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**REPORT TO SALT SPRING ISLAND LIQUID WASTE DISPOSAL LOCAL SERVICE COMMITTEE AND GANGES SEWER LOCAL SERVICE COMMITTEE MEETING OF FRIDAY, 26 JUNE 2008**

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**SUBJECT** **BURGOYNE DEWATERING FACILITY - OPERATIONAL ISSUES AND MITIGATION**

## PURPOSE

To update the Ganges Sewer Local Service committee (Ganges) and the Salt Spring Island Liquid Waste Disposal Local Service committee (SSILW) on operating issues with the Burgoyne liquid waste disposal process and the need to make changes to the facility which may also impact the Ganges sewer local service. To obtain direction from SSILW on whether to proceed with obtaining the approval of the electors for a borrowing to upgrade the Burgoyne facility and by what method the committee would have Capital Regional District (CRD) seek such approval.

## BACKGROUND

The Ganges sewer local service contributes approximately 40% of the total volume of processed material received at the Burgoyne process facility with the remainder generated by on site systems. Increases in volume of septage material received at the site appears to be related, at least in recent times, to a robust real estate market and other perhaps additional promotion of septic tank maintenance. The facility operator has been experiencing increasing difficulty in maintaining production of the facility and has needed to expend considerable overtime to ensure adequate capacity is available for new loads. Staff have begun to analyze all components of the operation to determine why processing capacity appears to be inadequate at this time and are developing a plan to mitigate the problems.

### Overview Of Dewatering Process

All material is trucked to the site, discharged through a manually raked bar screen to a settling tank to remove grit and finally to a pump station which pumps the material to one of two large vertical storage tanks. On press day, material is pumped from these tanks to the press by a separate variable speed solids handling pump. Polymer needed for the pressing operation is mixed manually in a tank using water from the treated effluent produced by the process. Polymer is added by separate pump to the solids stream as it enters the rotary press. Solids material from the press is discharged by gravity to a conveyor system where it is transported to a ground level pad ready for loading to a disposal bin or to the proposed compost system. The liquid pressed from the waste (the pressate) is pumped to a second set of storage tanks. The pressate is fed by pump from these tanks to the membrane bioreactor (MBR) for further treatment. The treatment process, not unlike at the Ganges plant, produces a high quality of effluent on a continuous basis which is again pumped to storage in a third set of tanks. This material is then fed at a constant rate to the disposal bed, with portions reused in the polymer mix process.

### Observations / Issues

Volume of septage / sludge received at the site, 01 January to 31 May, 2007 amounted to 336,357 Imp. gallons.
Volume of septage / sludge received at the site, 01 January to 31 May, 2008 amounted to 387,593 Imp. gallons.
Increase in total product through the system 51,236 Imp gallons.

Interruptions leading to inadequate production this year have included:

- Plugged raw sludge feed lines (typically by sand which has bypassed the grit settlement tank).
- Variations in raw sludge consistency (inadequate mixing in the raw sludge tanks or septage to sludge ratio has been altered).
- Incompatible material (grease loads tend not to mix, especially at lower temperatures).
- Failure in one or more critical components press, polymer feed system, raw sludge feed system(no or very limited redundancy).
- Storage volume / capacity exceeded. With long press runs, pressate storage can be exceeded as MBR plant capacity is too limited, or final product storage tanks are full as disposal field is of inadequate size.
- Press capacity inadequate or component failure in press.

Operator issues identified this year included:

- Bar screen needs to be hand raked, labour intensive, dirty job.
- No provision for screenings wash or disposal.
- Grit chamber settles out organic material as well as sand and grit, once full, grit enters system, has settled in raw tank, raw pump station, raw feed lines.
- Polymer is mixed with filtrate, filtrate quality an issue to obtain consistent results.
- Grease fouls up the works, much mess, time for cleanup, not compatible with press.
- Filtrate tank is concentrating and stratifying, impacts on MBR and feed water for polymer.
- Raw material varies through press cycle, operation attention required regularly.
- MBR cleanup from boil over.

## Objectives for Immediate and Longer Term Plan

Resolve present production issues.
Improve independent operations to reduce need for operator input.
Provide sufficient operator time to also carry out pilot compost project.

Implement capital upgrade program, program design to consider:
- revisions to individual processes to stabilize operation and relieve operator from continuous monitoring
- increase in process capacity to meet projected future increases in material
- revisions to support full scale composting facility
- requirements for reduced down time through increased redundancy in components or processes
- enhanced operation, less intrusive on neighbours, focus on mitigation of fugitive emissions
- removal and side processing of grease and screenings materials arriving from wastewater systems

## Process Upgrade – Requirements by Component or Process

There are a number of areas of the operation which need significant upgrade or replacement. An order of magnitude cost estimate is provided for information only. The cost estimates should be sufficient to determine a funding strategy for the project. The upgrade works include:

1. Headworks
    - The proper removal and subsequent washing of sand and grit is required to maintain flows to the press. Presently grit fouling of the tanks, the lines and the press result in wear and tear and blockage which is a huge loss of production time.
    - Installation of finer screen with screenings wash and collection will remove plastics and trash ahead of the compost process resulting in less contamination and more acceptance of the final product.
    - New flow meter, present unit does not tabulate total flows accurately.
    - Housing for equipment, contained for odour control, overhead structure for operator

discharge.
- Separate grease storage and treatment system.
- Cost allowance, $250,000.

