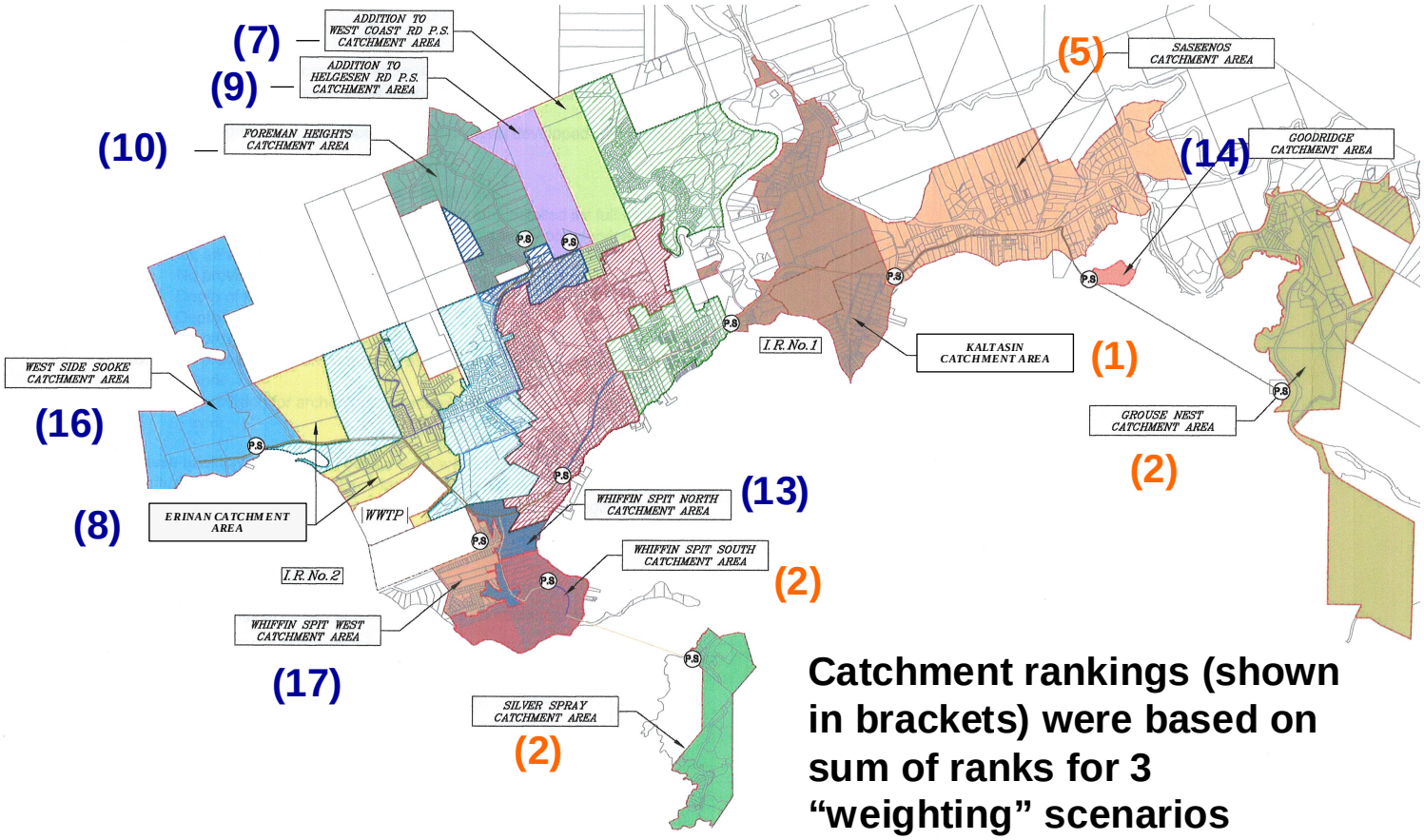
Overall Catchment Area Rankings



Catchment rankings (shown in brackets) were based on sum of ranks for 3 "weighting" scenarios

Results

- Based on the scoring and ranking approach, priority areas for sewering were identified as the following:
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  - Whiffin Spit South
  - Silver Spray
  - Grouse Nest
  - Saseenos

