To: Chair and Members
Planning & Economic Development Committee
Outstanding Business Item No. N/A and Issue: Liberty Energy
PED05021(a)

From: Lee Ann Coveyduck
General Manager
Planning and Economic Development Department
Telephone: 905 546-4339
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E-mail: lcoveydu@hamilton.ca

Date: January 12, 2006

Re: Peer Review of the Environmental Screening Report for Liberty Energy, 675 Strathearn Avenue (Hamilton) (Ward 4)

Council Direction:

Not applicable.

Information:

On June 21, 2005, a Public Meeting was held to consider an application for a modification in zoning to permit a private utility for the property located at 675 Strathearn Avenue (Hamilton) by Liberty Energy Inc. The Planning and Economic Development Committee passed the following resolution:

“20. Application for a Modification in Zoning for the Property Located at 675 Strathearn Avenue (Hamilton) (PED05021) (Ward 4) (Item 6.9) (Kelly/Ferguson)

That approval be given to Zoning Application ZAR-05-26, Liberty Energy Inc., applicant, for a modification to the "K" (Heavy Industry, etc.) District, to permit a private utility (electrical generating facility), for the property located at 675 Strathearn Avenue (Hamilton), as shown on Appendix “A” to Report PED05021, on the following basis:
(a) That the Draft By-law, attached as Appendix “B” to Report PED05021, which has been prepared in a form satisfactory to Corporate Counsel, be enacted by City Council.

(b) That the amending By-law apply the Holding provisions of Section 36 (1) of the Planning Act, R.S.O., 1990, to the subject lands by introducing the Holding symbol ‘H’ as a suffix to the proposed Zoning District. The Holding provision will prohibit the development of the subject lands until such time that the owner/applicant submits a Record of Site Condition, to the satisfaction of the Ministry of Environment. City Council may remove the ‘H’ symbol and, thereby, give effect to the “K” District, Modified provisions, by enactment of an amending By-law once the condition is satisfied.

(c) That the amending By-law be added to Section 19B of Zoning By-law No. 6593 as Schedule S-1527, and that the subject lands on Zoning District Map E-61 be noted as S-1527.

(d) That the proposed change in zoning is in conformity with the Hamilton-Wentworth Official Plan and the Official Plan of the City of Hamilton.

(e) That upon satisfying the condition of the ‘H’ symbol and submitting the required fee, the Director of Development and Real Estate, be authorized and directed to give the prescribed notice in accordance with the provisions of the Planning Act, and to prepare a By-law, in a form satisfactory to Corporate Counsel, to remove the ‘H’ symbol for presentation to City Council.”

On June 29, 2005, Council passed the following motion:

“20. Application for a Modification in Zoning for the Property Located at 675 Strathearn Avenue (Hamilton) (PED05021) (Ward 4) (Item 6.9) (Merulla/Jackson)

That this item be tabled for two weeks to allow staff to address some of the inconsistencies in the staff report and to provide an understanding with respect to the environment assessment component of the project.”

On July 18, 2005, Council adopted the following motion:

“7.1 Application for a Modification in Zoning for the Property Located at 675 Strathearn Avenue (Hamilton) (PED05021) (Ward 4) (Kelly/Pearson)
That approval be given to **Zoning Application ZAR-05-26, Liberty Energy Inc., applicant**, for a modification to the "K" (Heavy Industry, etc.) District, to permit a private utility (electrical generating facility), for the property located at 675 Strathearne Avenue (Hamilton), as shown on Appendix “A” to Report PED05021, on the following basis:

(a) That the Draft By-law, attached as Appendix “B” to Report PED05021, which has been prepared in a form satisfactory to Corporate Counsel, be enacted by City Council.

(b) That the amending By-law apply the Holding provisions of Section 36 (1) of the Planning Act, R.S.O., 1990, to the subject lands by introducing the Holding symbol 'H' as a suffix to the proposed Zoning District. The Holding provision will prohibit the development of the subject lands until such time that the owner/applicant submits a Record of Site Condition, to the satisfaction of the Ministry of Environment. City Council may remove the ‘H’ symbol and, thereby, give effect to the "K" District, Modified provisions, by enactment of an amending By-law once the condition is satisfied.

