SUNSHINE COAST REGIONAL DISTRICT

HALFMOON BAY
LIQUID WASTE MANAGEMENT PLAN

Adopted by Board Policy

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CONTENTS

1.0 STATEMENT OF PLAN OBJECTIVE AND GUIDING PRINCIPLES

2.0 PLAN DEVELOPMENT PROCESS

- 2.1 Ministry Guidelines
- 2.2 Stage 1 and Stage 2
- 2.3 Public Consultation

3.0 LIQUID WASTE MANAGEMENT PLAN

- 3.1 Source Control Program
- 3.2 Volume Reduction Program
- 3.3 Surface Water Management Program
- 3.4 Liquid Waste Management
  - 3.4.1 Option 1 Details
  - 3.4.2 Septic System Costs
  - 3.4.3 On-Site Operation and Maintenance
  - 3.4.4 Overview of On-Site System Management
  - 3.4.5 Coast Garibaldi Health Responsibilities
  - 3.4.6 SCRD Responsibilities
  - 3.4.7 Homeowners' Responsibilities
  - 3.4.8 Homeowners' Fees for On-Site O&M Program
  - 3.4.9 Upgrade Existing Community Treatment Facilities
  - 3.4.10 Other Private Systems
  - 3.4.11 Direct Discharge
  - 3.4.12 Boat Holding Tank Pump Out Facility
  - 3.4.13 Existing and Future On-Site Problem Areas

4.0 IMPLEMENTATION SCHEDULE, COSTS, FINANCING

- 4.1 Implementation Schedule and Costs
- 4.2 Proposed Financing

5.0 APPROVAL, MONITORING AND AMENDMENTS

- 5.1 Board Approval of Plan
- 5.2 Monitoring and Reporting
- 5.3 Amendment Process

Schedule A Current Problematic Areas

Schedule B August 11, 2002 Open House Questionnaire Results

Schedule C Replacement Costs for Individual Owners of On-Site Systems

Schedule	D	Proposed On-Site Systems Co-Management Scenario
Schedule	E	Annual Recovery Costs on Capital Investment for Publicly Owned Community Treatment Facilities
Schedule	F	Existing Pollution Control Permits within the Plan Area
Schedule	G	Cost Estimates for Secret Cove Pump Out Facility
Schedule	H	Implementation Schedules, Program and Project Cost Estimates, Financing and Cost Recovery
Schedule	I	Subdivision Servicing Standards: Sewage Disposal

1.0 STATEMENT OF OBJECTIVE AND GUIDING PRINCIPLES

The objective of the Halfmoon Bay Liquid Waste Management Plan (LWMP) is the establishment of a region-wide long range (20 years and beyond) strategy that will provide a comprehensive approach to managing liquid waste reduction, treatment, utilization and disposal.

The goals of the LWMP include the following:

a) Protection of water, land and air from liquid waste pollution.
b) Reasonable cost and impact on the people.
c) Flexibility to cost effectively accommodate changes – both technical and political.

Guiding principles used to develop the Plan include the following:

1. The LWMP policies are not to exceed the capacity of the environment to assimilate waste, and to ensure protection of human health, with the strategies for achieving these goals being in accordance with the precautionary principle.

2. The Halfmoon Bay liquid waste stream is reduced to the greatest extent possible, in accordance with the hierarchy of reduce, reuse, and recycle, while considering local resources and the nature of the Region's liquid waste stream.

3. Individuals, institutions and companies are enabled to make environmentally sound choices about consumption of resources and generation of liquid waste through provision of appropriate information and assistance with the development of appropriate codes of practices, policies and procedures. User-pay principles and market-based incentives will be used wherever possible to encourage participation.

4. Liquid waste policies and strategies are developed through an open and effective public consultation process in a cooperative manner between government, private enterprise and community stakeholders.

5. Existing sewage treatment facilities with ocean outfalls are operated to minimize adverse impact on neighbouring development through provision of facility upgrades as technology improves.

6. The evaluation of liquid waste management alternatives takes into account technical, environmental and social factors as well as life cycle cost in order to provide decision makers with a balanced perspective on the alternatives for consideration.

7. The overall program is flexible and can be modified to meet changing conditions such as future demands, new environmental criteria and evolving technologies.

8. The LWMP is to be consistent with the goals, objectives and policies of the Halfmoon Bay Official Community Plan (OCP) and its amendments. The LWMP

specifically recognizes and supports the OCP goals of containing future cluster development, multi-family dwelling units, protection of rural integrity including the Agricultural Land Reserve, efficient use of services and resources, and cooperation amongst jurisdictions.

9. Shellfish harvesting water quality shall be the target for ocean water quality in the Plan Area. *(Shellfish closures are normally initiated when the median fecal coliforms for a minimum of 15 samples exceeds 14 most probable number (MPN) per 100 mL, or if at least 10% of the samples exceed 43 MPN/100mL)*

10. The preferred method of liquid waste disposal shall be on-site disposal or small community systems utilizing land disposal.

11. Additional ocean outfalls within the Halfmoon Bay Plan Area shall be prohibited.

12. Where required, existing (August 2005) facilities utilizing ocean disposal may serve existing areas experiencing liquid waste disposal problems.

2.0 PLAN DEVELOPMENT PROCESS

The LWMP has been developed in three stages. consistent with the process outlined in the Ministry of Water, Land and Air Protection (MWLAP) Guidelines for Developing a Liquid Waste Management Plan (the guidelines). The guidelines are summarized below in section 2.1. An overview of the Stage 1 and Stage 2 reports is provided in section 2.2 and the public consultation process is described in section 2.3.

2.1 Plan Process

The guidelines for developing a LWMP produced by BC Environment (1992) were used in developing this plan. The guidelines recommend a three-stage process, each involving meaningful public consultation. Stage 1 identifies existing conditions, projects development and considers a range of treatment, reuse and disposal options. Those treatment, reuse and disposal options that have merit are advanced into Stage 2 for more detailed evaluation. Finally, the selected option is described and costed, the implementation schedule is developed and draft operational certificates are prepared in Stage 3.

Normally the Stage 3 Plan is approved by the Minister of Water, Land and Air Protection. However, in this case the Regional District will be implementing this plan without the approval of the Minister as per SCRD OCP policy (see 5.1). To ensure broad representation and technical input the following agencies participated in the development of this LWMP:

- Ministry of Health/Vancouver Coastal Health Authority
- District of Sechelt
- Ministry of Community, Aboriginal and Women's Services
- Ministry of Water, Land and Air Protection
- Ministry of Transportation
- Sechelt Indian Government District
- Environment Canada
- Ministry of Forests

2.2 Stage 1 and Stage 2

Dayton & Knight Ltd. was retained by the Regional District to provide technical support to the advisory committee for Stage 1 and Stage 2. Stage 1 was completed on February 20, 1992. The Stage 1 report was drafted for a larger geographic area spanning from Secret Cove to Wilson Creek. Some of the Stage 1 (1992) findings and recommendations have been modified or deleted in the Stage 2 work to reflect the issues of specific concern to Halfmoon Bay and to reflect more up-to-date information. Additional information was included in the Stage 2 report to address new requirements of the Ministry of Water, Land and Air

Protection; specifically, source control, volume reduction, and drainage management options.

In May 1995, the Sechelt Sewage Facilities Commission passed a resolution to split the Secret Cove to Wilson Creek Wastewater Management Plan Stage 2 into two portions: the District of Sechelt and the Sechelt Indian Government District forming its own LWMP and the SCRD developing a Stage 2 LWMP for the Halfmoon Bay Area. The Ministry of Water, Land and Air Protection approved the revised terms of reference for a completion of the Halfmoon Bay LWMP Stage 2 in November 1995.

2.3 Public Consultation Process

Public consultation is an essential element in the LWMP process. The importance of providing opportunities for public information and input into the LWMP is stressed in the former *Waste Management Act* (now the *Environmental Management Act*), requiring the Ministry of Water, Land and Air Protection to be satisfied that there has been adequate public review and consultation prior to approving the Plan.

The overall goal of the LWMP public consultation program was to foster support and acceptance for the Plan through meaningful public participation. The combined public/technical Liquid Waste Advisory Committee (LWAC) played a key role in this process. The LWAC's community, environmental and business representatives had direct input into development of the LWMP and the Plan's public consultation program.