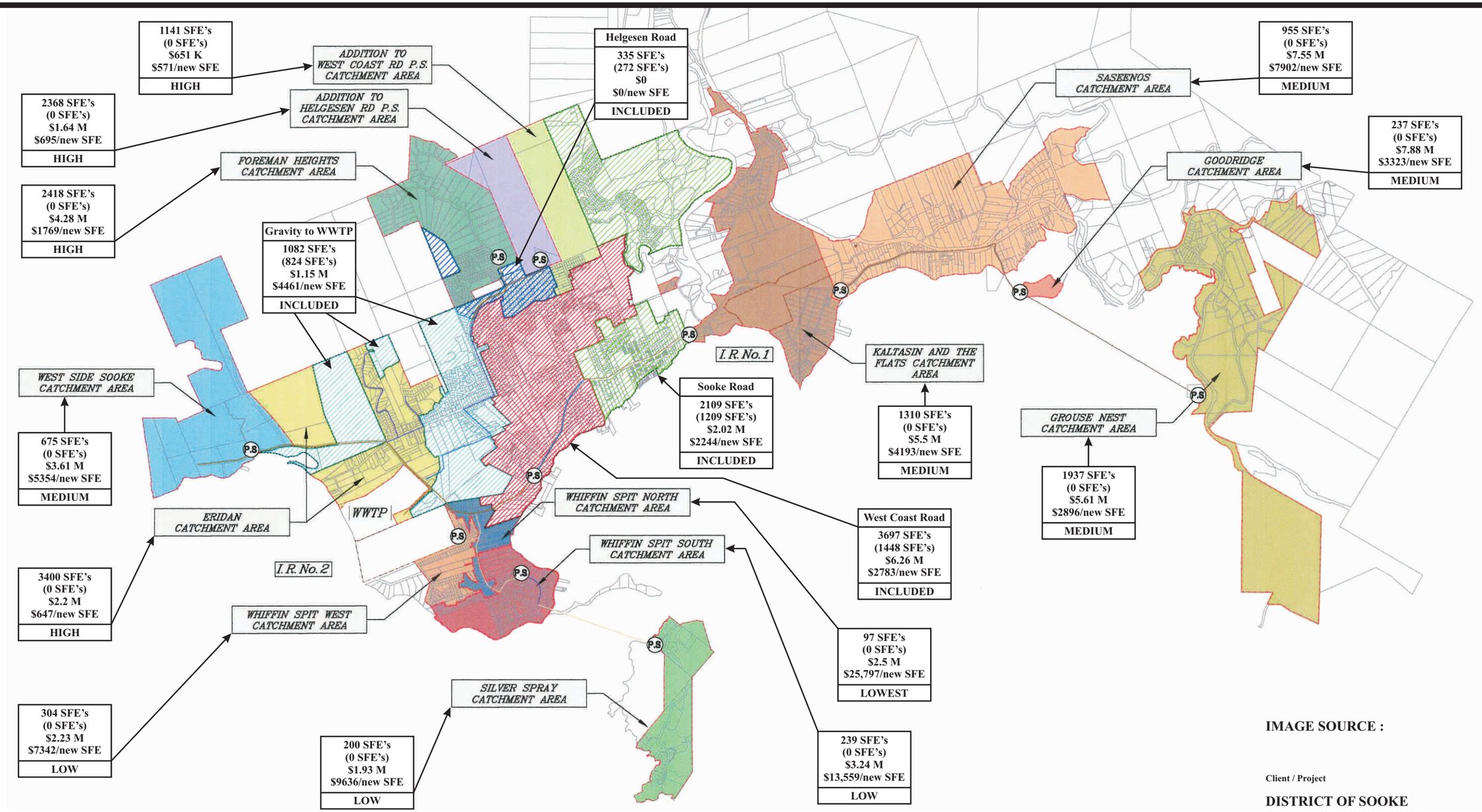

Figure 1
Cost Comparisons of Stantec's Option 4

LEGEND :

Number of new SFE's (Baseline SSA SFE's) Estimated Incremental Cost (without Treatment) Cost per new SFE
RATING for Inclusion in SSA

IMAGE SOURCE :

Client / Project

DISTRICT OF SOOKE
SOOKE SEWER MODEL
CONCEPTUAL DESIGN REPORT

Figure No.

4.5.3

Title

NEW CATCHMENT AREA LOCATIONS AND BOUNDARIES

STANTEC CONSULTING LTD.

Stage 3 LWMP Recommendations

- The District continue to provide secondary treatment of wastewater collected in the SSA
- The District develop a bylaw to prohibit direct effluent discharges to Sooke Harbour, Sooke Basin and their tributaries
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What is a Liquid Waste Management Plan (or "LWMP")?

A LWMP is a **three-stage** process that involves evaluation of the way wastewater (sewage) is managed in a community and development of a long-term plan for improved wastewater management that will help protect public health and the environment.

Why does Sooke need a LWMP?

The District of Sooke recently implemented a centralized wastewater collection and treatment system to service the "Core Area" plus some adjacent areas that have subscribed to the service. Outside these areas, homes, stratas and businesses are on their own waste disposal systems. These include septic tank systems and, in some cases, small "packaged" wastewater treatment plants. Some strata developments and some businesses have their own small treatment plants.

In most, if not all, cases, disposal of the effluent from these treatment systems is to ground. However, there is some evidence that bacteria associated with human waste are reaching Sooke Harbour and Sooke Basin. This is affecting the potential use of these waters and could directly and negatively impact human health.

As a result, the District needs a plan, in the form of a **LWMP**, to improve or eliminate this situation.

What are the three stages of a LWMP?

The District is currently undertaking **Stage 3** of its LWMP.

- **Stage 1** (completed between 1976 and 2002) involved studies investigating solutions to the District's wastewater management issues related to septic tank systems. This stage resulted in a $22 million project to sewer the Core Area and to provide secondary wastewater treatment.

- **Stage 2** (completed in 2005) evaluated questions related to wastewater management options for the District for the areas outside the Core Area.

- **Stage 3** (underway since June 2008) uses information developed in Stage 1 and Stage 2 to refine wastewater management options and costs and to develop an implementation plan for the LWMP.

Each of these stages typically involves review by a Technical Advisory Committee and a Public Advisory Committee followed by Public Information Meetings.

Recent LWMP-Related Activities

2006 - Sewering of the District's Core Area was completed

2007 - The District's Stage 2 LWMP was approved by the Ministry of Environment

2008 - The District's Stage 1 Rainwater Management Plan was approved by the Ministry of Environment

2008 - Conceptual design report for sewering areas outside the Core Area was completed by Stantec

2008 - The District began its Stage 3 LWMP and Stage 2 and Stage 3 Rainwater Management Plan

What studies have been completed as part of the Stage 3 LWMP process?

To date, seven discussion papers (DPs) and one summary report have been generated during Stage 3. Brief summaries of the DPs are provided below.