(c) That the amending By-law be added to Section 19B of Zoning By-law No. 6593 as Schedule S-1527, and that the subject lands on Zoning District Map E-61 be noted as S-1527.

(d) That the proposed change in zoning is in conformity with the Hamilton-Wentworth Official Plan and the Official Plan of the City of Hamilton.

(e) That upon satisfying the condition of the ‘H’ symbol and submitting the required fee, the Director of Development and Real Estate be authorized and directed to give the prescribed notice in accordance with the provisions of the Planning Act, and to prepare a By-law, in a form satisfactory to Corporate Counsel, to remove the ‘H’ symbol for presentation to City Council.

(f) That the City of Hamilton request the Ministry of the Environment conduct a full Schedule C Environmental Assessment on this application and that the application be evaluated as a waste management project.”

On December 7, 2005, Liberty Energy Inc. posted a Notice of Completion of their Environmental Screening Report in the Hamilton Spectator, in accordance with the Ministry of the Environment’s “Guide to Environmental Assessment Requirements for Electricity Projects” (March 2001) and Ontario Regulation 116/01. The purpose of the Notice was to initiate the 30 day public review period. Due to the Christmas holiday, the proponent voluntarily extended the public review period 10 days, which now concludes on January 17, 2006.
To address Council’s resolution for a full Schedule C Environmental Assessment, staff hired an independent consulting firm, Dillon Consulting, to undertake a Peer Review of Liberty Energy’s Environmental Screening Report. The results of this Peer Review are attached as Appendix “A” to this report. The Peer Reviewers are in agreement with the classification of the undertaking as a “Category B” project, and do not believe that elevating the project to an individual EA is necessary. However, they have identified several concerns with the EA, which relate to both the EA process as well as some technical considerations, which they feel can be addressed through the preparation and submission of a revised Environmental Screening Report. If the concerns cannot be addressed to the City’s satisfaction, then the Environmental Screening Report should be elevated to an Environmental Review. In this regard, the proponent has agreed to provide the City with this additional information and staff will be meeting with them to discuss this issue.

In the meantime, as directed by Council, staff has forwarded a letter to the Ministry of the Environment requesting a full Schedule C Environmental Assessment, and that the application be evaluated as a waste management project, in order to meet the January 17, 2006, Public Review deadline.

_______________________
Lee Ann Coveyduck
General Manager
Planning and Economic Development Department

:PD
Attach. (1)
MEMO

TO: Peter Delulio (City of Hamilton)

FROM: Don McKinnon

DATE: January 5, 2006

SUBJECT: Liberty Energy Centre EA – Peer Review Results

The following outlines the results of our review of the Environmental Screening Report that was prepared for the proposed Liberty Energy Facility. Our review examined both EA process and technical considerations. In preparing our review, consideration was given to the requirements for an Environmental Screening as outlined in the Guide to Environmental Assessment Requirements for Electricity Projects (“Electricity Project EA Guide”). As well, given the nature of the facility, particular attention was given to potential air quality and noise effects. We have documented the result of our review in the form of questions and comments as outlined below. We have assumed that the City will use these comments as the basis of their submission to the proponent. We would be pleased to assist you in preparing your submission letter.

Summary of Comments

Based on our peer review of the Environmental Screening Report for the Liberty Energy Facility, it would appear that the requirements of the Electricity Project EA Guide were generally met. As a 10 MW biomass fueled energy facility, we agree with the classification of the undertaking as a “Category B” project and thus requiring the completion of an Environmental Screening. We note that under the “Electricity Project EA Guide”, energy project proponents are not required to justify project need nor consider alternatives. The process is to be focused on the assessment of potential effects, a determination of their significance and a review of project advantages/disadvantages. No formal approval is required by the MOE, the “environmental screening” process is essentially a self-assessing process.

