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Doing the Right Things at the Capital Regional District – Burgoyne Septage Facility

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Making a difference...together

Presentation

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- Burgoyne Septage Facility – Salt Spring Island, BC
  - Introduction – Burgoyne Septage Facility
  - How & Why the Facility Exists
  - Facility Phases – From Pilot Project to CRD
  - Plant Process
  - Facility Capital & Operating Costs
  - What's Next ? – Biosolids Composting
  - Lessons Learned

Introduction

Making a difference...together

- Doing the Right Things at the Capital Regional District – Burgoyne Septage Facility
  - Island community that chose to handle septage and sludge on-island
  - Proven results in treating raw domestic septage and municipal sewage sludge to a high level
  - Developing a pilot project to compost biosolids at septage facility
- Salt Spring Island
  - Access by BC Ferry
  - 10,000 residents

Location

- Salt Spring Island

How & Why Facility Exists

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- SSI Liquid Waste Disposal Local Service Area – established in 1993
  - Residents desired to handle all septage on island
  - CRD already operating Ganges WWTP
  - Local septage hauler facing problems with disposal methods
  - CRD held referendum for establishment of local service
- Current Service Area
  - 5530 residential properties
  - Parcel tax = $42.10

How & Why Facility Exists

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- Local Service - Defined
  - Regional Government Boards may establish & operate a ‘local service’ under provisions of Local Government Act
  - Establishing Bylaw – assent of electors in service area
  - Annual costs recovered through parcel tax, user fee, revenue
  - Subsequent bylaws to regulate fees & charges for service
  - Local service is represented by local committee on behalf of CRD Board

Phases – Pilot Project

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- Methods of treatment & disposal have evolved over past 15 years

- 1993 – Exfiltration lagoons
  - Lagoons considered acceptable method of disposal
  - Constructed and operated at low cost
  - Despite soil analysis, lagoons did not exfiltrate at expected rates, leading to capacity issues
  - By 1995 – alternative method of treatment & disposal required

- 1996 – Tanker Storage and Hauling
  - Very costly & did not meet intention of the local service

Phases – Pilot Project

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- 1997 – Need to explore cost effective & long term solution

- RFP for supply and operation of a septage receiving, dewatering &treatment facility
  - Private operator offered design-build solution
  - Guaranteed effective dewatering, tertiary treatment of filtrate, ground disposal on-site
  - Project constructed and operated by private operator as a pilot through 1998
  - Pilot success – Private contract extended through 2002

- 2003 – CRD acquired facility & land

Septage Facility

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Septage Facility

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- Overview

  - Almost 900,000 imperial gallons (igal) processed annually at facility
    - 530,000 igal of domestic septage and grease trap waste
    - 290,000 igal of sludge from two municipal wastewater treatment plants
    - 50,000 igal of waste sludge from Burgoyne process

  - High Level of Treatment:

	Influent	Effluent
Biochemical Oxygen Demand (BOD5 mg/L)	10,000	<4
Chemical Oxygen Demand (COD mg/L)	16,000	<4
Total Suspended Solids (TSS mg/L)	20,000	<10
Faecal Coliform	>10,000,000	<1

  - Facility operated by one full time operator

Septage Process

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- Receiving
  - Haulers discharge to a 100mm connection at 250 igpm
  - Spills are contained on a concrete pad
- Metering
  - Flows are measured with a magnetic flow meter
  - Haulers record total flow and are charged $0.225/igal

Septage Process

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- Sludge Screening
  - Flows discharge on to a 13mm manual bar screen
  - Screened sludge passes through a degritting tank
  - Sludge then flows by gravity to lift station
- Sludge Storage
  - Sludge is pumped to two 20,000 igal storage tanks

Septage Process

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- Sludge Dewatering
  - Diluted polymer is metered into sludge from the storage tanks and then pumped into the dewatering system
  - Sludge is pumped into a flocculator and then a single channel 1.2m diameter Fournier Rotary Press

Septage Process

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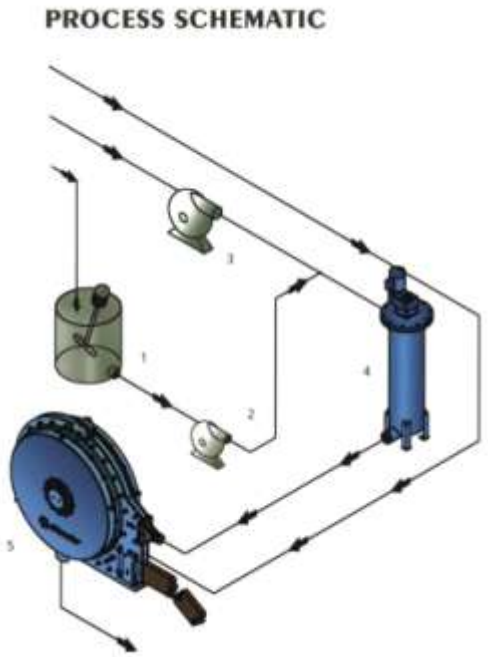