- **DP1 - Considerations for Adding New Sewered Areas to the District of Sooke Specified Sewer Area**

  - Ensure that existing users do not pay more than they already pay, while new users pay their fair share
  - Areas most economically feasible for expansion are the following:
    - Erinan Catchment
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    - Foreman Heights Catchment

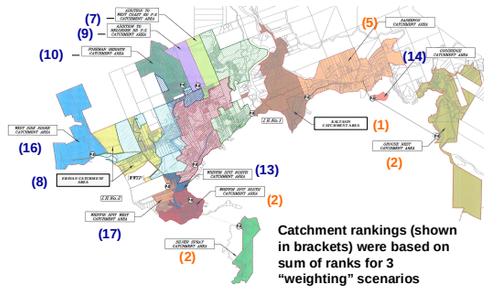
- **DP2 - Satellite Treatment Plant Effluent Standards**

  - Recommend use of reclaimed water quality standard
    - Add phosphorous removal
    - Possibly other advanced treatment prior to discharge
  - Recommend no direct discharge to Sooke Harbour, Sooke Basin or their tributaries

- **DP3 - Treatment Options for Areas Around Sooke Basin and Harbour**

  - Areas outside the Specified Sewer Area (SSA) currently use on-site treatment with ground disposal
  - Treatment options include the following:
    - On-site (septic systems)
    - Cluster treatment and discharge to ground or Sooke Bay
    - Connection to SSA sewer system (with additional treatment plant costs)
  - Onus on developer to evaluate treatment options for size and number of lots

- **DP4 - Rainwater Management Plan: Scope, Budget and Schedule**
  - Stage 2 and Stage 3 on-going in parallel with Stage 3 LWMP
  - To be completed in 2009
- **DP5 - On-Site Septic System Management Options**
  - Implement public education program for septic systems
  - Identify and monitor “hotspots” of environmental concern
  - Review success in eliminating “hotspots”
  - Implement formal management program (if needed) to ensure septic tanks are regularly pumped out and inspected
- **DP6 - Investigation of Beneficial Reuse of Septage and Treatment Plant Biosolids**
  - The District’s septic system and wastewater treatment plant biosolids are currently disposed to landfill
  - Recommended options for biosolids management include the following:
    - Composting at an existing facility (e.g. Fisher Road Recycling in CVRD)
    - Land application for reforestation
- **DP7 - Priority Assessment for Sewering Catchment Areas in the District of Sooke**
  - Scoring and ranking approach was developed using economics (cost) and environmental concerns (surface water fecal coliform concentrations)



Catchment rankings (shown in brackets) were based on sum of ranks for 3 “weighting” scenarios

- Based on the approach used, priority areas for sewering were identified as Kaltasin, Whiffin Spit South, Silver Spray, Grouse Nest, and Saseenos

Stage 3 LWMP Recommendations

- The District continue to provide secondary treatment of the wastewater collected in the SSA
- The District develop a bylaw to prohibit direct effluent discharges to Sooke Harbour, Sooke Basin and their tributaries
- The District develop a bylaw that requires multi-season soil percolation tests prior to design and installation of on-site treatment systems
- The District ban connection of roof and foundation drains to the sanitary sewer system to ensure capacity of the sewer system is maintained
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Do you have further questions about the District’s LWMP?

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Senior Environmental Engineer

Phone: 604.293.1411
Email: forgied@ae.ca

Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

District of Sooke

Stage 3 Liquid Waste Management Plan

Public Open House

Summary Brochure

District of Sooke

SEAPARC Centre

Wednesday May 6, 2009

TOWN HALL MEETING
Monday, November 30, 2009
SOOKE COMMUNITY HALL
4:00 pm to 8:00 pm

The District of Sooke TOWN HALL MEETING will be held on Monday, November 30th, 2009 at the Sooke Community Hall. Sooke residents will have an opportunity to hear presentations and talk to Council and Staff on current municipal projects and initiatives:

Official Community Plan
Strategic Plan – Top "15"
2010 Five Year Financial Plan
Liquid Waste Management Plans
Park Acquisition and Disposal
AND MUCH MORE!

Everyone is welcome to drop in to this informal Town Hall Meeting – further information will be available on our website www.sooke.ca and at the municipal hall.

Date: Monday, November 30, 2009
Time: 4:00 pm to 8:00 pm
Place: Sooke Community Hall
Eustace/Shields Road
Contact: District of Sooke
Tel: 642-1634 Fax: 642-0541
Website: www.sooke.ca
Email: info@sooke.ca

Council is asking the public for comments and suggestions; members of the public may also make submissions by email, fax, or in writing to the Municipal Hall.

District of Sooke
Stage 3 Liquid Waste Management Plan
Background

- Liquid Waste Management Plans (LWMPs) are a three-stage process
  - **Stage 1** (completed 1976 - 2002) involved studies investigating solutions to the District's wastewater management issues related to septic tank systems. This stage resulted in a $22 million project to sewer the Core Area and to provide secondary wastewater treatment.
  - **Stage 2** (completed in 2005) evaluated questions related to wastewater management options for the District for the areas outside the Core Area.
  - **Stage 3** (underway since June 2008) uses information developed in Stage 1 and Stage 2 to refine wastewater management options and costs and to develop an implementation plan for the LWMP.
- In 2006, sewering of the District of Sooke's Core Area was completed
- In 2007, the District's Stage 2 LWMP was approved by the Ministry of Environment (MoE)
  - Stage 3 LWMP tasks were based on recommendations made by MoE upon approval of Stage 2 LWMP
- In May 2008, the conceptual design report for sewering areas outside the Core Area was completed by Stantec