The facility has been well located. The area is designated for industrial uses and there are few residences and natural environmental features in the immediate vicinity of the facility. Should the proposed mitigation measures be effective, the facility would likely result in few effects on the surrounding environment. However, through our review we have identifies several concerns with the EA, which relate to both the EA process as well as some technical considerations. Most of our concerns relate to how the proponent presents the potential for effects and the assumed effectiveness of some mitigation measures. The key issue we have is in regards to the traceability of their conclusions as in many, cases the technical support information is missing for many of the “no effects” conclusions. Our key concerns summarized as follows:

1. As required in the Electricity Project EA Guide, the proponent is to identify the potential for effects by answering each of the screening criteria questions without mitigation in place. The proponent has failed to do this. The screening report contains no completed table that identified potential effects without mitigation in place. The City should request that this be provided.
2. Several study areas were introduced in the screening yet no justification was provided for them. Justification for these study areas should be provided.
3. A description the project construction activities should be requested which would be used as a basis to assess the potential for construction related effects.

4. Given the potential for contaminants in runoff from the stockpiled biomass on site, the City should request that more details on how stormwater will be managed be provided.

5. The proponent should be requested to describe the results of any on-site soil tests and a description of impact management measures that will be put in place should contaminated soil be encountered during construction.

6. It is not realistic to assume no odour emissions whatsoever from the facility. The proponent should be requested to describe in more detail type and form of odour monitoring and mitigation to be put in place. The proponent should provide examples of other similar biomass storage facilities and the resulting odours from these other facilities and the effectiveness of mitigation.

7. Regarding impacts on air quality, the study methodology provides final emissions numbers but does not show what the uncontrolled emissions would be. This information is essential in determining whether or not the proposed control efficiencies are reasonable given the current state of the technology. Since the calculation methodology has not been illustrated in the report, we are unable to verify the calculations. The proponent should be requested to provide the uncontrolled emission levels and the calculation methodology.

8. While the air modeling has been done in a reasonable manner and we agree with the use of the site-specific meteorology, given the limited emissions information provided in the report, we cannot comment on the accuracy of the air emission estimates. The details to support their conclusions should be requested.

9. Regarding noise effects, while the outlined methodology appears to be sound, there is insufficient information in the Noise Report to confirm the conclusions reached. The proponent should be requested to provide: a site plan that outlines the noise sources; supporting information to justify the sound power levels of project components that would be a noise source; and details on the assumed noise barriers to be in place.

10. The description of the socio-economic conditions is focused on census data for the City as a whole. This information is not necessarily representative of the study area. The proponent should be requested to provide a more representative description of the socio-economic conditions of the local study area including mapping/air photos that document land use. Information obtained from the public consultation activities should be used to support the description of social and economic conditions in the study area.

11. The screening has not adequately assessed the potential for effects on other businesses and their employees in the surrounding area. The screening does not even contain a listing or map of the surrounding businesses. The designation of these surrounding lands for industrial uses is not reason in itself to ignore the potential for these effects. The proponent should be requested to examine the potential for these effects.

12. No information is included to support the conclusion that there will be no effects on traffic. This information should be requested of the proponent.

13. A summary of key comments received from the public should be included in the main body of the report and a description included as to how these concerns were addressed/incorporated.

14. We have made several recommendations regarding how the City should be involved in the development and implementation of impact management measures.

We would expect that the proponent could address most, if not all, of our issues through the preparation and submission of a revised screening report. Your submission letter should be worded to indicate that should the proponent be unable to address your concerns to your satisfaction, the City would then expect that the environmental screening be elevated to an environmental review. We do not believe that elevating this project to an individual EA is necessary.
The following presents our comments in more detail. Key issues/requests are highlighted in bold.

