

CITY OF BURNABY

ENVIRONMENT AND WASTE MANAGEMENT COMMITTEE

HIS WORSHIP, THE MAYOR  
AND COUNCILLORS

Re: Wastewater Treatment Pilot Project

**RECOMMENDATIONS**

1. THAT staff be authorized to develop the terms and funding requirements for a joint pilot program with BCIT based on the SAS wastewater treatment technology.
2. THAT upon confirmation of the feasibility of the joint program, a further report be submitted to Council for budget consideration and approval.
3. THAT a copy of this report be forwarded to Mr. Mark Angelo, BCIT for information.

**REPORT**

At its meeting of 1996 March 12 the Environment and Waste Management Committee adopted the attached report advising on the feasibility of establishing a wastewater treatment pilot project. The Committee recommends that Burnaby work with BCIT to develop details of a joint pilot program utilizing a non-chemical, ecosystem based technology.

Respectfully submitted,

Councillor D.P. Drummond  
Chair

Councillor D. Johnston  
Member

Councillor D.A. Lawson  
Member

**COPY - CITY MANAGER  
- DIRECTOR ENGINEERING  
- DIRECTOR PLANNING & BUILDING  
- CHIEF ENVIRONMENTAL HEALTH OFFICER**

**TO:** CHAIRPERSON & MEMBERS  
ENVIRONMENT & WASTE  
MANAGEMENT COMMITTEE

**DATE:** 1996 03 05

**FROM:** DIRECTOR ENGINEERING

**FILE:** 41-04-01

**SUBJECT:** WASTEWATER TREATMENT PILOT PROJECT

**PURPOSE:** To advise the Committee and Council of the feasibility of establishing a wastewater treatment pilot project and to recommend a possible course of action.

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**RECOMMENDATION:**

1. THAT the Environment & Waste Management Committee recommend to Council that:
  - a. staff be authorized to develop the terms and funding requirement for a joint pilot program with BCIT based on the SAS wastewater treatment technology;
  - b. upon confirmation of the feasibility of the joint program, a further report be submitted to Council for budget consideration and approval;
  - c. a copy of this report be forwarded to Mr. Mark Angelo, BCIT for information.

**REPORT**

**1.0 INTRODUCTION**

At the October 1995 Environment and Waste Management Committee meeting, staff were requested to report on the feasibility of establishing a City wastewater treatment pilot project utilizing a wetland and ecosystem based technology.

In the last few months, staff have contacted several communities in Canada and the U.S. that have experience in a green house process trademarked as Solar Aquatics Systems (SAS) for sewage treatment. To investigate the feasibility of a local pilot project, staff have also met with Eco-Tek, the local company representative for SAS to discuss the concept and implementation cost of the proposal.

This report is to present the findings of our initial review and assessment of the SAS technology and to recommend a possible course of action for consideration by the Committee and Council.

## **2.0 EXISTING GVRD SEWAGE TREATMENT**

Under the Regional Liquid Waster Management Plan, Burnaby is responsible for the collection and conveyance of wastewater generated within the City and, the GVRD is responsible for the final conveyance, treatment and disposal of sewage from its 18 member municipalities. Burnaby's wastewater is treated at the GVRD's Annacis and Iona facilities both of which have primary treatment process only.

Under the Province's mandated program, the Annacis facility is undergoing a secondary treatment upgrading process and when complete, will provide an enhanced effluent quality prior to discharge to the Fraser River.

## **3.0 ALTERNATE ECOSYSTEM BASED TREATMENT TECHNOLOGY**

### **3.1 Background**

As the Committee may recall, a presentation on the SAS technology was made to the Committee by a local company Eco-Tek in 1995. The technology basically utilizes a combination of ecological and microbiological processes, and it is gaining acceptance in Canada and the U.S. Following the references provided by the company, staff have contacted several communities by telephone to obtain information on the operation and performance of the system. Results of the preliminary evaluation are presented in this report.

One of the key unique features that set the SAS technology apart from the conventional wastewater treatment is that it does not use chemicals to treat the wastewater and the process also produces less sewage sludge. The backbone of the system consists of a network of tanks along with artificial channels and marshes filled with aquatic and nonaquatic plants and organisms. The system is hosted in a greenhouse where the wastewater is treated and discharged. An article published by the technology developer referenced that one of the pilot plants reviewed by the Massachusetts Department of Environmental Protection in 1992 was found to produce an effluent that consistently met Class I drinking water standards.