Findings of Stage 2 LWMP

- Very few areas have optimal conditions for on-site septic tank disposal systems
- Areas with low likelihood of suitable soils for on-site treatment should have a minimum lot size of 1 ha (2.47 acres)
- Housing lots for other areas should require additional land for a second septic tank disposal field
- Minimum recommended lot size of 2200 to 2600 m^2 (for excellent soil conditions)
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- Procedures should be developed to deal with subdivisions that are favourable for connection to Core Area sewer system

Stage 3 LWMP Studies

Considerations for Adding New Sewered Areas

- Ensure that existing users do not pay more than they already pay, while new users pay their fair share
- Area most economically feasible for expansion is Foreman Heights Catchment
- Areas with medium economic feasibility include the following:
  - Erinan
  - Whiffin Spit North
  - Four catchments to the east – Kaltasin, Saseenos, Goodridge and Grouse Nest (taken as a whole or phased in)

Satellite Treatment Plant Effluent Standards

- Recommend use of reclaimed water quality standard
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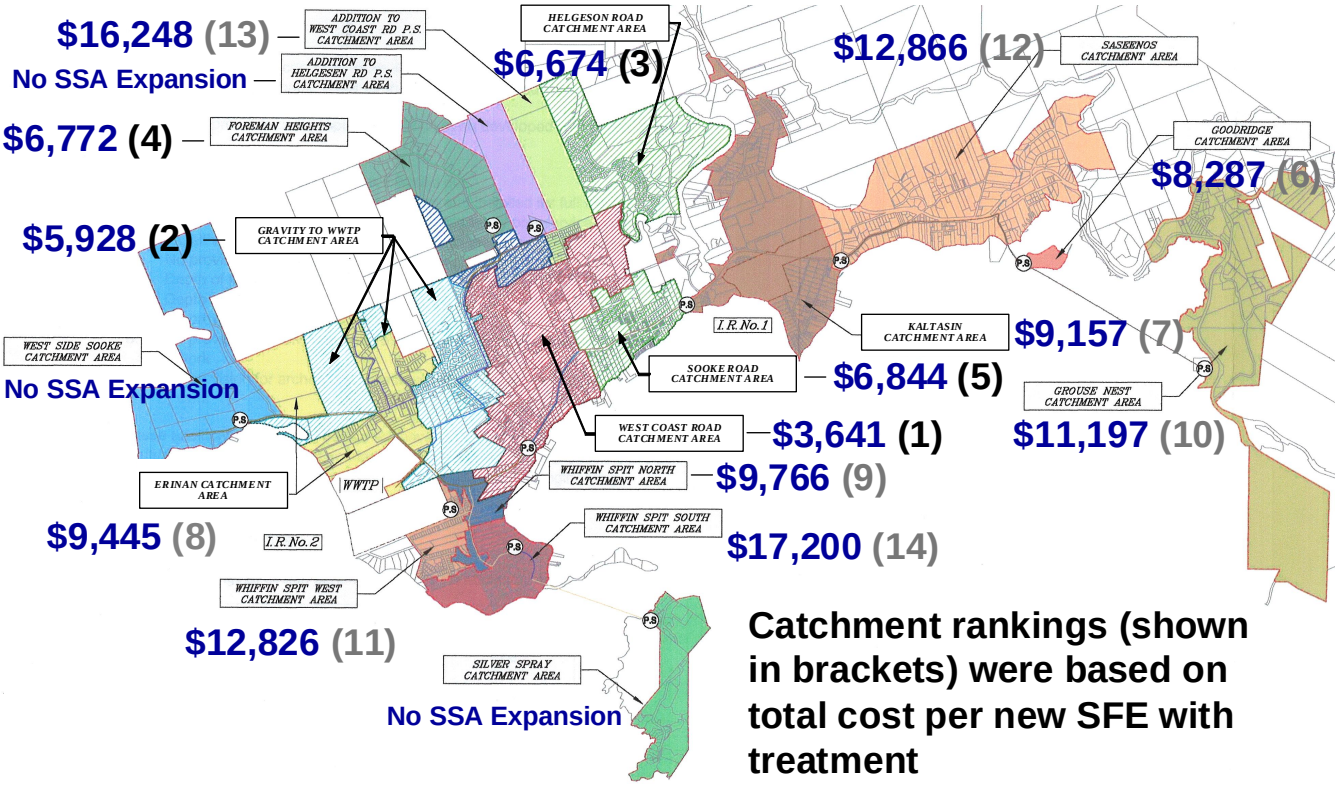