2. Raw Tanks
   - Clean out tanks of all sand and grit.
   - Installation of mixing into each of the two raw storage tanks to provide consistent product to press with less operator intervention required.
   - Upgrade, secure stairway for safe access.
   - Cost allowance, $110,000.
3. Sludge feed system
   - Replace feed pump with higher capacity unit.
   - Provide redundant pump.
   - Relocate system to new building adjacent to compost area.
   - Cost allowance, $60,000.
4. Polymer Feed system
   - Replace solids mix process with premixed liquid feed system.
   - Provide redundancy in feed system.
   - Feed system with final water.
   - Relocate system to new building adjacent to compost area.
   - Cost Allowance, $45,000.
5. Press
   - Upgrade present press wheel, purchase second wheel or rebuild existing wheel, purchase second wheel same as existing.
   - Possible move to alternate technology.
   - Relocate press to new building adjacent to compost area.
   - Upgrade electrical service and controls.
   - Provide odour abatement.
   - Cost Allowance $260,000.
6. Filtrate Storage tanks
   - Clean out tanks.
   - Provide mixing for tanks.
   - Cost Allowance, $85,000.
7. MBR
   - Replace MBR tank with larger volume unit.
   - Replace membranes with gravity higher capacity Kubota plates.
   - Cost allowance, $150,000.
8. Final storage tanks
   - Provide secure access, reduce volume, provide open tank to house Kubota plate membranes.
   - Cost allowance, $10,000.
9. Disposal Field
   - Increase capacity of disposal field, register MBR and disposal field under the Municipal Sewage Regulations.
   - Cost allowance, $60,000.
10. Pilot Compost Facility
    - Complete mixing shed construction.
    - Install compost monitoring and control equipment, air supply system.
    - Initiate pilot compost program operation.
    - Commence monitoring of product, initiate market evaluation, initiate amendment supply study.
    - Cost allowance, funded.

11. Full Scale Compost Facility
    - Building to house remaining compost components, bins, storage, mixing.
    - Provide extended odour control.
    - Cost Allowance $300,000.
12. Engineering
    - Cost Allowance $100,000.
13. Refinance existing short term debt
    - Cost Allowance $136,500.

## Project Phasing

It would be proposed to obtain the assent of the electors to borrow the necessary funds for the entire project, but to phase the works and the borrowing. The initial phase will reconstruct the present dewatering facility and the second phase would construct the full scale composting facility. The timing of the latter phase would follow a successful pilot compost project. Should the pilot not prove successful, the second phase of the project would be delayed or not constructed.

## Costs / Funding

A completed conceptual design continues to evolve, however preliminary order of magnitude costs suggest the upgrade of the existing facility will be in the order of $1,130,000. It would be prudent to retire the existing five-year borrowing at a further cost of $136,500.

The second phase costs for the structure and bins for the full scale compost facility is estimated to add a further $300,000.

Assuming the funds are borrowed on a phased approach as suggested, the annual borrowing costs for phase 1 including short term debt requirement would amount to approximately $133,000 in 2009, rising to $163,000 in 2010 with the second borrowing. To maintain the present requisition (parcel tax) at current levels, the present debt payments of $94,000 would need to be augmented from the operating budget by $39,000 in 2009 and by approximately $60,000 in 2010. The 2007 operating budget contains a contingency of some $48,000 which should be available to cover additional borrowing in 2009, however it would be necessary to raise a further $10,000 to $12,000 in 2010 through either reduced operating costs, or an increase in the user fee or both. As an example, a user fee increase of $0.015/gallon for both septage and sewage sludge would generate approximately $13,000.

## Approvals

The CRD would need to obtain the assent of the electors of Salt Spring Island to proceed with funding the project. The two likely means to obtain elector approval would be either alternate approval or a referendum. In both cases the CRD would need to give three readings to the necessary bylaws to initiate the process. If a referendum is proposed for November, in concert with the municipal election, bylaws would need to be passed in August or September providing limited time to ensure cost estimates are accurate.

## SUMMARY

CRD staff have documented a number of operational issues at the Burgoyne dewatering facility which need to be resolved in a more timely fashion than can be accomplished on the year to year funding basis as is now practiced. A list of proposed works and budget costs have been prepared for the information of the committees. The extent of the works will require funding through a long term borrowing. It is likely that the borrowing costs can be accommodated in the budget without the need to increase the parcel tax, however an increase in the user fee in the $0.015 to $0.020 per gallon range might be necessary in year two of the program. Committee will be asked to direct staff in the timing and method of gaining the approval of the electorate.

**RECOMMENDATION**

That the Salt Spring Island Liquid Waste Disposal Local Service committee:

1. accept this report for information;
2. direct staff on the timing and method to obtain the approval of the electorate; and
3. direct staff to bring back a report with the proposed bylaws and final costs of the project for consideration.

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