A public open house was held at Coopers Green Hall on September 19, 1998. The Open House provided the public with an overview of the background materials relating to a LWMP including existing waste management practices, growth projections, and provincial ministry regulations and requirements.
Invitation to the Stage 2 Open Houses was mailed to each mailbox in the Plan Area. A second Open House was held August 11, 2002 to review the draft Stage 2 Report. A third Open House was held August 25, 2002 to review changes to Stage 2 and to invite comments on Stage 3.

3.0 LIQUID WASTE MANAGEMENT PLAN

This section presents actions that will be taken by the Regional District to implement the Halfmoon Bay LWMP.

3.1 Source Control Program

The purpose of source control is to prevent the discharge of wastes, both toxic and non-toxic, into individual septic tank/tile fields and into community sanitary sewer systems which may degrade the quality of receiving waters or hinder the efficiency of wastewater treatment systems. Source control programs must be directed at both domestic and non-domestic users. Outdoor activities including the use of pesticides and herbicides must also be targeted for their potential to impact stream water quality and groundwater recharge.

Education programs to promote source control for both sanitary (septic tank and community systems) and storm sewer systems will emphasize the environmental and economic benefits of pollution prevention to both domestic and non-domestic dischargers. Source control is a relatively simple and inexpensive way to reduce the amount of toxic and hazardous materials discharged to the receiving environment from on-site and community waste water systems. Education of domestic dischargers will focus mainly on reduced water use, on the toxic or hazardous compounds typically present in consumer products, and on the availability of less harmful alternative products.

The components of a source control program will include the following:

1) The SCRD will develop an education strategy to inform domestic and non-domestic dischargers about the need for source controls, and what specific groups can do to ensure that the program results in reduced contaminant loadings to receiving marine and fresh waters. This effort will form a component of the District's overall educational program to ensure co-ordinated and cost effective delivery of educational services throughout the Regional District. A budget of $15,000 for producing the initial inventory of program materials is suggested.

2) Educational approaches will initially focus on areas where definite problems can be identified, and where positive results are likely to be obtained. Public education must include the proper use, operation and maintenance of septic tank/tile field systems.

3) The SCRD will take steps to publicize the source control program, particularly when successful results are achieved.

4) The SCRD will establish and maintain contact with knowledgeable representatives of other jurisdictions (e.g., the CRD, GVRD, RDN, City of Vancouver, the City of Kelowna, and provincial, state and federal agencies in Canada and the US), to share information on successful and

unsuccessful source control regulatory strategies, educational approaches, data collection and management, and possible funding sources for water quality monitoring programs.

3.2 Volume Reduction Program

Volume reduction programs, more commonly termed water conservation programs, are principally directed at reducing the need for costly water capacity expansion. Other benefits of water conservation programs include reducing the volume and therefore the cost of potable water treatment and wastewater treatment. In Halfmoon Bay, as in other semi-rural areas using on-site disposal reducing in-home water use will immediately transfer into reduced wastewater flows to septic systems. Further, reducing outdoor water use will lessen the potential for septic field saturation caused by excessive lawn watering and irrigation.

In order to reduce the quantity of flow that enters an on-site or community sanitary sewer system, the Regional District will develop a volume reduction program to reduce both indoor and outdoor water use.

The components of a volume reduction program will include the following:

1) Water Use Advisory Committee: The SCRD will recall this committee from time to time to evaluate program success and to develop new water conservation program ideas/incentives. A budget of $1,000 per year towards committee meetings, travel, costs.

2) Community outreach: The SCRD will budget towards staff time and materials for outreach to community groups, gardening clubs, ratepayer associations. Advertising in local paper, public information displays, community xeriscape garden projects will all raise public awareness. Budget $10,000.

3) School outreach programs: The SCRD will budget towards staff time and materials for school-based outreach. A budget of $5,000 towards this effort.

4) Water bills: Distribution of water conservation brochures in SCRD water bills. Budget amount $5,000.

5) Metering Master Plan: The SCRD Board commenced a metering master plan to layout a preferred strategy for a universal metering program (2002 Request for Proposal). In the SCRD 10 Year System Plan, $3.4 million was targeted for implementation of a universal metering program (subject to Board approval).

6) Mandatory toilet replacement program: The SCRD Board committed funds towards a toilet replacement program in the 2001 and 2002 budget. As of July 2005, approximately $2.7 million remains targeted for

toilet replacement in the 10 year System Plan.

7) Institutional programs: The SCRD will continue to lead by example with water efficiency initiatives at all SCRD public facilities. Most toilet retrofits were completed in 2001 and 2002. A budget of $2,500 will be considered for annual upgrades and retrofit programs including leak detection and repair as well as replacement of water inefficient appliances in all SCRD facilities.

3.3 Surface Water Management Program

Discharges resulting from surface runoff are known to degrade receiving water quality (fresh and saltwater). Surface water management for the protection of receiving water quality is a complex issue, due to the large number of potential contaminant sources and the transient nature of surface runoff events.

It will be recognized that surface water issues are best addressed on a regional basis, by considering drainage area boundaries rather than political boundaries. For effective surface water management, the issues of flood control, erosion control, and pollution control will ideally be coordinated on a watershed scale.

In Halfmoon Bay, as in other unincorporated areas of the SCRD, surface water is principally carried in open roadside ditches. These ditches are managed through the Ministry of Transportation. The purpose of these ditches is to channel surface water away from the road surface. In many cases, upland owners direct water into these ditches. Indirectly, overland flow of surface and sub surface water will be intercepted by these ditch features.

The components of a surface water management program will include the following:

1) The SCRD will formalize a best management practices guidebook for surface water and drainage management practices with the purpose of minimizing changes in surface and sub-surface drainage and minimizing water pollution as a result of land development. Consistent with the Halfmoon Bay OCP these practices will support the following:

- On-site retention of drainage and surface water runoff; use of open swales, ditches and natural watercourses to maximize infiltration and retain the natural functioning of watercourses, except if such use would compromise the value of watercourses for habitat and for public safety concerns;
- Subdivisions and development that minimize the amount of impervious surface;
- Maximize the use of vegetative cover to reduce runoff, prevent sediment from entering watercourse habitat, and increase the area available for infiltration of surface water;
- Development that does not result in:

a) significant increase in peak flows to any water system; and,
b) significant decrease in water quality;
c) runoff of contaminants, such as wash water from exposed aggregate concrete, painting, power washing, etc.;
d) runoff of sediments during land clearing, excavation or construction operations; and,
e) unnecessary removal of topsoil, causing the underlying less permeable soil to be exposed, that may reduce the infiltration and water holding capacity (OCP).

2) An overall drainage study based on criteria acceptable to the appropriate provincial government Ministries and consistent with a Liquid Waste Management Plan should be undertaken by a qualified person to address drainage difficulties that have been identified in the Plan area. An area of priority to be addressed in the drainage study is the Welcome Woods and Redrooffs Escarpment Areas within District Lot 1325 and District Lot 1324 (OCP). Budget $20,000 for study (2002 estimate).

The formation of a committee to coordinate surface water management issues was originally proposed as a component of the surface water management program. This has been removed from the LWMP as a result of the Integrated Stormwater Management Plan process currently being undertaken by the SCRD for selected OCP areas. Should this study indicate the need for a comprehensive program, surface water management planning will be pursued for all OCP areas within the Regional District.

3.4 Liquid Waste Management

The preferred waste management option as determined by the LWMP Public Liquid Waste Advisory Committee (LWAC) and through the public consultation process is Option 1 as described below. The public consultation process included public meetings related to a review of the Halfmoon Bay OCP conducted in 2001 and 2002 and the LWMP Open House #2 held August 11, 2002 (68% in favour of Option 1, see Schedule B). This decision is consistent with the policies of the Halfmoon Bay Official Community Plan. As well, Option 1 was seen to be the most responsible option for managing liquid waste from a social, economic and environmental perspective.

3.4.1 Option 1 Details

The preferred method of sewage disposal for new development is Option 1 for the Halfmoon Bay LWMP study area is land disposal utilizing either on-site systems (Type 1, 2 or 3) or small community package systems.