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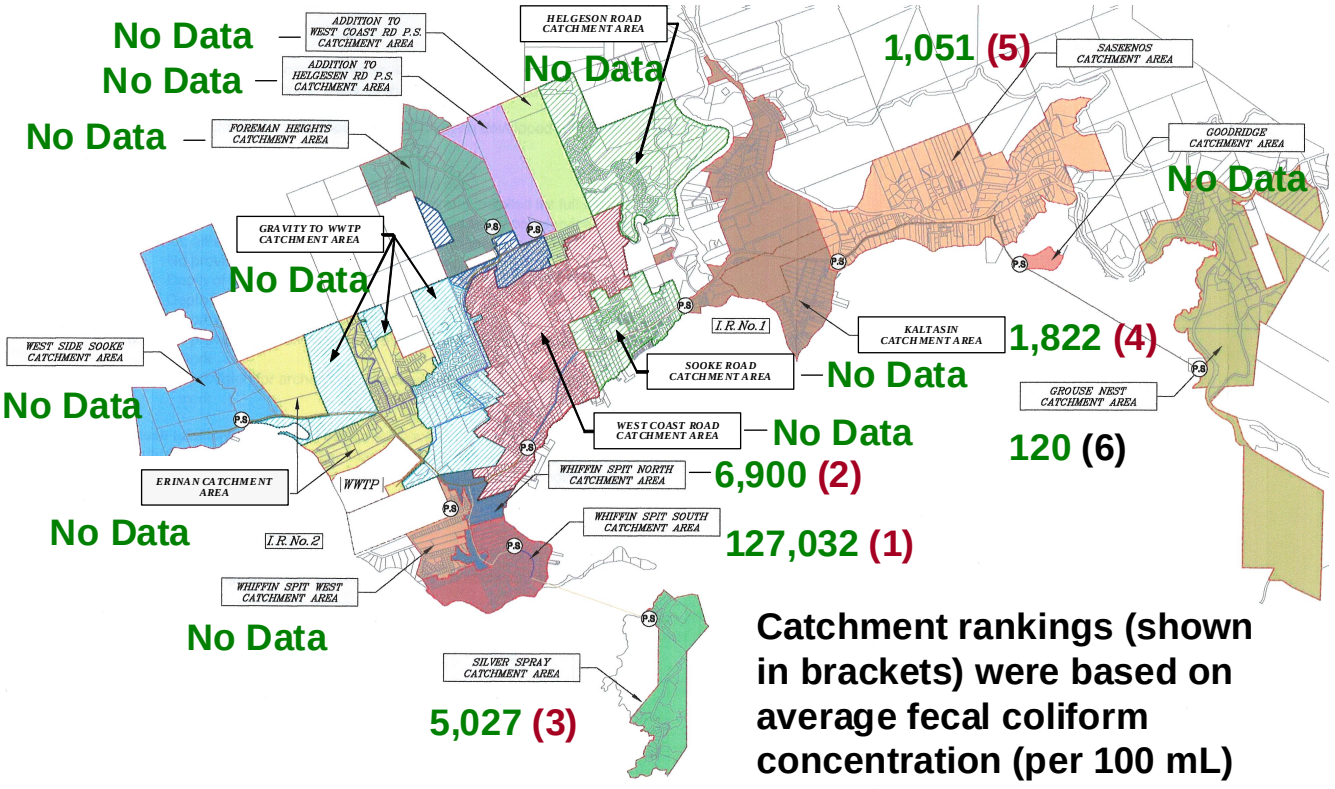

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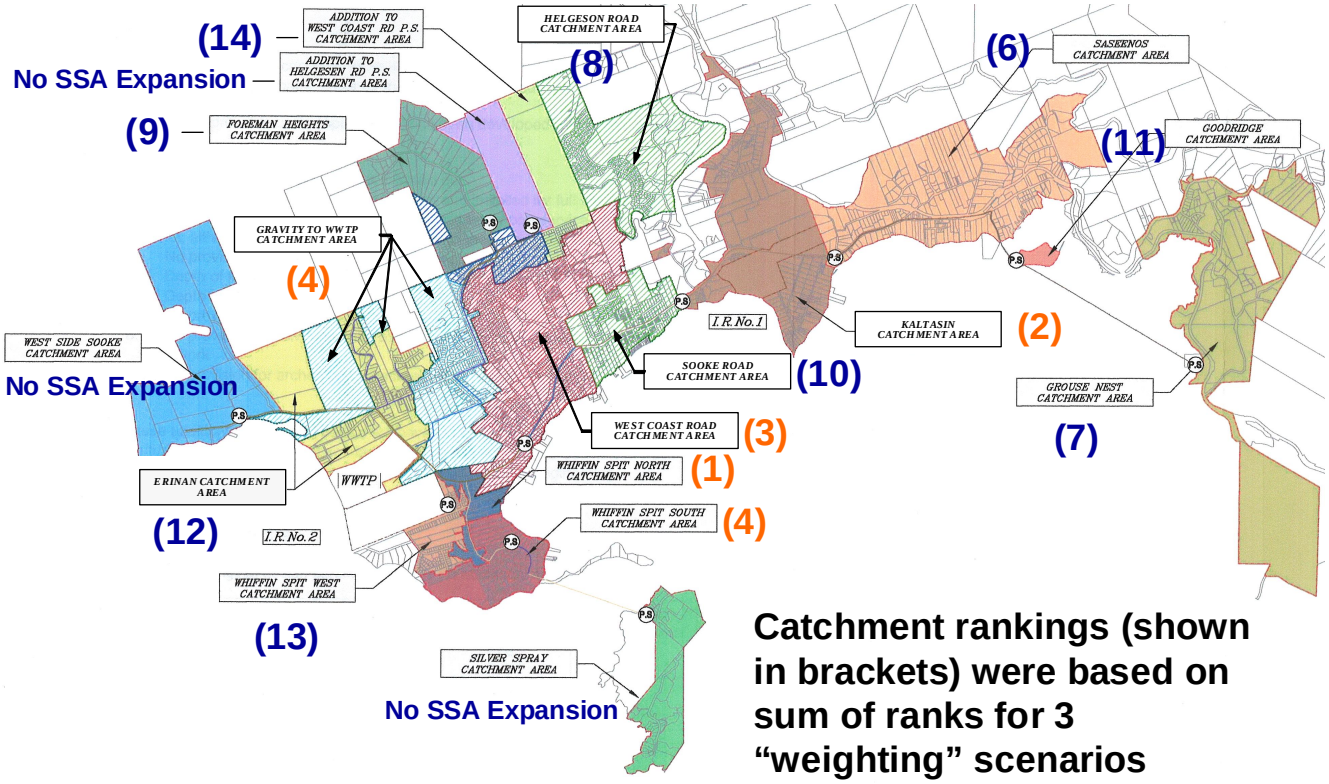

