church & trought inc.
environmental and engineering solutions

May 3, 2013

Dennis Tascona
President
Vitajoe Ltd.
1 Trafalgar Drive
RR #2 Shanty Bay, ON
L0L 2L0

REFERENCE: **Air Quality and Noise Assessment**
Vitajoe Ltd.
CTI Project P4561

Dear Mr. Tascona:

Church & Trought Inc. (CTI) was retained by **Vitajoe Ltd.**, to conduct an Air Quality and Noise Assessment for a proposed new residential development at a parcel of land located at 220 Bradford Street, Barrie, Ontario, (Subject Property).

1.0 Background

We understand that a used-car dealership was operated on the subject property for many years. Vitajoe Ltd. is proposing to develop a 13-storey, 100 unit condominium on the site.

The property is located on the west side of Bradford Street, across the road from the City of Barrie's Waste Water Treatment Plant (WwTP). The closest part of the WwTP structure is about 80 m from the easterly property line of the subject property. The WwTP is currently operating at a capacity of about 52,000 cu.m. per day, however a recent expansion brought the rated capacity to 76,000 cu.m. per day. We understand they could also expand the plant in the future to an ultimate maximum capacity of 120,000 cu.m. per day.

2.0 Objective

The objective of the proposed study was to assess the potential impact on the proposed development from the WwTP relative to noise and odours. This included:

- Verification that the separation distance for establishing a sensitive land use in proximity to the City's Wastewater Treatment Plant (WwTP) was adequate in accordance with the Ministry of Environment D2 Guidelines;

- Identification if mitigation measures were in-place and if additional mitigation measures are expected for the development of a sensitive land use on the subject property due to the proximity of the WwTP; and,

- Confirmation that the development of a sensitive land use on the subject site will not impede the operation of the WwTP at present or in the future.

3.0 Scope of the Assessment

To meet the project objectives, the following tasks were performed:

1. CTI obtained and reviewed an air quality and a noise study that have been conducted at the WwTP;

2. Copies of Environmental Compliance Approvals for the WwTP were requested. The approval for the sewage works was reviewed;

3. A site visit was conducted to qualitatively assess noise and odours from the WwTP;

4. The separation distance as per D-2 Guideline was established;

5. The MOE was contacted to determine if there have been any complaints of odours/noise in the area;

6. A review of the number and location of current residences in the area was undertaken. This information was compared to the number of new residences that are anticipated and the potential impact on the new residences in comparison to the impact on the current residences; and

7. An opinion was provided regarding potential adverse effects on the subject property and therefore the likelihood of obtaining City approval for the development.

4.0 Air and Noise Reports

CTI requested the most recent reports which assessed odour and noise. The reports that were received and reviewed were:

- *City of Barrie, Water Pollution Control Centre, Odour Control Study, by CH2MHILL, January 2006;* and

- *City of Barrie, Water Pollution Control Centre, Acoustic Assessment Report, by Cole Engineering, April 2012.*

a) Odour Control Study

The purpose of the study was to determine the preferred strategy or strategies to mitigate off-site odour impacts at the Barrie WwTP. The odourous areas targeted for assessment in the study included the future blending tank, the biosolids loading facility, and the sludge thickening building.

The study included a qualitative assessment of potential odour sources, and based on that assessment conducted odour sampling and dispersion modelling on those sources that were deemed to be the most significant. The sources include the Influent Works, WAS Thickening Building, Biosolids Loading Facility and Blending Tank.

The results of the odour sampling and modelling showed that the odour emissions from the thickening building and the sludge loading operation were the most significant source of odour and that odour concentrations calculated at the fence line exceeded the MOE target concentration of 1 ou/m3.

A number of potential control strategies were assessed with the final recommendations being:

- Sludge Thickening Building – Operational changes by chlorinating stagnant;
- Biosolids Loading and Blending Tank – Control using Biofilter.

Since the issuance of the report we received an e-mail from the City that confirms the odour control that has been put in place as a result of the study:

"To address odour concerns that had been identified in 2006, the WWPC Odour Control report provided the following recommendations:

1. *A biological odour control system was installed to treat odours from the blending tanks and truck loading area. (Note that the vertical unit was actually installed to conserve footprint)*

2. *A carbon adsorption system was installed on the septage receiving station.*

3. *Odours from WAS thickening process are not detectable outside the WAS thickening building.*

The recommendations were implemented in two separate projects:

1. *WwTP – Expansion to 76MLD; and*

2. *Septage, Supernatant and Bioaugmentation Receiving Station"*

b) Noise Report

A Noise report was prepared as a supplemental report to the City's application to obtain its C of A permit. The methodology used in preparing the report followed MOE acceptable protocols. This included measuring and/or estimating the noise being generated at each source producing noise and modelling the noise to determine noise levels at the closest sensitive receptors.