**Screening Process**

- The “Electricity Project EA Guide” outlines the process to be followed to conduct an environmental screening. For the most part the proponent follows this process. The basis of their assessment is the screening criteria as contained in Appendix C of the Electricity Projects EA Guide (presented as “assessment key questions” in the screening report). Also presented in some cases are “valued ecosystem components” (VECs) and “key indicators” to further explore the key assessment questions.
- As specified in the “Electricity Project EA Guide”, the initial step of completing the screening is to answer each of the screening criteria questions in the form of a checklist table. For the purposes of completing this checklist, mitigation or impact management measures are not to be considered. This process is intended to identify which issues the screening process should focus on (i.e. those for which there is a potential for effects to occur). In the Liberty Energy Facility Screening Report, the criteria are presented in Table 2-1 and then again in Table 15-1 (in the form of a summary of the assessment results). The Report does not however contain a completed screening table that identifies the potential for effects without mitigation being assumed, as is required by the Electricity Project EA Guide. Ultimately all the questions are addressed in the screening report, however, answering the question without mitigation in place clearly shows where there are potential for effects and allows the report to be much more focused by screening out those criteria/issues that do not apply to the project (e.g. due to an absence of the feature in the study areas). **We therefore recommend that the City request that the proponent include in their screening report a completed effects checklist table without assuming mitigation measures to be in place.**
- Three study areas are defined: site study area, local study area, and regional study area. The local study area is defined as a 2x2 km area from the site. There in no rationale provided for this study area. **The justification for these study areas should be requested.** (i.e. is it the maximum distance expected for local environmental effects?)

**Project Description**

- The proponent adequately describes the ultimate project and its major components. Location maps/air photos are provided. What is not included however, is a description of the construction process and timing. As the construction period can result in potential effects, which were assessed in the screening, we feel it is important that the construction activities be described so as to provide a basis for the assessment of construction related effects. **A description the project construction activities should be requested which would be used as a basis to assess the potential for construction related effects.**

**Effects Assessment Sections**

- Throughout the effect assessment sections, Linkage Diagrams are provided to illustrate the potential for effects from project activities on the various environmental components that were considered. Two possible linkages are shown: “valid linkage” and “invalid linkage”. In most cases, the linkages shown were considered to be an “invalid linkage”. We find these linkage diagrams to be confusing and perhaps even misleading. As an example, for Key Question 1.3 that explores effects on surface water, Figure 4-3 suggests that there is no linkage between project construction and project operation with surface water quality thus suggesting there is no effect. We disagree. The project of this nature has the potential to result in surface water effects from...
runoff during both the construction and operation periods. Although for many of these effects, mitigation measures will ultimately reduce or eliminate these effects, we believe that the linkage diagrams need to show where effect potential exists prior to the application of mitigation/impact management. This is consistent with the requirements of the “Electricity Project EA Guide”. In other cases, such as for Key Question 4.3, which considered effects on wetlands, again an “invalid linkage” is shown in Figure 7.3. The reason for the “invalid linkage” being shown in this case is because of the absence of wetlands in the study area. Thus, we have diagrams showing “invalid linkages” in cases where there is potential for effect, but mitigation is assumed to eliminate this potential effects, and other diagrams that show “invalid linkage” because no such feature is located in the study area. Again, we feel that this is confusing as it is not clear to the reader as to where there exists potential for effect. Mitigation measures may not be effective. The screening report needs to be clear in its presentation as to where the potential for effect exists. The proponent should be requested to illustrate where there is potential for effect in the linkage diagrams without mitigation being assumed.

Had the screening process first screened out those key questions for which clearly there exists no potential for effect (due to an absence of the environmental component or because of the nature of the project and the types of effects resulting from it), then the presentation of project effects without and with mitigation in place would have been much easier to understand by the reader.

In the “Linkage Analysis” section of the screening report, construction and operation effects are not clearly distinguished. The use of subheadings would help. Where there is no potential for either of these types of effects, this needs to be clearly stated, as opposed to be silent on the issue. The proponent should be requested to clear describe both construction and operation related effects.

For many sections although effects are described and mitigation presented, there is no concluding assessment regarding the potential for net effects and their significance (e.g. summary of effects for surface and ground water, land effects, air and noise effects, heritage and cultural effects, and aboriginal effects). We find the screening to be deficient by failing to clearly provide this information for some key questions and a request should be made to clearly describe the significance of effects for all environmental components considered.