Several SAS treatment plants have been installed in communities in Canada and the U.S. for pilot, research and commercial purposes. These plants are of small size operations ranging from 2,000 gallons/day to 150,000 gallons/day capacities. Staff have contacted the designers and operators of the SAS plants in Bear River and Beaverbank Villa, Nova Scotia, and Marion, Massachusetts. Results of the telephone interviews indicated positive experience on the performance and operation of the system. The plants in Bear River and Beaverbank Villa are for domestic sewage only to replace the failing septic systems while the plant in Marion is used primarily as a pre-treatment facility with the effluent discharged to the Town's sewage lagoon prior to final discharge to the receiving water.

## **3.2 Possible Pilot Program**

### **3.2.1 Environmental Initiative**

Based on the literature review and discussions with system operators, staff are of the opinion that the SAS technology provides an environmentally sensitive and cost effective solution for small communities where conventional treatment facility is economically not viable or where the less expensive septic system is technically not feasible due to local environmental concerns and poor soil conditions. Although the treatment of Burnaby's wastewater is a regional function, recent development in alternate sewage treatment offers Burnaby the opportunity to support further research and development of the evolving technology that may have broad and significant environmental benefit.

The support of research in environmentally sensitive solution in wastewater treatment is also one of the key issues identified under the Burnaby's State of the Environment Report.

### **3.2.2 Burnaby Pilot Program**

To investigate the feasibility of establishing a pilot project in Burnaby, staff have met with Eco-Tek and received a preliminary proposal for a pilot plant on City owned land that would serve approximately 50 residential homes with an average daily flow of approximately 10,000 gallon/day capacity. The cost of the temporary system for pilot study purposes is estimated at approximately \$150,000 plus \$10,000 annual operating cost. The capital cost does not include the costs of land and the sewer collection system required to convey the wastewater to the treatment site. The 10,000 gallon/day capacity was suggested by the proponent as the optimum size for a pilot plant. Notwithstanding the Provincial and Federal grants that may be available for the pilot project, financial commitment required from the City would be significant.

### **3.2.3 Possible City/BCIT Partnership**

During our evaluation, it was learned that BCIT is considering a small scale research project on campus utilizing the SAS technology. The project would be undertaken under the laboratory environment by students and hence would be much more cost-effective than the larger scale City pilot program. The City has enjoyed excellent partnership with BCIT on several environmental projects, and the shared interest of both the City and BCIT on the alternate wastewater treatment technology provides another opportunity for possible partnership.

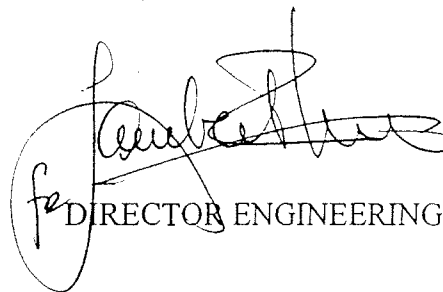
Therefore, it is recommended that the City work with BCIT to develop the terms of the joint pilot program employing the SAS technology. Staff will report back to the Committee and Council once the program details and the financial requirement from the City have been determined.

**4.0 CONCLUSIONS**

Liquid waste management is one of the many environmental challenges facing the City that will require innovative and environmentally sensitive solutions. Recent development in wastewater treatment has shown that a non-chemical, ecosystem based technology is a viable alternative and would offer significant environmental benefits.

Given the Solar Aquatics System is an emerging technology that still in its infancy, further evaluation and monitoring would be necessary in order to confirm its potential application and performance. With the recent interest expressed by BCIT to pursue an experimental project on campus using the SAS technology, it is recommended that the City develop a joint partnership program with BCIT for the project. As a part of the joint program, staff will also pursue possible financial assistance from the Senior Governments and the Regional District.

Subject to the approval of the Committee and Council, staff will work with BCIT to develop the details of the possible partnership program, estimated cost and terms of the project. Upon the confirmation of the feasibility of the pilot project, a staff report will be submitted to the Committee on the detail of the program and budget requirement for final approval.



DIRECTOR ENGINEERING

LSC:ma

cc: City Manager  
Director Planning & Building  
Chief Environmental Health Officer

