The Thompson Rosemount Group Inc.
1345 Rosemount Avenue
Cornwall, ON, Canada K6J 3E5
Telephone: 613-933-5602
Fax: 613-936-0335
Internet: mail@trg.ca Website: www.trg.ca

Ministry of the Environment
Technical Support Section
Unit 3 – 1259 Gardiners Rd.
P.O. Box 22032
Kingston ON K7M8S5

April 25, 2010

Attn: Ms. Vicki Mitchell, Environmental Assessment Coordinator

Re: Town of Hawkesbury Wastewater Treatment Plant (WWTP)
WWTP Upgrades and Design Changes to ESR - Revised

Dear Ms. Mitchell:

The Town of Hawkesbury has retained The Thompson Rosemount Group Inc. (TRG) to design the upgrades at the Hawkesbury WWTP based on the recommendations of the Environmental Study Report for the WWTP. Accordingly, we have updated the historical profile of the quantity and quality of raw sewage at the plant and revisited the operations of the facility. We have also updated the cost analysis information for the planned upgrades to determine the available budget for each of the planned treatment components. Based on this review and further evaluation with the Town and the value engineering team we have determined that there will be some modifications to the ESR recommendations required to deliver a quality product while reducing the impacts on social, economic and environmental parameters of the facility and surrounding area.

The recommendations of the ESR (2008) were:

The preferred design for the upgrades to the Hawkesbury WPCP includes:

- *Modifications to the Raw Sewage Pumping Station to Transfer design peak flows to the upgraded plant.*
- *New Headworks requiring screening, grit and grease removal will be constructed.*
- *The existing aerobic digesters will be modified to primary clarifiers.*
- *The retrofit of the existing stormwater equalization tanks to aeration tanks will be required to meet the design criteria.*
- *Incorporation of the chem/phys tank from the stormwater system as a secondary clarifier.*
- *Modifications to the chlorine contact chamber to accommodate ultraviolet lights.*
- *Modifications to the effluent pumping station.*
- *Construction of an autothermal thermophilic aerobic digester (ATAD) and storage, nitrification, denitrification reactor for sludge stabilization.*
- *Construction of a dewatering facility and storage facility, providing 240 days minimum storage, for the biosolids.*

Stress testing of the secondary clarifiers should be completed prior to the detailed design stage to ensure that the side water depth of 3.0m does not compromise the clarifiers based on the proposed design criteria.

Based on the evaluation, there are two components of the recommendations that will be modified 1)

the equalization tank retrofit and 2) construction of 240 days of on-site biosolids storage. These two items and the subsequent impacts on the system are discussed below.

Existing Equalization Tanks

The existing stormwater equalization tanks will not be converted to aeration tanks due to the necessity of maintaining this equalization volume for storm flow attenuation. The equalization tank function will be maintained as is; however, due to the increased capacity of the secondary treatment process (24,500 to 41,400 m^3/d), as identified in the ESR, there will be much less frequency of by-passing to the equalization tanks.

The two (2) wet weather equalization tanks will be retained in the upgrades. The equalization tanks will provide attenuation of the instantaneous flows in excess of the raw sewage pumping station capacity (41,400 m^3/d). Each tank has surface area dimensions of 24.91m by 7.35m and a side water depth of 4.2m, for a total equalization volume of 1,540 m^3. As part of the upgrades, the equalization tanks will discharge back through the new headworks and secondary treatment process according to the available capacity in the secondary train (i.e. raw sewage pump rate + equalization pump discharge rate = peak flow capacity of the secondary train (41,400 m^3/d)).

The impacts of this item on the social and natural environments will be such that the Ottawa River water quality will be further protected by further reducing the frequency and quantity of raw sewage bypasses as a result of increasing the total design capacity of the plant and maintaining the existing equalization tanks. In addition, by increasing the secondary plant's MDF design capacity to 3 ADF from 2 ADF, the combined effluent quality during storm event's will be improved. As well, any impacts on the use and quality of the river for downstream users will be negated accordingly. These are positive changes in the overall direction of the upgrades in that the overall impacts will be to lessen the water quality impacts on the Ottawa River.