In the report, four (4) sensitive receptors were chosen:

1. two-storey house at 251 Bradford St., approximately 50 m southwest of facility, 2m above grade;

2. two-storey house at 215 Bradford St., approximately 65 m west of facility, 2m above grade;

3. two-storey house at 193 Bradford St., approximately 40 m west of facility, 2m above grade; and

4. fifteen-storey residential condominium at 75 Ellen Street approximately 120 northeast of the facility

The Noise criteria as contained in MOE Publication NPC 205 "Sound Level Limits for Stationary Sources in Class I and Class II area were met at the sensitive receptors.

The following presents CTI's findings from its review of the Noise Report:

- The proposed 13-level condominium is to be located at 220 Bradford St, Barrie, Ontario. This location is between sensitive receptors POR1 and POR2 as identified in the AAR conducted for the Barrie WwTP. The proposed design includes balconies overlooking the WwTP.

- The AAR describes POR1, POR2 and POR3 at 2-storey residences. However, the elevation used to represent these sensitive receptors in the Cadna-A acoustic model were set at 2.0 m above grade. Typically 2-storey receptors are set at 4.5 m to represent on open second floor window (i.e. bedroom) with maximum exposure to noise sources at the facility.

- The AAR describes that the applicable noise limits were based on a previous acoustic project done for the WwTP. No data was presented in the report, thus it was not possible to confirm elevated background noise levels above MOE exclusionary minima.

- The AAR describes a 3 m berm constructed along the Bradford St shielding POR1, POR2 and POR3 from the plant. Note that the selected receptor heights for POR1, POR2 and POR3 were set at 2 m, thus shielded from noise sources at the plant.

- No example calculation was provided in the AAR demonstrating noise impact calculations from source to receptor to confirm noise impacts. Such an example would assist in evaluating noise impacts at higher elevations (i.e. remove barrier effects of berm).

- No detailed site plan was provided in the AAR clearly locating all noise sources. This would be required to estimate noise impacts at the proposed condo development.

- Several noise sources at the facility are quite loud and have the potential to create adverse noise impacts at the second floors of the current residences and at higher elevations in the proposed development.

- The noise impact at POR2 during the night period was estimated to be 46.4 dBA, slightly less than 49 dBA (applicable limit proposed in AAR). It is very probable that the noise impact level will increase with increased elevation above grade level such as the second floor of the house and/or at higher elevations at the proposed condominium building. This will be o receptors being located above the berm elevation of 3 m (i.e. no shielding effect) thus the receptors will have a direct line-of-sight to noise sources at the facility.

- For stationary noise sources, there are no indoor sound level limits. Outdoor sound level limits at the exterior plane of windows and outdoor amenity areas are considered to be sensitive point of receptors. MOE exclusionary minimum limits for Class 2 urban areas are:

  Daytime (7am–11pm) = 50 dBA (Leq 1)
  Night-time (11pm – 7am) = 45 dBA (Leq 1)

  The guidelines provide for an allowance of up to 5 dBA over the applicable limits for certain cases for some areas in transition.

Where the noise impact exceeds the applicable criteria, mitigation measures are necessary. The mitigation measures may be implemented on the site of the noise sensitive land use, or at the site of noise generation. Any mitigation measures required at the proposed condominium can be investigated at the time of detailed engineering design.

5.0 Environmental Compliance Approvals

We did not receive Environmental Compliance Approvals for the facility from the City. We obtained a copy of the Amended Environmental Compliance Approval, Number 8145-8D3PZ7 for the sewage works from the MOE's EBR website. The Acoustic Assessment Report stated that it was "completed to serve as a supplement report to the City's application to obtain a Certificate of Approval (Air/Nose) from the Ontario Ministry of the Environment". However, we were unable to confirm if there was an up to date Emission Summary and Dispersion Modelling (ESDM) report that has been prepared that would be included in an application.

In the province of Ontario, air quality and noise issues from industrial facilities, including sewage treatment plants, are addressed under the Environmental Protection Act (EPA) and the air pollution regulation, Ontario Regulation 419/05. The overriding philosophy of the Act and Regulation is to ensure that emissions from a facility do not cause an adverse effect, or cause harm to people, the environment, or the loss of enjoyment of normal use of property. For specific substances of concern, maximum concentrations at ground level are stated in the Regulation. For these compounds, companies are required to control their emissions to guarantee that concentrations will not exceed the specified regulated levels.

To help ensure that companies will not operate in a manner which will result in exceeding MOE air pollution limits, the EPA stipulates that companies must obtain an Environmental Compliance Approval (ECA) prior to the introduction of a new process, or modifying an existing process that may discharge a contaminant into the atmosphere. At the stage of reviewing an Application for an ECA, the MOE assesses the technical information and the predicted impact on air quality. The ECA will only be granted when the MOE is confident that the emissions are below regulated levels and, therefore, do not cause an 'adverse effect'.

