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Halifax, Nova Scotia  
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## Item No. 11.1.2

Halifax Regional Council  
December 4, 2007

**TO:** Mayor Kelly and Members of Halifax Regional Council

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**SUBMITTED BY:**

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Dan English, Chief Administrative Officer

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Wayne Anstey, Deputy Chief Administrative Officer - Operations

**DATE:** December 4, 2007

**SUBJECT:** Sewage Thermal Recovery, Techno-Economic Study Award

### ORIGIN

- HRM Council approval of Alderney 5 Energy Project, August 7, 2007
- September 28, 2007 staff briefing to Energy and Underground Services Committee

### RECOMMENDATION

It is recommended that HRM Council:

1. Authorize an addition of \$33,100 to the 2007/8 Approved Operating Budget.
2. Authorize a non-repayable withdrawal from the Strategic Growth Reserve (Q126) in the amount of \$33,100 to fund a portion of the Sewage Thermal Recovery, Techno-Economic Study under Operating account I101 - 6999 as outlined in the Budget Implications section of this report.
3. Authorize the sole-source expenditure of \$93,100 including net HST on a techno-economic study of Sewage Thermal Recovery to High Performance Energy Systems as per the Budget Implications section of this report.

## **BACKGROUND**

The Alderney 5 Energy Project on HRM property has sparked a lot of interest in the “green” energy technology being used. During most discussions about the project, outside stakeholders have always asked can this system be expanded? The answer is yes - but within limits. Estimates are that after 2-3 years the system will have 20-40% extra renewable cooling capacity to serve other properties. The Alderney footprint is approximately 330,000 ft<sup>2</sup> in area, so the excess capacity could serve an additional 130,000 ft<sup>2</sup>.

### **Queen’s Square**

From the start, the Alderney 5 project has been a collaboration with High Performance Energy Systems (HPES) and Environment Canada. Environment Canada has expressed an interest in extending the utilization of the technology to the building they lease across the street from Alderney Gate (Queen’s Square). The current contract with HPES takes into account any potential revenue from excess cooling capacity in the event that HPES enters into a cooling commitment with Queen’s Square.

### **Dartmouth Sewage Treatment Plant**

HPES has proposed a concept to heat and cool buildings with “green” thermal energy for Dartmouth waterfront properties. Renewable energy would be supplied by two types of technology - cold energy from the Alderney site and hot energy from sewage waste heat recovery. These would require access to municipal infrastructure to enable the project. HPES has already performed a small demonstration project in Halifax recovering heat from sewage in Jacob’s Manor (a 30 unit residential project). The new Olympic Village in Vancouver is also using a form of sewage heat recovery.

Preliminary estimates are that there is between 90-120 MW of useful heat that could be extracted from treated sewage prior to being discharged into the harbour. By lowering the temperature of treated effluent there could be further positive environmental attributes to the concept.

### **Dartmouth Waterfront Developments**

There is a significant amount of development planned for the Dartmouth waterfront over the next 2-5 years. Much of this development is in the vicinity of the Alderney complex and the Dartmouth Sewage Treatment Plant. The availability of heating and cooling produced offsite would significantly reduce building costs for these new developments. Access to renewable energy would also have the potential to reduce long term operating costs, and could be attractive to new and existing properties. The new developments would have the potential to act as a catalyst for the concept of sewage thermal recovery.

## **DISCUSSION**

To evaluate the feasibility of providing green thermal energy from the Dartmouth STP a techno-feasibility study is required. The study would determine capital costs, risks, and potential operating revenue with (1) the extended cooling capacity from the Alderney project and/ or (2) utilization of waste heat from the sewage treatment plant in Dartmouth.

Staff's initial assessment of the feasibility of such a project is that the technical feasibility should not pose any difficulties as the concept is broadly used and accepted and does not require innovative, or leading edge technology for project success. With respect to financial feasibility, it is anticipated to be very strong, largely because of the lack of cost for fuel, which fuel costs tend to approximate half or more of the input costs of energy.

From the perspective of potential customers, because of the lack of requirement for fuel inputs, the advantage of a renewable energy source for heating purposes is that it stabilizes future heating costs by uncoupling those costs from the energy fuel markets. Renewable energy sources help meet community climate change and air quality objectives, demonstrate corporate citizenship and allow owners to differentiate offerings in the office lease market. Therefore there is a very significant benefit to property owners if financially viable renewable energy sources can be secured.