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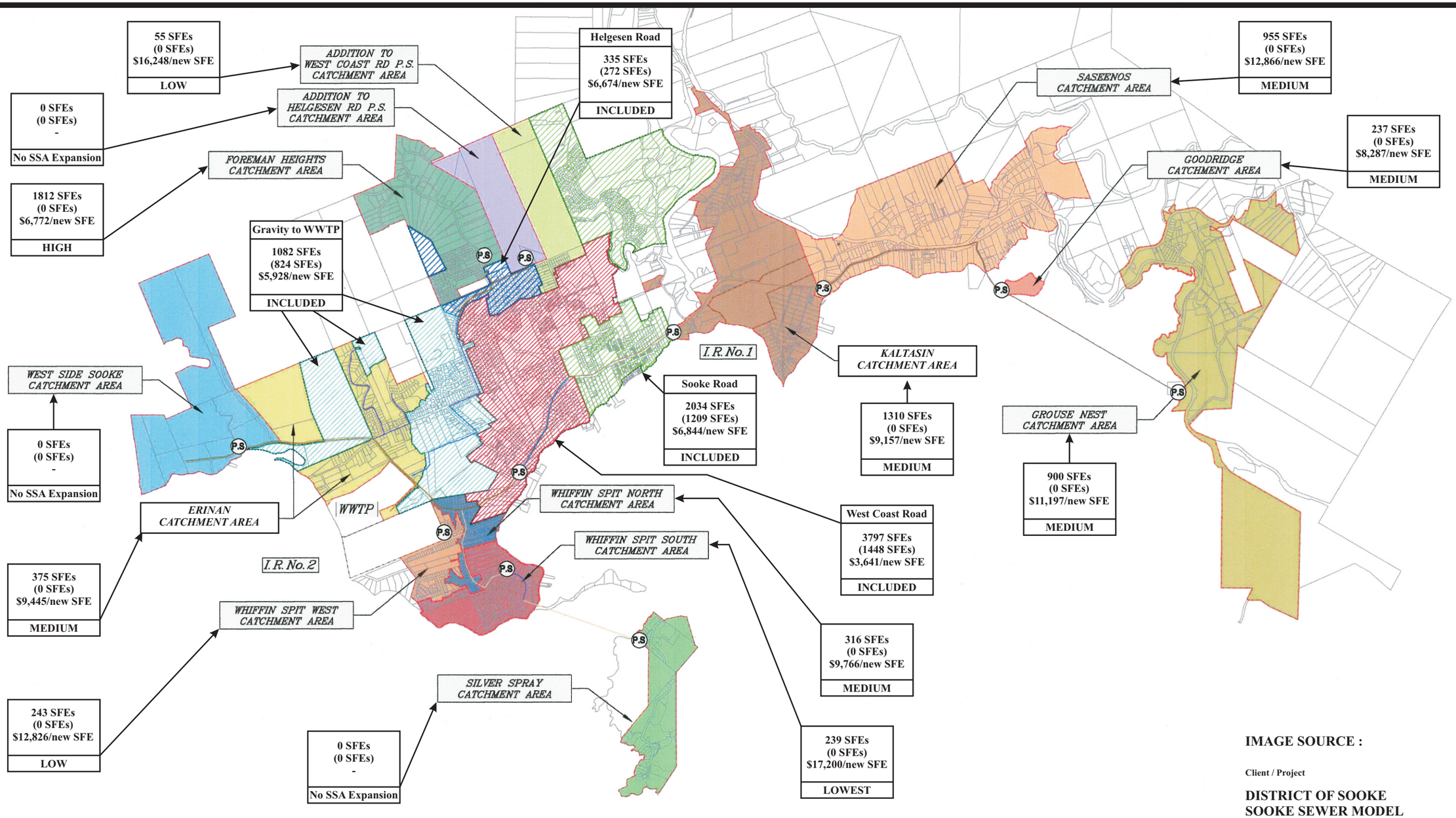

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IMAGE SOURCE :

Client / Project

DISTRICT OF SOOKE
SOOKE SEWER MODEL
CONCEPTUAL DESIGN REPORT

Figure No.

4.5.3

Title

NEW CATCHMENT AREA LOCATIONS AND BOUNDARIES

STANTEC CONSULTING LTD.

p:\022374\01\Civil\Figure_1

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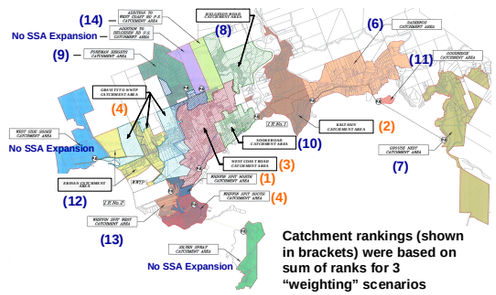

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Stage 3 LWMP Recommendations

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District of Sooke

Stage 3 Liquid Waste Management Plan

Public Open House

Summary Brochure

District of Sooke

Town Hall

Monday November 30, 2009

L Appendix L - Draft Operational Certificate

DISTRICT OF SOOKE WASTEWATER TREATMENT PLANT

OPERATIONAL CERTIFICATE

February, 2009
LIQUID WASTE MANAGEMENT PLAN
DRAFT OPERATIONAL CERTIFICATE
DISTRICT OF SOOKE
WASTEWATER TREATMENT PLANT

PREAMBLE

This preamble presents the rationale for establishment of the major elements of the Operational Certificate (OC) for the District of Sooke Wastewater Treatment Plant (DSWWTP). It is provided for information only and is not intended to be part of the OC. The OC will supersede the existing Municipal Sewage Regulation (MSR) registration.