Future land parcel sizes within the Plan Area as designated by the

Halfmoon Bay OCP have been determined based on soil and related on-site sewage disposal servicing constraints.

The Vancouver Coastal Health Authority will continue to administer on-site systems until May 31, 2005, including permit issuance, approvals, inspections and orders. However, at the request of the Health Authority Option 1 introduces an on-site operation and maintenance program component. A phased O & M program including database construction, public information dissemination, and more regulatory initiatives is envisioned. The new Sewerage System Regulation administered under the *Health Act* came into effect May 31, 2005. No permits will be issued under the new regulation, which relies on authorized practitioners and professionals to conduct site assessments, inspections, and file appropriate documentation and system maintenance plans with both the Health Authority and the homeowner. Homeowners are then responsible for regular maintenance of their system according to the maintenance plan. The new regulation only applies to new on site systems. Permits will continue to be issued by the Health Authority for holding tanks. New subdivisions will continue to be subject to Vancouver Coastal Health Authority's *Subdivision Assessment Guideline*.

Existing small package treatment plants with ocean discharge are identified for phased upgrades to include pre-aeration, effluent filtration and disinfection. Existing facilities with ocean outfalls may be utilized to service those areas with known liquid waste disposal problems. Additional small community systems with land disposal are encouraged for new residential developments subject to Halfmoon Bay OCP Policies (Policies 7.11, 7.13, and 13.3). Additional ocean outfalls for new and existing development within the Plan Area are prohibited.

Provision for a marine pump-out facility is envisioned for the Secret Cove area. This is a fee for service proposal with capital cost anticipated from a variety of sources in consultation with Provincial/Federal funding (Environment Canada/GBEI) grants and Secret Cove Marina.

3.4.2 Septic system costs

For a single household the current installed cost of a conventional septic tank (Type 1 system) with drainfield ranges from $3,400.00 (conventional field) to $9,600.00 (mounded field). For a package treatment plant (Type 2) the costs range from $16,000.00 (conventional field) to $23,000 (mounded field). Details of replacement costs for individual owners of Type 1 and Type 2 on-site systems are presented in Schedule C.

3.4.3 On-Site Operation and Maintenance

The report prepared by the Vancouver Coastal Health Authority entitled *A Sanitary Survey of On-Site Systems* (Adams, 2001) recommended an on-

site management program for the Plan Area.

An on-site operation and management program is described in Schedule D. This program should be phased over a period of time. Initial efforts should be directed into building a database in those areas for which Ministry of Health records exist. Priority for on-site operation and maintenance should be given to those areas with known problems, i.e. beachfront areas, Eureka Road area, and those areas identified as problematic by the Ministry of Health. During the phasing of this program the Regional District will provide O&M educational materials to homeowners.

3.4.4 Overview of On-Site System Management

On-site management is proposed for individual parcels with Type 1, Type 2 or Type 3 systems. Management of on-site systems is defined as the routine inspection, maintenance and repair of on-site systems with the purpose of ensuring that systems are performing properly to protect:

- public health;
- natural environment;
- homeowner investment.

To maintain satisfactory performance, on-site systems need regular maintenance and monitoring to detect malfunctions. The new Sewerage System Regulation requires registered practitioners to file a maintenance plan with the homeowner and with the Health Authority for all new on-site treatment systems. The benefits of managed systems are numerous and include:

- ensuring performance of systems, thereby protecting public health and environment by detecting and repairing failures;
- reducing costs to property owners in semi-rural areas where connection to a sewer system may be expensive;
- protecting the property owner's investment in a house served by an on-site system, and thus maintaining property values;
- providing education to property owners on proper on-site system maintenance; and
- facilitating the approval and use of alternative and innovative technologies to overcome site constraints. (Managing these technologies is often a requirement of their use, as the systems often have valves, pumps, or filters requiring maintenance, periodic replacement or repair.

3.4.5 Vancouver Coastal Health Authority Responsibilities

Shared responsibilities between the SCRD and the Health Authority for the proposed program will include maintaining a database and sharing

information on historical records and new applications within the Regional District. As of June 1, 2005, permits will no longer be issued by the Health Authority for either the construction or operation of an on-site sewage system. The Health Authority will maintain a record of all documentation concerning site inspections, system construction and maintenance plans filed by registered practitioners in accordance with sections 8 and 9 of the Sewerage System Regulation. The SCRD will work with the Health Authority to develop and maintain a database, and to share information, on historical records and new applications within the Regional District. Educational materials would also be distributed to property owners following filing of documentation with the Health Authority.

3.4.6 SCRD Responsibilities

Under the proposed program, The Regional District receives and inputs data from the Health Authority regarding details of documentation filed for new systems. Pending specifications for maintenance listed in the maintenance plan, the Regional District notifies the homeowner by mail-out advising of the need to have a qualified person inspect the on-site system and make application for an SCRD Maintenance Certificate. The registered maintenance practitioner completes an application form to certify that the system is functioning properly. The homeowner receives a Maintenance Certificate. A nominal fee for service will be collected. The Maintenance Certificate will specify the conditions for the renewal of the certificate. This will vary for each system. For a Type 1 System, this will require an inspection by a qualified person and a pump-out, if deemed necessary, by the qualified person, within 5 years from the date of permit issuance, and every five years thereafter. The conditions set by the Regional District Maintenance Certificate will vary for Type 2 and Type 3 systems pending specifications of the maintenance plan filed by the registered practitioner for that system at the time of construction.

3.4.7 Homeowners' Responsibilities

Renewal of the Maintenance Certificate will require proof of:

- an inspection by a registered practitioner; and
- completion of work recommended during the inspection by a registered practitioner.

The BC Onsite Sewage Association and Royal Roads University have developed training courses for certification of on-site inspectors, installers, and maintenance providers.

Inspections would generally include the following:

- General description of the treatment and disposal system

- A general site evaluation
- Uncovering the septic tank to measure scum level, sludge and liquid level
- Inspection of general condition of the tank, outlets, baffles, distribution box
- Inspection of all mechanical parts
- A dye test at discretion of the inspector

Educational materials would also be distributed to property owners at the time documentation is filed with the Health Authority or of issuance of an SCRD Maintenance Certificate.

A component of the management program would be the development and maintenance of a database to manage data on each system. As program administrator, the Regional District, would operate the database system. Information for the database would come from documents filed with the Health Authority, inspections conducted by registered practitioners, septic tank pump-out receipts, and building inspection reports for new construction. Administrative needs other than fieldwork include an office and supplies, a computer with database access, printer and/or plotter, and provision for receiving cash or other forms of payment.

3.4.8 Homeowner Fees for On-Site O&M Program (2002 estimate)

An application fee is payable for a homeowner's Maintenance Certificate. Regional District bylaw to establish the permit process and fee structure.

The cost of issuing the 5 year Maintenance Certificate should be kept to a minimum, say $50.00 per lot ($10.00 per year) to cover administrative costs. The property owner's cost of contracting for the inspection – every fifth year approx. $125.00 ($25.00 per year) and the cost of a pump-out every fifth year (if required) approx. $200.00 ($40.00 per year).

Total 5 year cost approx. $175.00 ($35.00 per year), if pump-out not required.

Total 5 year cost approx. $375.00 ($75.00 per year), if pump-out required.

3.4.9 Upgrade Existing Community Collection and Treatment Systems *and* Outfalls[1] *(figures are approximate only based on BC Hydro Water and Wastewater Centre, SCRD Information, and Sunshine Coast Engineering Ltd., August 2002)*

Existing community wastewater collection and treatment systems will be

[1] The Halfmoon Bay community has expressed an interest in exceeding Provincial Standards for BOD/SS of 45-45. The cost of funding upgrades to the existing treatment plants may be extended outside the sewer service area to include the entire Plan Area tax base

retained and upgraded to meet LWMP objectives. Consistent with the OCP Policy 13.3(b) and the SCRD Subdivision Servicing Standards bylaw 320, in the case of the multi-family designation and community sewage treatment systems, any proposed development shall not include a community sewage treatment system utilizing a new facility for ocean disposal of treated effluent (see Subdivision Servicing Standards, Schedule I).