In addition to the MOE evaluation for an application for a Certificate of Approval (Air), the Environmental Bill Registry (EBR) was established in 1994 to provide a formal framework for notifying the public about proposed legislation, policies, regulations and other legal instruments that could have a significant effect on the environment. In addition to providing public notification of proposed initiatives, it also provides a forum for public discussion on proposed changes being made to their communities. Any facility applying for an ECA has a description of their proposal posted on the EBR for a 30 day public comment period. The government considers all public input before making the final decision as to whether grant approval to the applicant.

The WwTP is required to have an up-to-date ECA showing that air emission regulations and noise criteria are being met.

6.0 Site Visit

A site visit was made on Friday April 26, at approximately 1:30 pm. At the time there was a slight wind blowing from the North to North West. Observations were made at the west, south and east property lines, with no odours detectable.

Standing at the subject property the predominant noise was from vehicle traffic on Bradford Street. When there was no traffic noise levels were approximately 45 dBA.

7.0 D-2 Guidelines

The MOE has published a set of Guidelines, D-1 to D-6, to be used in the planning process to prevent or minimize adverse effects from the encroachment of incompatible land uses where a facility either exists or is proposed. It is intended to apply when a change in land use is proposed.

The MOE D-2 Guideline addresses the compatibility between sewage treatment plants and sensitive land uses, and therefore is pertinent to the proposed development. The Guideline recommends that there be sufficient buffer between the facility and the sensitive land use and provides recommended separation distances. The separation distance is to be measured from the noise/odour structure to the property line of the sensitive land use.

For facilities greater than 25,000 cu.m/day the Guideline states that these plants would be dealt with on a case-by-case basis and that a separation distance of more than 150 m may be required.

Section 3.3 of the guideline addresses alternatives to buffers (separation distances). It states where buffers are not sufficient, additional mitigation of noise and/or odour may be required.

There are currently a number of sensitive land uses in the vicinity of the plant with about the same separation distance. The WwTP has installed considerable noise and odour control to ensure there is not an adverse effect at the existing sensitive land uses.

Odour Control implemented at the facility includes:

- Enclosure of all tanks and vessels
- 2 carbon adsorption towers
- Directing biogas to co generators and hot water boilers
- 2 Biotowers
- Activated carbon odour control system
- Biogas Flare

Noise Control Implemented at the facility includes:

- Standby diesel generators – silencers
- Outside intake louvers (2) – baffle plenum silencers
- Berm approximately 3m high along southwest perimeter of the facility

Due to the level of odour control at the WwTP, and provided that noise mitigation measures as outlined above, either at the source or the receptors, are implemented, it is our opinion that the recommended separation distance in the guideline is not required. It is to be noted that the D-2 Guidelines were published in 1995. At that time sewage treatment plants would not have the level of odour and noise control that is installed at the Barrie facility. The recommended separation distances included in the guidelines reflected the situation at the time the guidelines were published.

8.0 MOE Contact

Mr Chris Hyde, District Supervisor – Barrie District Office, was contacted on April 29, 2013. Mr. Hyde stated that he had not received any odour complaints from residences in the vicinity of the facility since the WwTP installed the most recent odour control equipment. He mentioned on occasion, about two times per year, the MOE would receive odour complaints from people using the recreational area to the west of the plant. He believes the odour resulted when there was maintenance being performed on odour control equipment. He remarked that the prevailing winds were from the west to east, i.e. from the WwTP to the lake.

9.0 Existing Residences

Existing residences are well-established near the WwTP. There are a number of single family homes on the west side of Bradford Street, across from the WwTP . We understand that these

houses were occupied prior to the operation of the WwTP . There is also a fifteen-storey residential condominium located at 75 Ellen Street, approximately 120 m northeast of the facility.

10.0 Conclusions and Opinion

Based on the review presented in this letter-report, the following is concluded;

1. While the separation distance from the subject property to the WwTP does not meet the recommended separation distance given in the D-2 Guideline, the odour control implemented at the facility is adequate to prevent an adverse effect at the subject property. The noise levels meet current MOE criteria at the existing residences, at 2 m, at the second floor the MOE criteria may not be met requiring further mitigation at the source. With the elevated height of the proposed development, the noise criteria may not be met at the higher levels of the proposed building. This issue can be addressed at the time of detailed design of the building with consideration given to implementing design features that would meet MOE noise criteria.

2. With the current level of odour control and the implementation of any required noise mitigation, the operation of the WwTP is not expected to be impeded. Provided that future expansion of the plant adopts appropriate odour and noise control measures, future operations of the facility are not expected to be impeded.

It is our opinion that air quality and noise issues should not prevent the proposed residential development from proceeding. However, as there is the potential for residences at the subject property to detect odours and noise on occasion a warning clause should be included in the draft plan conditions. Wording that may be considered is:

"Purchasers/tenants are advised that although industries are required to obtain an Environmental Compliance Approval from the Ministry of the Environment for their air and noise emissions, at times, odours and/or noise emanating from the neighbouring Waste Water Treatment Plant may impede the enjoyment of the subject property".

Should you have any questions, please do not hesitate to contact us.

Yours truly,
Church & Trought Inc.

John Trought, P.Eng.