Service Area

The DSWWTP was developed and implemented as part of an overall design, build and operate (DBO) program that provided sewers and sewage collection to a Core Area within the District of Sooke.. The DSWWTP was originally intended to treat to domestic wastewater generated within a specified sewer area (SSA), consistent with Bylaw No. *224*, of *2005*.

The facility was designed and constructed by EPCOR as part of a DBO contract with the District of Sooke. EPCOR continues to operate the facility and, under the current contract, will do so until at least *2009*. In future, there could be a difference firm that is contracted to operate the wastewater collection and treatment systems.

Future DSWWTP expansion will largely depend on the expansion of the sewage collection system which will most likely be developer-driven rather than District of Sooke driven.

Maximum Daily Flow

The draft OC specifies the maximum authorized rates of discharge for the plant. These values are equivalent to the maximum daily flow, and indicates the maximum effluent volume discharged from the plant over a 24-hour period. An annual average daily flow, based on an average annual averaging period, is not included in the draft OC.

This approach is consistent with the current *Municipal Sewage Regulation* that specifies maximum criteria, which are not to be exceeded, for authorized discharges.

Standby Power

During a power failure, the DSWTTP continues to provide hydraulic conveyance of wastewater through the plant, while providing primary treatment through the process tankage, without the need for standby power. That said, the plant currently has full standby power capacity via a diesel-powered generation set.

Odour Control

The District places a high priority on odour control and management, applying a pro-active approach that enables response to situations before problem development. In response to potential problems, the District will take measures to reduce odours to acceptable levels, as required.

Biosolids Management

The operation of the treatment plant produces screenings and sludge that require management off-site. The District has begun development of a Residuals Management Plan. The plan will emphasize the Ministry of Environment's policy of beneficial reuse of residuals where practical. As the plan will extend beyond the bounds of the Operational Certificate for the DSWWTP, approval of the residuals management program by the Regional Waste Manager will be dealt with separately from the Operational Certificate.

MINISTRY OF ENVIRONMENT

OPERATIONAL CERTIFICATE

ME-_____

Under the Provisions of the Environmental Management Act

District of Sooke

2205 Otter Point Road

Sooke, B.C.

V0S 1N0

is authorized to discharge effluent from a municipal wastewater collection and treatment system located at West Coast Road in the District of Sooke, to Sooke Bay, subject to the conditions listed below. Contravention of any of these conditions is a violation of the Environmental Management Act and may result in prosecution.

This operational certificate supersedes all previous versions of registration No. RE-17300, issued under Part 2 Section 3 of the Municipal Sewage Regulation, pursuant to the Environmental Management Act.

1. AUTHORIZED DISCHARGES

This subsection applies to the discharge of effluent from the District of Sooke wastewater treatment plant, a **MUNICIPAL WASTEWATER TREATMENT PLANT** serving a portion of the District of Sooke. The site reference number for this discharge is E 250429.

1.1 The maximum authorized rate of discharge is 6900 m^3/d.

1.2 The average annual flow is 3000 m^3/d.

1.3 The characteristics of the discharge to Sooke Bay shall not exceed:

5-day biochemical Oxygen Demand	45 mg/L
Total Suspended Solids	45 mg/L

Date Issued:

_____

Date Amended:
(most recent)

Randy Alexander, P.Eng.
Regional Environmental Protection Manager

pH	6-9 pH units
Fecal Coliform Bacteria (Geometric Mean)	200 colonies/100 mL

The characteristics shall be measured based on the sampling procedures and frequencies stipulated under Subsection 3.1.

The geometric mean for the fecal coliform test, shall be determined from the bacteriological results of the last 5 samples for which analyses have been completed over the last 30 days, and means the anti-logarithm of a calculation in which the logarithms of a series of numerical measures are summed and divided by the number of numerical measures).

1.3 The authorization works are mechanical screens, sequencing batch reactor secondary treatment, ultra violet disinfection, aerated sludge holding tank, biosolids trucking off-site for treatment and reuse, an outfall extending *1750* m from mean low water to a depth of *30* m below mean low water, and related appurtenances approximately located as shown on attached site plan (Appendix A).

1.4 The authorized works must be complete and in operation from the date of this operational certificate.

1.5 The location of the facilities from which the effluent originates is legally described as, *Part of That Part of Lot 8, Plan VIP 77455, Sections 1,2 and 3, Sooke District, Plan 2318, lying to the South West of the West Coast Road as Said Road is shown on Plan 1423 O/S Except Part in Plan 5361*. As shown on the attached site plant (Appendix A).

1.6 The location of the point of discharge is in Sooke Bay, as approximately shown on the attached site plan (Appendix A).

2. GENERAL REQUIREMENTS

2.1 Maintenance of Works and Emergency Procedures

The District of Sooke, or its contracted agent, shall inspect the pollution control works regularly and maintain them in good working order. In the event of an emergency or condition beyond the control of the District of Sooke, which prevents continuing operation of the approved method of pollution control, the District of Sooke shall immediately notify the Regional Waste Manager and take appropriate remedial action.

2.2 Emergency Procedures

In the event of an emergency which prevents compliance with a requirement of the operational certificate, that requirement will be suspended **for such time as the emergency exists** or until otherwise directed by the Regional Waste Manager provided that:

a. Due diligence was exercised in relation to the process, operation or event which caused the emergency and that the emergency occurred notwithstanding this exercise of due diligence;

b. The Regional Waste Manager is immediately notified of the emergency; and

c. The emergency condition is being corrected with due diligence.