Upgrading the existing community collection and treatment facilities to a 10-10 (BOD/TSS) standard of secondary treatment followed by tertiary treatment and extension of outfalls to 300 m from shore is required to meet the LWMP objectives.

Option 1 includes a boat holding tank pump out facility located at the Secret Cove Marina. It was assumed that wastes from the boat holding tank facility would be trucked to the nearest suitable treatment facility for Option 1 (e.g., the District of Sechelt treatment plant). This facility could be either publicly or privately owned and operated. Public ownership was assumed for this analysis. Capital and operating costs would be offset by user fees.

Annual recovery costs on capital investment for publicly owned community treatment facilities were calculated assuming a 20 year capital cost repayment schedule at 6.5% interest. Results are presented in Schedule E. Details of existing Pollution Control Permits issued by the Provincial Waste Management Branch are presented in Schedule F. The prescribed upgrade for each sewage treatment facility utilizing an ocean outfall (public and private) will ensure a similar treatment standard for each facility. This standard will include, but is not necessarily limited to:

- BOD/TSS of 10-10
- aeration
- sand filtration
- UV disinfection, and
- A minimum outfall length of at least 300 metres from low water mark to the nearest shoreline

3.4.10 Other Private Systems with Ocean Outfalls

Existing private sewage treatment systems will be encouraged to upgrade with pre-aeration, filtration and UV disinfection (not chlorination). Timing of upgrades will be tied to compliance with new operating certificate. Where possible, adjacent homeowners with sub-standard sewage disposal systems (direct discharge) will be encouraged to connect to private plants. Grants and other financing should be considered.

3.4.11 Direct Discharge

Direct discharge into the marine waters of the Plan Area is deemed by this Plan as unacceptable. These situations shall be rectified using on-site treatment with ground disposal. In certain instances small community treatment facilities with ground disposal should be considered.

3.4.12 Install Boat Holding Tank Pump Out Facility at Secret Cove

A pump out facility for boat holding tanks is envisioned for the Secret Cove area. Total and annualized costs are presented in Schedule G.

3.4.13 Existing and Future On-Site Problem Areas

Option 1 of the Halfmoon Bay LWMP recognizes those areas within the Plan Area identified by the Vancouver Coastal Health Authority (Adams, 2001) as unsuitable for the long-term use of on-site systems. These areas are identified on Schedule A and are listed as follows:

1. The area around the Halfmoon Bay Wharf, which includes Mintie and O'Brian Road (portion of DL 1638). Adams (2001) recommends that this area be sewered and connected into the treatment plant at Curran Road.
2. The Brooks Cove Area, which includes Brooks, Sherman and Frenchman's Lane (portion of DL 2394)
3. The Sans Souci Road area (DL 4551 and DL 4552)
4. Backhouse Road (portion of DL 4537)

In the event that on-site ground disposal (Type 2 or 3 system) or a small community treatment system with ground disposal is not practical, connection to the nearest existing sewage treatment facility utilizing ocean disposal is supported. Connecting those areas identified by Schedule A to an existing facility with an ocean outfall shall only be available to existing homes and existing properties. Consistent with OCP Policy 13.3(b) and the SCRD Subdivision Servicing Standards bylaw, additional ocean outfalls are prohibited by this Plan (see Schedule I).

4.0 IMPLEMENTATION SCHEDULE, COSTS, FINANCING

Implementation schedules, program and project cost estimates, and financing and cost recovery measures are presented in Schedule H.

4.1 Implementation Schedule and Costs

This Plan outlines program and project elements and their associated costs that will provide liquid waste management for the residents of Halfmoon Bay over the next 20 years or more. The Regional District will construct, modify, expand and upgrade community sewage facilities in a staged manner in sequence with other Infrastructure Services priorities subject to funding. Implementation of educational programs, cost benefit studies, and other studies will commence with the Regional District Board's approval of the Plan.

The estimated costs (2002 $) for program elements and capital projects along with a schedule for implementation are presented in Table 1 of Schedule H.

As noted throughout the Plan, costs are presented in 2002 dollars. Actual costs will be dependent upon the cumulative impact of inflation between 2002 and the actual year of construction.

Every effort will be made to meet the objectives of the Plan at costs lower that those presented.

4.2 Proposed Financing

Financing requirements for Plan implementation are summarized in Table 2 of Schedule H. The SCRD will borrow funds required to implement the LWMP from Municipal Finance Authority or from the private sector as required to ensure the most favourable rates and repayment schedule.

5.0 APPROVAL, MONITORING AND AMENDMENTS

5.1 Board Approval of Stage 2 and 3 Reports

The Stage 2 and 3 Reports for the Halfmoon Bay Liquid Waste Management Plan were approved by the Sunshine Coast Regional District on September 12, 2002 by the following Board Resolution:

> ***Recommendation No. 9 –*** *Halfmoon Bay LWMP – Stage 2 and 3 Reports*
>
> *THAT the 'Halfmoon Bay LWMP – Stage 2 and 3 Reports' report be received;*
>
> *AND THAT Stage 2 and Stage 3 Reports be approved and forwarded to Ministry of Water, Land and Air Protection (Waste Management) for consideration and approval with the proviso that the following appendices be attached:*
>
> *1) Storm Water map (provided by MoTH)*
> *2) On-Site System Management report (provided by Coast Garibaldi Health Services Society)*
> *3) Water Testers report (provided by Halfmoon Bay Community School Volunteer Water Testers)*
>
> ***CARRIED***

The following amended wording to the Halfmoon Bay OCP Policy 13.2 (Bylaw 325.12) provides the necessary approval for the Regional District to implement this plan without the approval of the Minister of Water, Land and Air Protection:

> *The methods of sewage disposal for the Plan area shall consist of those currently in place as depicted on Schedule A5 and shall be consistent with a liquid waste management plan prepared by the Regional District.*

The OCP Policy was received by the SRCD Board and read a third time as amended on July 21, 2005 (see resolution below).

Bylaw 325.12	J. Marian / C. Fisher
492/05	THAT "Halfmoon Bay Official Community Plan Amendment Bylaw No. 325.12, 2005" be read a third time as amended.

CARRIED

5.2 Monitoring and Reporting

The SCRD will track the implementation of this Plan by preparing a brief Halfmoon Bay LWMP Annual Report summarizing the tasks proposed in the Plan and the progress of the Plan.

The LWMP Report will summarize the effectiveness of the source control, volume reduction and surface water management programs. In addition, progress made on the liquid waste management (Option1) component of the Plan will also be reported.

A Plan Monitoring Committee, incorporating members from the general public, SCRD staff, locally elected officials and provincial/federal agencies will be formed by the SCRD to monitor progress in implementing the Plan. The SCRD shall draft the Plan Monitoring Committee terms of reference. The Plan Monitoring Committee will report to the Regional District Board through the appropriate SCRD Committee.