From the municipality's perspective, the development of renewable energy sources provides economic strength to the community by creating a diversity of energy supply, by creating a self-sustainable energy supply, and by creating a predictable/reasonable cost of energy. Furthermore, HRM is committed to ensuring improvements in air quality and a reduction in GHG emissions, all of which is consistent with our 20% GHG reduction commitment. Similarly, if heat recovery from the Dartmouth STP's effluent goes ahead, there could be incremental revenue opportunities which would enable other projects.

What we have learned as the CEP continues to evolve is that the cost of energy to the HRM community has increased by 40% over the last 5 years and it is clearly in the interest of the community that there be a broader opportunity for business owners and residents to access more reasonable cost, and environmentally friendly energy.

At the same time, staff believe that if there is an opportunity to moderate the environmental impact of the contribution of waste heat to the ocean from the effluent of the Dartmouth STP, HRM should take advantage of the opportunity to do so.

With a modest (or less modest) system expansion to HRM's Alderney 5 project, HRM would be able to maximize the utilization of the infrastructure now under construction and recoup its \$2.6 million investment in the \$3.6 million project more quickly. Capital costs for cooling expansion are incremental in comparison to the current project. On the other hand, HRM might also choose not to allow expansion due to increased responsibility/operating complexity.

Although there was some discussion at the EUGS Committee regarding the need to undertake a similar study in respect of both the Halifax and Herring Cove STP's, staff believe that there will undoubtedly be much learned from the present proposal, and therefore are suggesting that a study in respect of the Halifax and Herring Cove STP's await receipt of the report on the Dartmouth STP. Any future studies for heat recovery at the Halifax and Herring Cove STP's will be procured through a competitive process.

It is proposed that the Dartmouth study be undertaken by High Performance Energy Systems. Staff are recommending this sole-source award to HPES because of its knowledge of the Alderney 5 project, its local experience in waste heat recovery systems, and its current knowledge of the

potential anchor tenant's project. Additionally, there is a timing imperative to ascertain the feasibility of the potential for using this source of green-thermal energy source before the potential anchor tenant's project advances much further, or the opportunity may be lost. Staff also believe that the proposed cost is well within usual costs for this type of work and anticipate full recovery of these costs through future contracts and so it should ultimately be a flow through cost. In addition, staff believe that it is in the Municipality's interest to move forward with this study quickly

**BUDGET IMPLICATIONS**

Staff is proposing engaging in a techno-economic study of the Sewage Thermal Recovery to the High Performance Energy System in the amount of \$93,000 including net HST, with funding coming from the Strategic Growth Reserve (Q126) \$33,100 in the form of a non-repayable withdrawal, and \$60,000 in funding from Operating Account I101-6999. This will result in an increase to the overall 2007/8 Approved Operating Budget. The budget availability has been confirmed by Financial Services.

The \$60,000 of funding available from the Operating Budget is a result of the upholding of the Solid Waste Exportation By-Law. \$60,000 had been budgeted as funding for strategic initiatives under the EMS Director's Office, to cover the contingent legal costs that would have resulted from defense of the Solid Waste Exportation By-Law. The un-used portion of the EMS Director's Office budget has become the IAM Director's Office budget, and the main strategic initiative identified to utilize these funds, is the Sewage Thermal Recovery Study.

Budget Summary:

**Operating Account I101-6999, Administration**

Cumulative unspent balance	\$ 74,021
<b>Transfer from Strategic Growth Q126</b>	<b><u>\$ 33,100</u></b>
Total	<b><u>\$107,121</u></b>
Award	<u>\$ 93,100*</u>
Balance of Account	\$ 14,021

\*This project is new and was not included in the 2007/8 Approved Operating Budget. The remaining funds will be available for any unforeseen additional expenses.

**FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN**

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating reserves, as well as any relevant legislation. If approved this will increase the 07/08 Operating budget and Reserve withdrawals.

## ALTERNATIVES

1. HRM Council could choose not to award the techno-economic study to HPES and issue a Request for Proposals (RFP) or Request for Expression of Interest (EOI) to gauge the interest of other private partners in utilizing HRM infrastructure as proposed. HRM is contractually obligated to partner with HPES for any expansion of the cooling component of the Alderney project. Also this option is not recommended because it may result in the study not being completed in time for sewage thermal recovery to be considered as the heat source for any new Dartmouth developments on the near horizon.

2. HRM Council could choose not to fund the techno-economic study and decline to participate in the venture. This would forego any revenue opportunity from either the Alderney site or Dartmouth STP infrastructure. This option is not recommended.

## ATTACHMENTS

None

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/cagenda.html> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

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