The impacts on the economic environment have been the major focus of our current evaluation. TRG has been evaluating the methods with which to address the biological process capacity short-fall as a result of removing the equalization tank volumes from the process. This has been addressed through two methods: 1) building additional aeration tanks or, 2) modifying the existing tanks from an upgraded aeration process while maintaining the existing budget. Construction of additional aeration tanks (one additional aeration basin similarly sized to the existing three (3) aeration tanks) would result in increasing the footprint of the recommended upgrades (at the site) in order to maintain an effective secondary treatment process. Option 2) would modify the aeration process using the existing tanks. The modification would include a subtle conversion of the activated sludge process to an integrated fixed film activated sludge (IFAS) process, essentially partitioning the aeration tanks and increasing the available biomass in the aeration tanks. The cost evaluation of these two scenarios indicated that the IFAS system was the least cost option that could be implemented within the existing budget of the preferred solution. However, there is still a risk in this approach as part of the budget for the modification will result in using the construction contingency budget for physical works which creates a risk of constructing the project over-budget. This risk will be managed within the framework of the design and tendering process. However, should the general contract tender pricing (i.e. construction pricing) not allow, feasibly, for the modification of the existing aeration tanks with the IFAS process, the plant will still operate as a CAS process. According to the modeling results prepared by Hydromantis Inc., conversion from the EA process to the CAS with only the existing tankage (including the chemical/physical wet weather tank as a secondary clarifier) will allow the plant to meet the effluent criteria identified in the ESR. The

intent with the additional aeration basins was to provide nitrification on a year round basis which, cannot be achieved with only the CAS conversion. It remains the Town's preference to provide full nitrification, budget permitting.

Thus, there has been no overall social, natural or economic impact as a result of this design modification. In fact, the IFAS solution provides superior treatment within the same footprint with the ability to sustain the biological process during instantaneous peak flows (an overall more stable process).

On-site Biosolids Storage

It was recommended in the ESR to construct 240-days of biosolids storage at the WWTP facility. This option has been further reviewed with the management and operations staff as well as compared to their existing biosolids management system and it was determined that the storage of dewatered biosolids at the plant potentially could result in negative environmental impacts that cannot adequately be addressed at the downtown location of the plant. The biosolids management plan has been reviewed by the design team and discussed during the preliminary design value engineering session. It has been the preference of the Town's operations staff to provide dewatering capacity with full redundancy as well as to produce the highest quality of biosolid product as is possible. The intent of this decision is to provide the operations group with as much flexibility in the future as is possible. It has therefore been determined to provide all of the sludge digestion and treatment infrastructure recommended in the ESR, including autothermal thermophilic aerobic digestion (ATAD), a storage, nitrification/denitrification reactor (SNDR) as well as biosolids dewatering and odour control facilities. This solids treatment process will be developed to discharge directly into transport containers that will either be transported directly to land approved for biosolids application or to the Mayer Landfill, which are the current biosolids disposal locations. In the future the Town will be evaluating suitable, "out-of-town" locations as off-site temporary storage facilities to store the treated biosolids during the period when farm land is unavailable.

This change will result in an improvement to the social, natural and economic impacts both on-site and in the surrounding environments. The social impacts are reduced by removing a potential odour and aesthetic problem (due to the physical location of the facility). The natural impacts are essentially "status quo", the landfill will use the biosolid product as a daily cover in lieu of excavated/transported earthen fill and the farm land will be used when available. The economic impact will be minimized since the cost of constructing on-site storage will no longer be required. It is also important to note that legislative changes to the Nutrient Management Act which occurred following completion of the ESR no longer requires a minimum of 240 days biosolids storage.

Conclusions

The ESR recommended converting the existing equalization tanks into aeration tanks to account for the increasing aeration requirements. During final design is was concluded that this would have resulted in increasing the total number of storm flow by-passes. The current design maintains the existing equalization tanks thereby reducing the frequency and duration of by-passes providing a net reduction in the overall environmental impacts as compared to both the current conditions and the ESR recommendation. Furthermore, the IFAS solution reuses the existing aeration capacity, upgrading the existing infrastructure and provides for full-nitrification without the need to construct additional tankage, resulting in an overall positive impact.

The ESR recommended providing 240 days of on-site biosolids storage which would have created an odour and aesthetic problem in the downtown area. The current design includes a nitrification/denitrification solids reactor and two dewatering units, which provide full redundancy in the dewatering system, so that the biosolids maybe moved directly off-site for disposal or land application without the need for on-site storage. The result of this change is the elimination of a potential odour and aesthetic problem, reduced capital cost by removing the on-site storage infrastructure and creating a more flexible biosolids management system. This change also results in a net reduction in the overall environmental/social/economic impacts as compared to the ESR recommendation.

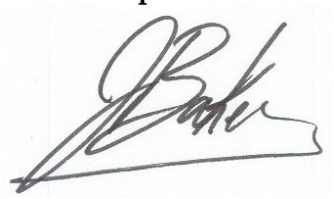
Recommendations

Based on the facts that there is no fundamental change to the preferred solution and the overall environmental, social and economic impacts are positive, there is therefore no requirement to amend the 2008 Environmental Study Report for the Hawkesbury Wastewater Treatment Plant.

Thank you for your consideration of this matter.

Sincerely,

The Thompson Rosemount Group Inc.



Jamie Baker, P.Eng., C.E.T.
Environmental Engineer

X:\2009\09105009\Correspondence\MOE\09105009 Preconsultation Update March 31_2010jbre.Doc