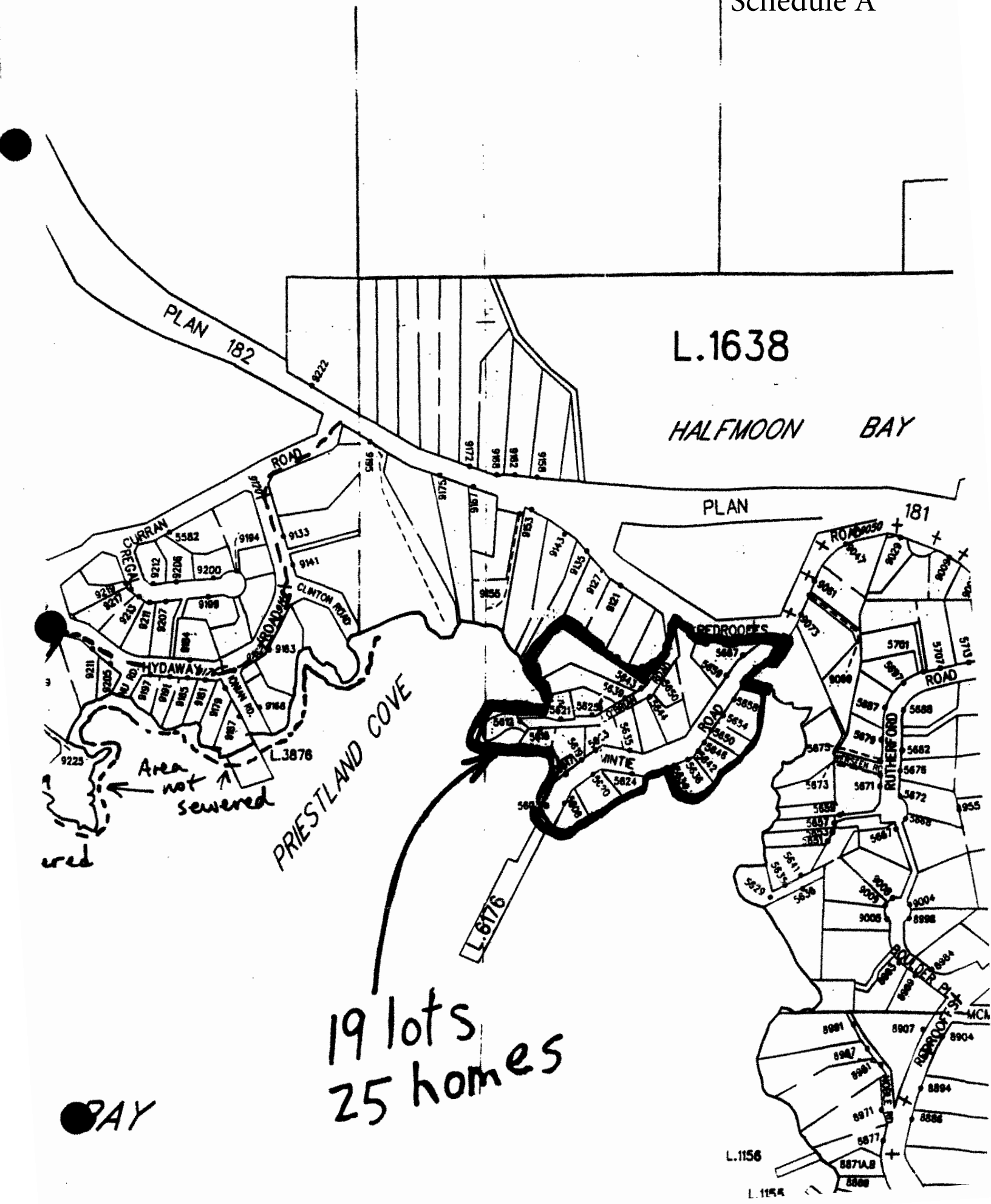
5.3 Amendment Process

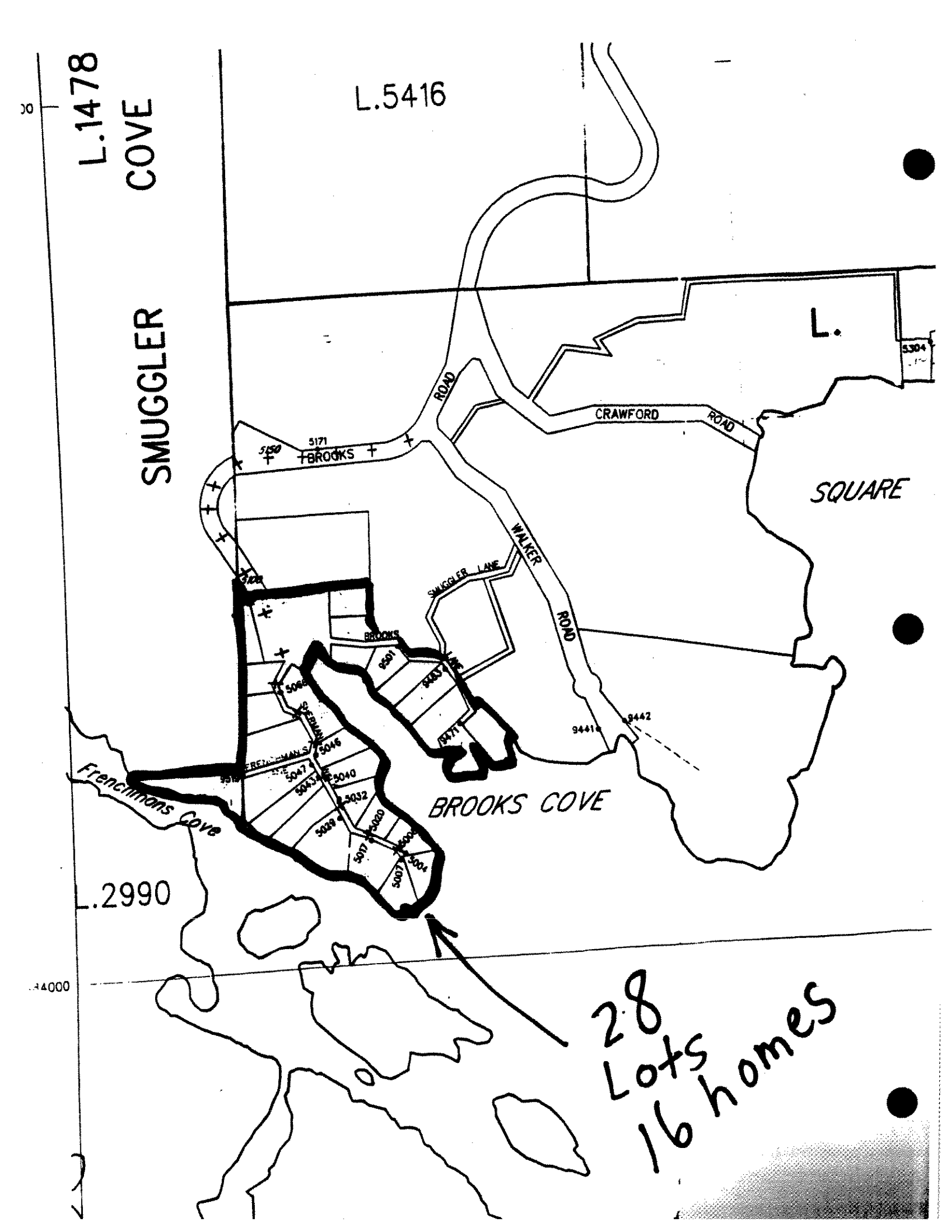
Changing factors such as an OCP amendment, land development activity, population growth, technological innovation, and climate change may necessitate deviations from the approved Liquid Waste Management Plan. The LWMP is a living and dynamic document. Amendments to the plan may be considered during regular plan reviews to take place every five years, and must meet with SCRD Board approval. This review process will include public participation.