- Sludge Dewatering
  - The sludge is dewatered as it is forced through the revolving screens and restricted at the outlet
  - The dewatered cake discharges to a conveyor and the press filtrate is pumped to two 20,000 igal storage tanks

Septage Process

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- Solids Handling
  - Dewatered solids are currently batched in covered bins and transported to a Vancouver Island
  - Approximately 20 metric tons are hauled to landfill every two weeks

Septage Process

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- Filtrate Treatment
  - Filtrate is pumped from storage to the 3000 igal aerated membrane bioreactor tank
  - Permeate pump applies a vacuum to the hollow fiber ultra filtration membranes

  - All particulate matter >0.1 microns is filtered out
  - 1,000 igal sludge wasted weekly to maintain 17,000 mg/L of mixed liquor suspended solids in tank

Septage Process

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- Liquid Disposal
  - Treated effluent is discharged to a conventional pressure field on site with 180m of pipe

Costs

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- Capital Costs
  - Facility construction & equipment costs (1997) - $250,000
  - Land costs – 20 acre portion in ALR (2003) - $390,000
- Annual Operating Revenue & Expenditure
  - **Revenue** - $410,374
    - Tipping Fees $182,500
    - Parcel Tax $221,200
    - Budget Surplus $6,674
  - **Expenditure** - $410,374
    - Solids Handling & Disposal Costs $100,000
    - Operations Labour Costs $82,570
    - Electricity, Testing, Chemicals $32,965
    - Engineering & Administration $19,290
    - Repairs & Maintenance Materials $5,100
    - Debt Expenditures (Land) $78,114
    - Operating Contingency $92,335

Biosolids Composting

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- Satisfies original intent of local service
  - Local service now has financial stability
  - Tipping fees increasing at landfill to $150/ton
- Pilot compost facility - Transform Compost Systems
  - Test process & allow CRD to gain experience
  - Determination of operational costs
  - Secure on-island sources for green wood waste
  - Develop markets for finished compost product

Biosolids Composting

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- Compost Facility – Approvals
  - OMRR - Facility, process and end product
  - CRD Bylaw 2736 – Compost Licence
  - Islands Trust Land Use Bylaw - DVP
  - Agricultural Land Reserve – Facility and site use

- Design Criteria
  - Capacity - 2,300 tonnes of biosolids + amendment per year = 1,700 tonnes of finished material
  - Start up budget - $100,000

Biosolids Composting

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- Compost Facility Components
  - Amendment storage – 15 days of production
  - Mixer – Supreme Enviroprocesser 300
  - Tractor loader – with 80hp PTO for mixer
  - Four static aerated composting pads
    - Each 3.7m wide x 1.5m high x 18.3m long
    - Poly ground cover for leachate control
    - Aeration system – 2-75mm pipe runs, 2 – 0.5hp blowers
    - Temperature monitoring, recording & control system
  - Curing & finished compost storage area

Biosolids Composting

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- Compost Process – Active Composting Phase
  - Weekly – biosolids and wood mixed – 1:1 ratio based on weight or 3-4:1 on volume basis (biosolids:wood)
  - Static windrows constructed and covered
  - Windrows aerated with electronically controlled blowers – based on temperature feedback
  - At 14 days compost is turned for a further 14 days
  - During 4 weeks – temperatures must be >40° C for more than 15 days and >55° C for a period of not less than 10 days
  - Moisture content of compost 60-65% during process

Biosolids Composting

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- Compost Process – Curing Phase
  - Material is moved to curing area for 90 days of curing
  - Finished product is screened to 12mm to remove large wood (for reuse) and plastics
  - Cured material meets OMRR for pathogen reduction
  - Finished product sampled & analyzed to meet OMRR
  - Produce Class A compost with unrestricted use – CRD will recommend non-food crop use

Considering a Facility?

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- Lessons Learned After 15 Years…..
  - Location, location, location – select location that meets local land use regulations and provides flexibility
  - Establish relationships with neighbors
  - Treat operator right – working conditions less than desirable
  - Hauling offsite has been problematic – costs, ferry travel, odour, no control over tipping fees

Considering a Facility?

Making a difference...together

- More Lessons Learned….
  - Local tipping fees must remain competitive with nearby septage facilities
  - Recent source control regulations – large quantities of grease causing problems
  - CRD considering mandatory septic tank pumping/maintenance

Burgoyne Septage Facility

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- Questions?