2.3 Process Modifications

The District of Sooke shall notify the Regional Waste Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge.

2.4 In-plant effluent reuse

The District of Sooke or its authorized operator will minimize potable water use at the treatment plant by reusing secondary effluent for plant washdown water. Such water use will be based on chlorinated secondary effluent from a separate storage tank, conveyed to points of use through a completely separated and labelled dedicated pump-pressurized water distribution system. This system will be in compliance with the applicable BC plumbing codes and levels of effluent chlorination will be in compliance with applicable Ministry of Health and Workers Compensation Board requirements. Use of chlorinated effluent will not be allowed outside of the immediate treatment plant and will not be used for plant site irrigation.

2.5 Posting of Outfall

The District of Sooke shall erect a sign along the alignment of the outfall above high water mark. The sign shall identify the nature of the works. The wording and size of the sign requires approval of the Regional Waste Manager.

2.6 Outfall Inspection

The District of Sooke shall conduct an inspection of the outfall every five years, or as may otherwise be required by the Regional Waste Manager.

2.7 Odour Control

Should objectionable odours, attributable to the operation of the sewage treatment plant occur beyond the property boundary, as determined by the Regional Waste Manager, measures or additional works will be required to reduce odours to acceptable levels.

2.8 Biosolids Management

Biosolids wasted from the treatment plant shall be treated and/or reused as approved under the District of Sooke's Residuals Management Program.

2.9 Facility Classification and Operation Certification

The District of Sooke shall have the works authorized by this operation certificate classified (and the classification shall be maintained) by the Environmental Operators Certification Program Society (Society). The works shall be operated and maintained by persons certified within and according to the program provided by the Society. Certification must be completed to the satisfaction of the Regional Waste Manager. In addition, the Regional Waste Manager shall be notified by the classification level of the facility and certification level of the operators, and changes of operators and/or operator certification levels within 30 days of any change.

Alternatively, the works authorized by the operational certificate shall be operated and maintained by persons who the District of Sooke can demonstrate to the satisfaction of the Director, are qualified in the safe and proper operation of the facility for the protection of the environment.

3 MONITORING AND REPORTING REQUIREMENTS

3.1 Discharge Monitoring

3.1.1 Effluent Sampling and Analyses

The District of Sooke shall install a suitable sampling facility and obtain samples of the effluent in accordance with the following schedule:

Parameter	Frequency	Type
5-day Biochemical Oxygen Demand	monthly	grab
Total Suspended Solids	monthly	grab
pH	monthly	grab
Fecal Coliform	5 times in each 30 days	grab
Toxity Testing	Not required	N/A

Proper care shall be taken in sampling, storing and transporting the samples to adequately control temperature and avoid contamination, breakage, etc.

Effluent toxicity testing is not required based on the Municipal Sewage Regulation Part 4 Section 9 subsection (2), clauses (d) and (e) wherein the discharge is to open marine waters and the dilution at the edge of the initial dilution zone (IDZ) is greater than 100:1.

3.1.2 Flow Measurement

Provide and maintain a suitable flow measuring device and record two times per week the effluent volume discharged over a 24-hour period.

3.2 Receiving Environment Monitoring

A receiving environment monitoring program shall be carried out by the District of Sooke. The program shall be established in consultation with the Regional Waste Manager. Based on the results of this monitoring program, the District of Sooke's monitoring requirements may be extended or altered by the Regional Waste Manager.

Under the MSR registration, the receiving environment monitoring has been conducted twice per year. However, based on three years of data showing fairly consistent water quality results, it is proposed that the frequency of monitoring is reduced to once per year.

3.3 Monitoring Procedures

3.3.1 Sampling and Flow Measurements

Sampling shall be carried out in accordance with the procedures described in the British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials (March 1994

Permittee Edition), or by suitable alternative procedures as authorized by the Regional Waste Manager.

Flow Measurement shall be carried out in accordance with the procedures described in "British Columbia Field Sampling Manual for Continuous Monitoring Plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment and Biological Samples", November 1996, or by suitable alternative procedures as authorized by the Regional Waste Manager.

Copies of the above manual may be obtained from the Pollution Prevention Program, Ministry of Water, Land and Air Protection, P.O. Box 9342, Stn Prov Gov, Victoria, British Columbia V8W 9M1. The manual is also available for review at all Pollution Prevention Program Offices.

3.3.2 Chemical Analyses

Analyses are to be carried out in accordance with procedures described in the latest version of BRITISH COLUMBIA ENVIRONMENTAL LABORATORY MANUAL for the Analysis of Water, Wastewater, Sediment and Biological Materials (March 1994 Permittee Edition), or by suitable alternative procedures as authorized by the Regional Waste Manager.

A copy of the above manual may be purchased from the Queens Printer Publications Centre, 2nd Floor, 563 Superior Street, Victoria, British Columbia, V8V 4R6 (1-800-663-6105). A copy of the manual is also available for review at any Pollution Prevention Program Office.

3.4 Reporting

Maintain data of analyses and flow measurements for inspection and submit the data, suitably tabulated, to the Regional Waste Manager for the previous quarter. With prior written authorization from the Regional Waste Manager, data may be submitted, suitably formatted on a computer storage media such as a floppy disk, or with prior arrangement, be electronically transmitted directly to the Ministry of Environment, Lands and Parks central computer system. Such data shall be transmitted quarterly with an annual report completed once per year.

Receiving environment monitoring results and reports shall be submitted to the Regional Waste Manager within 60 days of the end of the calendar years and shall be made available by the District of Sooke to the public on request.