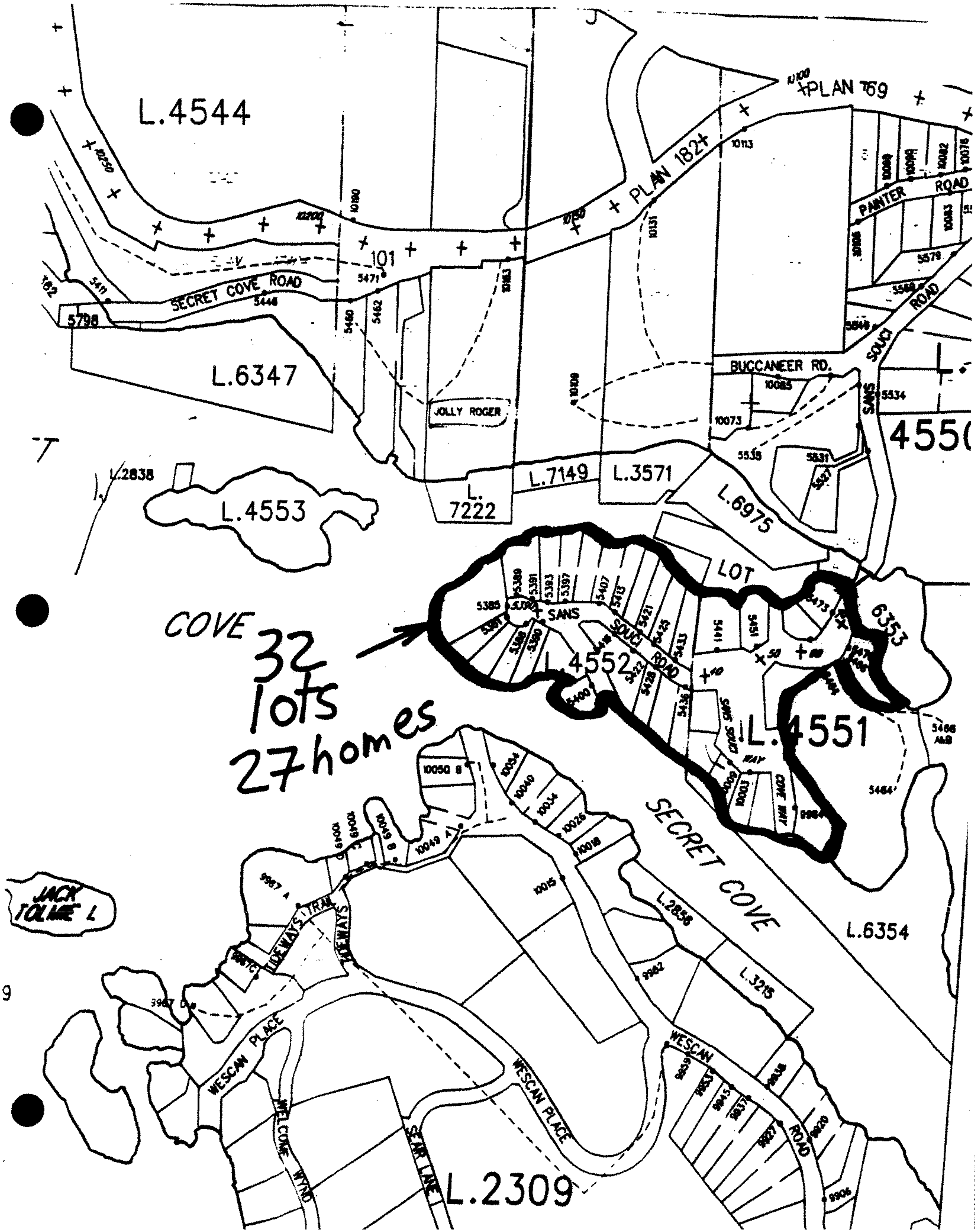
Schedule A

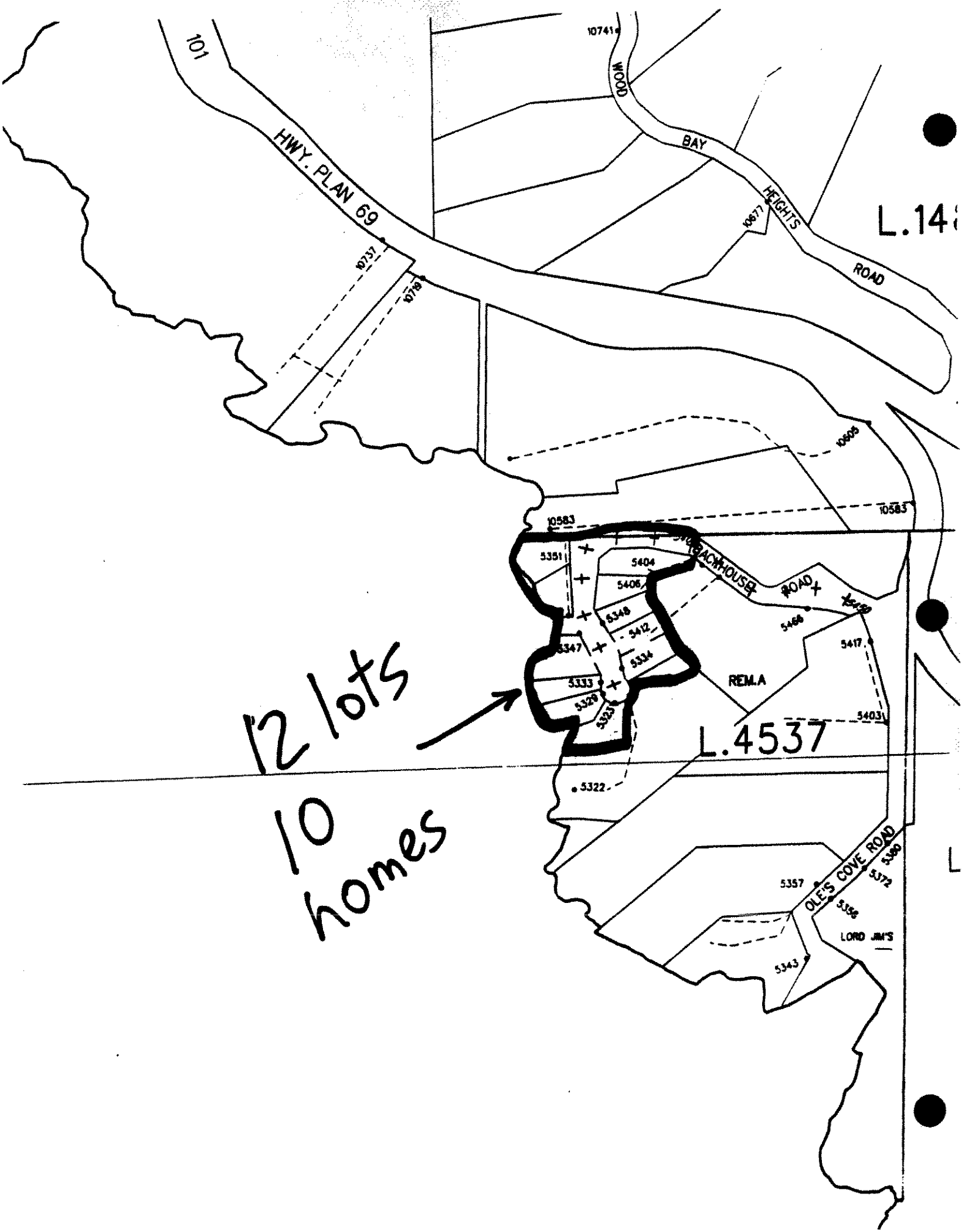
Current Problematic Areas

Schedule A


PLAN 182
L.1638
HALFMOON BAY
PLAN 181
ROAD
CURRAN
CREGAN
CLINTON ROAD
HYDAWAY
CROWN RD.
L.3876
Area not sewered
PRIESTLAND COVE
L.6176
19 lots
25 homes
REDROOFFS
RUTHERFORD
BOULDER PL
L.1156
BAY


L.1478
COVE
SMUGGLER
L.5416
L.
5304
ROAD
CRAWFORD ROAD
SQUARE
5171
BROOKS
WALKER ROAD
SMUGGLER LANE
BROOKS
9501
9483
9471
9442
9441
5046
5047
5043
5040
5032
5009
5007
5004
Frenchmans Cove
BROOKS COVE
L.2990
28 Lots
16 homes


L.4544
PLAN 769
PLAN 182
101
SECRET COVE ROAD
5798
L.6347
JOLLY ROGER
PAINTER ROAD
BUCCANEER RD.
SANS SOUCI ROAD
4550
L.7149
L.3571
L.7222
L.2838
L.4553
L.6975
LOT 6353
COVE
32 lots
27 homes
SANS SOUCI ROAD
4552
L.4551
SANS SOUCI WAY
COVE WAY
SECRET COVE
L.6354
JACK TOLMIE L
SIDEWAYS TRAIL
SIDEWAYS
L.2858
L.3215
WESCAN PLACE
WESCAN ROAD
WELCOME WYND
SEAR LANE
L.2309


101
HWY. PLAN 69
WOOD
BAY
HEIGHTS
ROAD
10741
10737
10738
10677
10605
10583
10583
5351
5404
5406
5348
5412
5347
5334
5333
5328
5323
5322
BEACHHOUSE
ROAD
5466
5417
REM.A
5403
L.4537
OLE'S COVE ROAD
5360
5372
5357
5356
LORD JIM'S
5343
12 lots
10
homes

Schedule B

August 11, 2002 Open House Questionnaire Results

Halfmon Bay - Liquid Waste Management Plan
Open House #2 Questionnaire August 11, 2002
HERE IS WHAT YOU SAID

1. **Of the THREE OPTIONS presented here today which one do you most favour?**
- ❑ OPTION 1 **68%**
- ❑ OPTION 2
- ❑ OPTION 3 **4%**
- ❑ NONE OF THESE **28%**

