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**CITY OF IQALUIT - DEPARTMENT OF PUBLIC WORKS**

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**DATE:** APRIL 19, 2005  
**TO:** JEFFERY WHITE  
**CC:** JOHN KEYUK, IAN FREMANTLE, MAYOR AND COUNCIL, BRAD SOKACH  
**FROM:** MARK HALL  
**RE:** SNOWFLUENT QUESTIONS

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Thank you for your presentation at our Public Works Committee of the Whole meeting of April 18, 2005.

As you may be aware the City Council is requesting additional clarification on several issues regarding the Snowfluent presentation/proposal. Due to personality conflicts I will be handling communications between Northern Watertek/Insight Management Group and the City.

City Council is hoping to provide definitive direction to staff during our Council Meeting of April 26, 2005. This direction will be in part based on clarification to the following issues. Additional requests are likely to be made to yourself later this week, however due to the very tight timelines we are providing a preliminary list of questions in this memo.

To allow for translation of this document and your responses we request that you attempt to provide a reply before noon April 22, 2005. If you cannot meet this time please let us know.

1. The final location of the snowmaking grounds would be decided based on input from the local population with the final decision to be made by Council. Can you please provide a minimum the following:
  - a. A minimum of three potential locations which you would propose to be considered for the manufacture and storage of the snowfluent.
  - b. In addition an indication of the infrastructure required to pump the sewage to these locations including but not necessarily limited to piping and sewage lift stations.
2. Can you please provide a detailed cost breakdown of the 6.7 million quote previously provided to the City along with any modifications to the quote based on your visit to Iqaluit. We will provide a copy of the draft Municipal Guidelines for your review to aid in providing the detail by the City regarding some components of your design (such as the frequency and general detail of access vaults).
3. The City administration understands that a lagoon is required to settle solids as well as store sewage over the summer when the temperature is not low enough to allow the manufacture of snow. The City's current lagoon has a capacity of approximately 20,000 cubic meters which will hold 10 to 14 days worth of sewage. Obviously this will not be of adequate size for summer storage. We would estimate that the minimum lagoon size

would need to accommodate the volume from approximately 5 months of sewage generation. Standard practice in the Arctic for engineering design is to assume that each person in the City generates approximately 400 litres of sewage per day. With the current population of approximately 6,500 people this equates to a five month storage requirement of 390,000 cubic meters. This is approximately twenty times the volume of our current lagoon. We understand from your presentation that you would propose to expand the existing lagoon in it's current location along with modifying the operation of the lagoon which may reduce the final required capacity of the lagoon. Can you please provide the following:

- a. The means to expand the lagoon capacity (ie. would it be higher, wider, longer, deeper) and the method to achieve this (ie. blasting, earth berms, bentonite or other geotextile, or some sort of tank walls).
  - b. The operational changes which would be made to the lagoon to reduce or eliminate odors which currently emanate from it.
  - c. The expandability of the new lagoon to meet the storage needs for a population of 12,000 people (this is the 20 year population estimate which all projects under our Capital Plan are designed to).
  - d. The estimated cost to complete the expansion of the lagoon to address the current design sewage flows for a population of 6,500 as well as the cost for additional expansion to meet the requirements of a population of 12,000.
4. Northern Watertek has provided a quote and a guarantee of operation for the Snowfluent system. This is encouraging to council. We have the following questions:
  - a. What are the terms of the guarantee.
  - b. If the snowfluent system is not successful will Northern Watertek reimburse the City for all expenses incurred for this project including but not limited to: engineering fees, infrastructure costs (piping, lift stations, lagoon upgrades), snowfluent equipment capital costs, the operation and maintenance costs for the period which the snowfluent equipment did not operate or provide treatment as provided for under the guarantee. If so, for some or all of these conditions what means would be used for this (bonding, irrevocable letter of credit, etc.).
  - c. Will Northern Watertek indemnify the City from any charges under the Fisheries Act or other statutes and regulations which may occur from the operation of the plant. If so, what financial mechanism is proposed (ie. bonding, irrevocable letter of credit, etc.).
5. During your proposal to Council you indicated that you were confident that despite the need for public consultation and regulatory approvals you could have a system operational within 4-6 months. Can you please provide a timeline for completion of this project including all major tasks.

6. The design of the Northern Watertek system is based on a number of assumptions or on information provided by the City. What steps would you propose to take to confirm assumptions and information provided by the City?
7. Based on the use of 10 to 12 snowmaking towers, what approximate dimensions of the snowfluent snow pile, including any additional natural snow, would be existing at the start of spring and prior to melting.
8. The City has concerns that the snowfluent would not melt over our short summer in sufficient time for plant growth to adequately uptake nutrients prior to migration of the effluent off site. Can you please provide either commentary or calculations to provide the City with a level of comfort that this snow will completely melt well before the end of our summer.
9. What would be the fate of the sewage granules remaining on the ground surface after completion of the melting of the snow pack?
10. Can you please provide details on the \$350,000 operations and maintenance estimate? Does this include a contribution to a reserve fund for maintenance and upgrades?
11. Can you also provide the name and coordinates of the gentleman, who I believe was with the Ontario MOE who stated that the Earth Tech activated sludge would not work in Iqaluit.
12. Can you provide a discussion of why there were acutely toxic levels of ammonia in the snowfluent snow and effluent in the Inuvik study.
13. Can you please provide a comment on the data included in Slide 9 of your presentation which suggests that engineering fees for a snowfluent system would be approximately 25% of the project cost where with the Earth Tech system the engineering fees are approximately 15% of the project cost.
14. Can we please be provided with references and summaries of previous projects which Mr. Keyuk and/or his company have participated in of a similar size and scope to this project.
15. I have left a couple of messages with Mr. Palmateer who you suggested we contact. These have not been returned. Is it possible for you to contact him directly and have him call Mr. Sokach of the City. I believe the other reference provided was a Mr. Huber. We have misplaced his contact information and request it be provided.

Regards,

Mark Hall  
Director of Public Works  
City of Iqaluit

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