2. **How long has your present sewage disposal system been in operation?**
- ❑ Less than 1 year **3%**
- ❑ 1 – 10 years **22%**
- ❑ 11 – 20 years **43%**
- ❑ more than 20 years **27%**
- ❑ more than 40 years **4%**

3. **How is the liquid waste in your home treated?**
- ❑ On-Site Septic (Type 1) **63%**
- ❑ On-Site Package Treatment Plant (Type 2) **21%**
- ❑ On-site "Innovative Systems",(Type 3) **4%**
- ❑ Community sewer – land disposal **1%**
- ❑ Community sewer – ocean discharge **10%**

4. **Have you ever experienced any problems with your on-site or community system**?
- ❑ YES **20%**
- ❑ NO **80%**

5. **If you answered YES to Question 4, are you satisfied that the problem been corrected?**
- ❑ YES **100%**
- ❑ NO
- ❑ Not applicable

6. **Are you aware of problems with on-site systems in your neighbourhood? ie. smell, leakage**
- ❑ YES **34%**
- ❑ NO **66%**

7. **Do you feel the amount you pay for liquid waste disposal (ie. septic pump-out, sewer charges, maintenance, operation) is:**
- ❑ Far too much **3%**
- ❑ Too much **5%**
- ❑ About right **78%**
- ❑ A total bargain **13%**

8. How have you learned to maintain your onsite system?

- ❑ Done by a paid contractor **37%**
- ❑ Information from Coast Garibaldi Health **19%**
- ❑ Information from Septic pumpers **26%**
- ❑ Information from family, friends, neighbour **15%**
- ❑ I am unsure how to maintain a system **3%**
- ❑ Other _____

9. Who do you think should be responsible for ensuring that septic systems are not polluting the environment and are working efficiently? Choose one or more answers

- ❑ Homeowner – as individual **32%**
- ❑ Homeowner – through private contractor **13%**
- ❑ Ministry of Health **28%**
- ❑ Regional District **28%**
- ❑ Other

10. Do you feel some sort of onsite maintenance program is necessary to ensure homeowner are maintaining their systems to a healthy standard?

- ❑ YES **85%**
- ❑ NO **10%**
- ❑ UNSURE **5%**

11. If yes to question 10, what type of maintenance program would you prefer?

- ❑ Homeowner Education, ie. mail-out pamphlets **28%**
- ❑ Incentives/voluntary participation, partial record **16%**
- ❑ Full records, mandatory pump-outs **20%**
- ❑ Full records, Mandatory pump-outs, inspections, 5 year certificate **36%**

12. Would you like to see more small community systems with land disposal that would eliminate the need for more on-site septic systems?

- ❑ YES **53%**
- ❑ NO **47%**

13. Would you like to see more sewer outfalls disposing very high quality treated effluent (tertiary) to eliminate the need for more on-site septic systems?

- ❑ YES **36%**
- ❑ NO **64%**

14. Would you be willing to accept ocean disposal of high quality treated effluent to assist and repair existing homes on septic with known environmental problems?

- ❑ YES **27%**
- ❑ NO **73%**

Schedule C

Replacement Costs for Individual Owners of On-Site Systems (2002 estimates) (Type 1 and Type 2 Systems)

Replacement Costs for Individual Owners of On-Site Systems (Type 1 and Type 2 Systems)

a) septic tank with conventional field (replacement costs)

-	capital cost $3,400 incl. GST	
-	replace septic tank and field in 30 years	$115.00/yr
-	pump out septage every 5 years (O&M)	$40.00/yr
Annualized replacement cost (based on 30 years)		**$165.00/yr**

b) septic tank with mounded field

-	capital cost $9600.00 incl. GST	
-	replace septic tank and field in 30 years	$320.00/yr
-	pump out septage every 5 years	$40.00/yr
Annualized replacement cost (based on 30 years)		**$360.00/yr**

c) package plant and conventional field

-	capital cost $16,000 incl. GST	
-	replace existing system in 30 years	$530.00/yr
-	contract for package plant, incl. solids removal	$300.00/yr
Annualized replacement cost (based on 30 years)		**$830.00/yr**

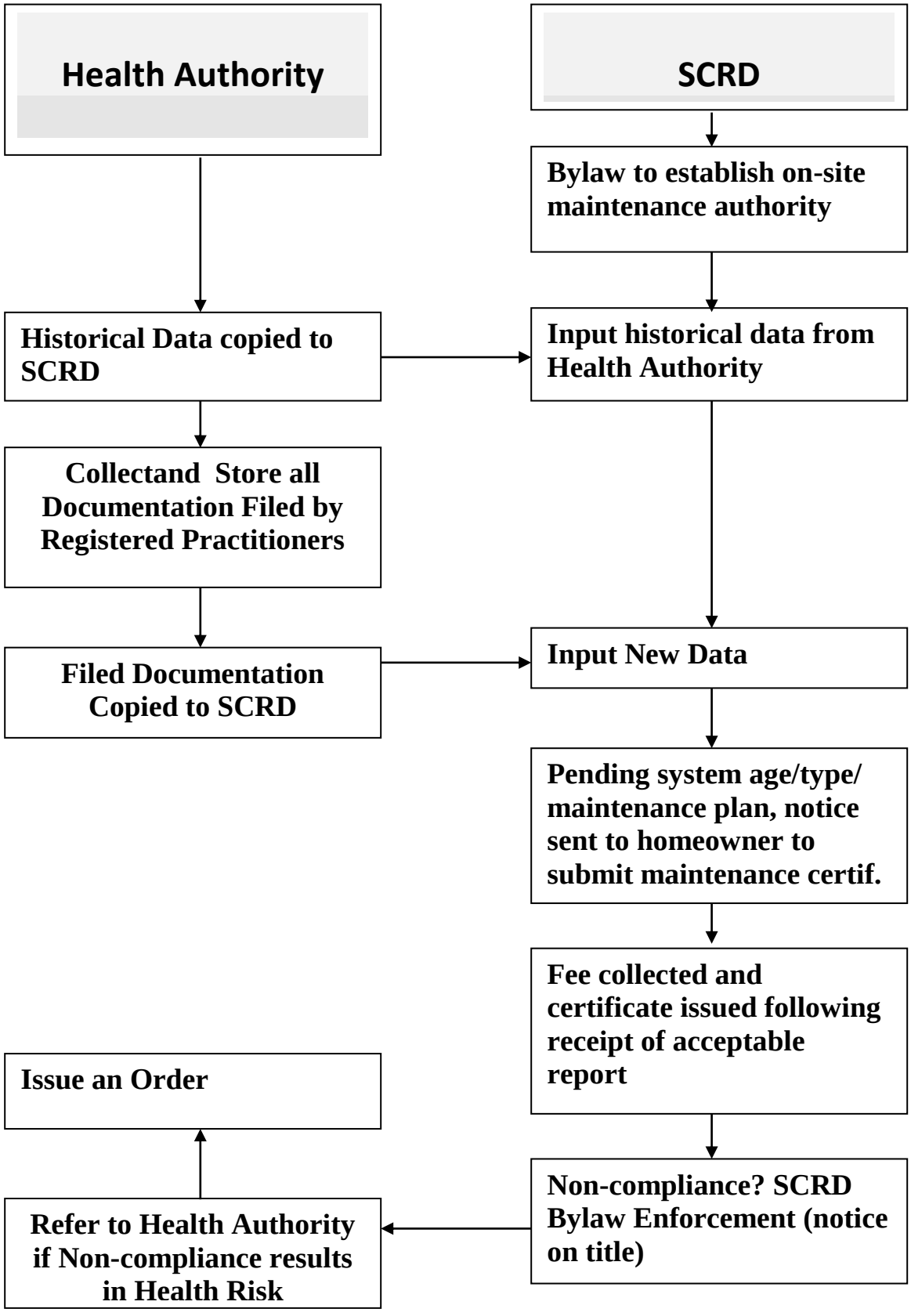
d) septic tank with package plant (Type 2 Systems) and mounded field

-	capital cost $23,000 incl. GST)	
-	replace existing system in 30 years	$760.00/yr
-	contract for package plant, incl. solids removal	$300.00/yr
Annualized replacement cost (based on 30 years)		**$1060.00/yr**

Schedule D

Proposed On-Site Systems Co-Management Scenario

Vancouver Coastal Health Authority/SCRD On-site Co-Management Scenario



Schedule E

Annual Recovery Costs on Capital Investment for Publicly Owned Community Treatment Facilities (2002 estimates)

Square Bay Facility (93 lots total, 75 lots currently connected)

-	extend outfall by 100 m (@ $45 per metre installed)	$4,500
-	add UV disinfection (BC Hydro Water and Wastewater Centre)	$50,000
-	add effluent filtration	$100,000
	Total Capital Cost *(estimate, assumes no grants)*	**$154,500**
	Less contribution from reserve fund	$50,000
	Actual Capital Cost *(at 6.5% over 20 years, assumes no grants)*	**$104,500**
	Total Annualized Cost *(6.5% over 20 years)*	$10,000
	Total Annual Capital Cost **per Lot** *(based on 93 users)*	**$110.00*/yr***
	Current Operation and Maintenance (2002)	$330.00/yr
	Current Frontage Fee (2002)	$100.00/yr
	Sub-Total ***(Current charges)***	**$430.00/yr**
	Annual increase for upgrades (as above, estimate only)	$110.00/yr
	Total Annual Payment per lot (annualized capital + O&M)	**$540.00/yr**

- **Secret Cove Condominium Facility (33 user charges, 1 commercial charge)**

- extend outfall by 300 m ($45 per metre, 50% allocation to Secret Cove Condos, 50% allocated to Jolly Roger)	$7,000
- pre-aeration treatment	$13,000
- add UV disinfection (BC Hydro Water and Wastewater Centre)	$50,000
- add effluent filtration	$30,000
Total Capital Cost *(estimate, assumes no grants)*	**$100,000**
Less contribution from Reserve Funds	$15,000
Actual Capital Cost *(at 6.5% over 20 years, assumes no grants)*	**$85,000**
Total Annualized Cost *(6.5% over 20 years)*	$8,000
Total Annual Capital Cost per Lot *(estimate based on 34 users)*	**$200.00*/yr***
Current Operation and Maintenance (2002)	$330.00/yr
Current Frontage Fee (2002)	$100.00/yr
Sub-Total ***(Current charges)***	**$430.00/yr**
Annual increase for upgrades (as above, estimate only)	$200.00/yr
Total Annual Payment per lot (annualized capital + O&M)	**$630.00/yr**

- **Jolly Roger Resort Facility (35 users, 1 commercial user)**

- extend outfall by 300 m ($45 per metre, 50% allocation to Secret Cove Condos, 50% allocated to Jolly Roger)	$7,000
- pre-aeration treatment (est. Sunshine Coast Eng. Ltd)	$13,000
- add UV disinfection (BC Hydro Water and Wastewater Centre)	$50,000
- add effluent filtration	$30,000

Total Capital Cost *(estimate)*	**$100,000**
Less contribution from Reserve Funds	$15,000
Actual Capital Cost *(at 6.5% over 20 years, assumes no grants)*	**$85,000**
Total Annualized Cost *(6.5% over 20 years)*	$8,000
Total Annual Capital Cost per User *(estimate based on 36 users)*	**$200.00*/yr***
Current Operation and Maintenance (2002)	$330.00/yr
Current Frontage Fee (2002)	$100.00/yr
Sub-Total **(Current charges)**	**$430.00/yr**
Annual increase for upgrades (as above, estimate only)	$200.00/yr
Total Annual Payment per lot (annualized capital + O&M)	**$630.00/yr**

Schedule F

Existing Pollution Control Permits Within the Plan Area

Provincial Waste Management Branch
Pollution Control Permits

Plant name	Local Name	Permit #	Authorized discharge rate	BOD/TSS* (mg/L)	Outfall length** (metres)
Lord Jims		PE 5742	45 m^3/day	unavailable	unavailable
Secret Cove and Jolly Roger	Secret Cove and Jolly Roger	PE 4769	114 m^3/day (combined)	45 / 60 mg/L	950m, mouth of cove, 25m depth
William Ovalle Joan Anne Marshall		PE 6041	3.5 m^3/day (2 homes with 2 septic tanks)	Typical septic tank effluent	450 metre outfall 130 m to shore 35m depth
Halfmoon Bay Developments Ltd.	Square Bay	PE 375	171 m^3/day	45 / 60 mg/L	220m 35m depth
Halfmoon Bay Properties	Curran Road	PE 5779	200 m^3/day	45 / 60 mg/L	175m 46m depth

***BOD** = 5-day biochemical oxygen demand*
***TSS**= Total suspended solids*
***Outfall length** as indicated on permit, not necessarily as built and not necessarily distance from nearest shore*

Schedule G

Cost Estimates for Secret Cove Pump Out Facility
(2002 estimates)

Cost Estimates for Proposed Boat Holding Tank Pump Out Facility at Secret Cove

Total Capital Cost (construction of facility)	$50,000
Total Annualized Capital Cost (no grants)	$4,000
Average Annual O&M cost (not incl. transportation and disposal)	$5,000
Total Annual Cost	$9,000

Schedule H

Implementation Schedules, Program and Project Cost Estimates, Financing and Cost Recovery (2002 estimates)

TABLE 1
GROSS COST ESTIMATES AND SCHEDULE

Programs and Projects	Cost Estimate (2002$)	Funding Source	Schedule
1. Source Control Program		*(combination of)*	
- Community Outreach	$10,000	- Area B	2004/2010
- Education Program	$5,000	- SCRD Regional	
- Monitoring	$5,000	- Prov. Grants	
		- GBEI	
		- Env. Canada	
2. Volume Reduction Program			
- Metering Master Plan	$10,000		2002
- Toilet Program	$3.4 million	- SCRD Regional	2004/2013
- Metering Program	$3.4 million		2004/2013
- Education Program	$10,000		2003/2010
- Community Outreach	$10,000		2003/2010
- SCRD Retrofits	$10,000		2003/2008
- Monitoring	$5,000		2003/2010
3. Surface water management program		*(combination of)*	
- Drainage Study (Redrooffs)	$20,000	- SCRD Regional	2006/2010
- Education Program	$5,000	- Planning Grant	2004/2010
- Bylaw Preparation	$5,000	- GBEI	2004/2006
4. **Liquid Waste Options**		*(combination of)*	
- Onsite O&M (education)	$5,000	- GBEI	2004/2010
- Onsite O&M (data base and notification	$10,000	- Env. Canada	2004/2008
- Onsite O&M Certificate	$30,000	- Planning Grant	2006/2010
- No marine dumping signage	$5,000	- Electoral Area B	2006/2008
- Boat pump out facility	$50,000	- User Pay	2006/2008
- Upgrade existing treatment plants	$50,000	- SCRD Regional	2006/2008
- Areas unsuitable for long-term systems	$274,000	- Service Area	2004/2008
			2006/2010

GBEI *– Georgia Basin Ecosystem Initiative*

TABLE 2
FINANCING REQUIREMENTS (2002$)

Programs and Projects	2003/2005	2005/2008	2008/2020
Source Control	$5,000	$5,000	$10,000
Volume Reduction	$10,000	$10,000	$35,000
Surface Water Management	$25,000	$5,000	$5,000
Liquid Waste Management	$60,000	$40,000	$274,000

Schedule I

Subdivision Servicing Standards: Sewage Disposal

Consolidated April 2005 to incorporate up to 320.14

SUNSHINE COAST REGIONAL DISTRICT

BYLAW NO. 320

SUBDIVISION SERVICING BYLAW

A bylaw to regulate or control the subdivision of
land pursuant to the provisions of
Division (7), Part 29 of the Municipal Act.

300 **Servicing Requirements**

Works and service shall be provided in accordance with Schedule `A' of this bylaw and meet the subdivision regulations under the Local Services Act.

301 Sewage Disposal

1. Prohibition of Sewage Ocean Outfalls within the Halfmoon Bay OCP Area and the Roberts Creek OCP Area

1.1 No sewage ocean outfalls shall be constructed for the purpose of disposing of sewage effluent