Surface and Ground Water

- Although reference is made of MOE well record data, we found no description of current ground water usage in the study area. **A description of well water use in the area should be provided.**
- For key question 1.1 to 1.4 there is no clear description of net effects and an assessment of significance of those effects. Table 4-4 indicates that there will be no net significant effects, but there does not appear to be clear justification for this.
- We have concerns with the potential for runoff from the biomass storage areas. A description of mitigation measures is provided on pg. 44. **The City should request that more details be provided on the measures that will be put in place to manage this run-off.**
- For Key Question 1.4 an “impact assessment” section is included. We question why is there no such section for key questions 1.1 to 1.3?

Land

- There is no description of existing conditions or an explanation for the absence of it, as is required by the Electricity Projects EA Guide. **This description of existing conditions should be requested.**
In addressing Key Question 2.1, a 500 m study area is introduced. This study area was not outlined in the initial sections of the report. The rational for this study area should be requested.

Construction activities could have an affect on surrounding land uses. “Construction Activities” should be added to Figure 5-1.

Figure 5-2 is an air photo of the “500m surrounding site study area”. We request that the land uses be identified on the air photo to allow a better understanding the surrounding land uses. The study area should also be extended out to the originally identified 2x2 km site vicinity study area unless there is justification for this smaller 500 m study area for this key question.

In addressing Key Question 2.5, no description of the potential for contaminated land at the site is described. This is a potential concern given past industrial land uses at the site, which have a high potential for contamination, and potential excavation activities that may be required for the project. The proponent should be requested to describe the results of any on-site soil tests and a description of impact management measures will be put in place should contaminated soil be encountered during construction.

Air

Detailed comments on the air quality assessment are provided in Attachment I.

Ten residential receptor locations are identified on page 61. A map showing the location of the 10 receptor locations should be provided to clarify the location of these receptors.

The Screening Report should reference the detailed Air Quality Study Report.

We are concerned with the potential for biomass storage related odours. The Screening Report makes reference to the use of less-compostable biomass that should produce minimal odours (page 105). More details should be requested on the type of biomass (and the expected quantities) to be used at the facility. It is suggested that aeration would be used to control possible odours. More details on how odours would be controlled are requested. We suggest that the proponent provide examples of other similar biomass storage facilities and the resulting odours from these other facilities.

There is no rationale provided as to the significance of potential dust and odour effects in addressing Key Question 3.3. This is to be provided.

Noise

Detailed comments on the noise assessment are provided in Attachment II.

Reference is made to receptors R2 and R3 on page 79, yet they are not shown in Figure 6-3. They need to be added to Figure 6-3.

The screening report should reference the detailed noise study report and a more detailed description of potential noise effects including the modeled noise levels.

There is no rationale provided as to the significance of potential noise effects in addressing Key Question 3.4. This should be provided.

Natural Environment

To support the description of natural environment features in the study area starting on page 111, we request that a map/air photo be included that illustrates the noted features.

Socio-economics
The description of the socio-economic section starting on page 133 is focused on census data for the City as a whole. This information is not necessarily representative of the study area. We request that a more representative description of the socio-economic conditions of the local study area be provided including mapping/air photos that document land use. Information obtained from the public consultation activities should be used to support the description of social and economic conditions in the study area.

In addressing Key Question 6.1, the analysis suggests that there will be no effects on the social environment. It is our opinion that the analysis greatly understates potential effects from the proposed facility. Effects that will occur include: construction related effects such as dust and increased air emissions, visual effects from the steam plumes, potential odours and increased truck traffic during the operations period. These effects are likely to occur. Although these effects may not be significant, they should be described in examining the social effects of the project. We request that the analysis be amended to indicate that social effects may be possible, although they may be shown as not being significant. In addressing Key Question 6.1, reference is also made to the potential economic effects of the facility. The discussion of economic effects should be moved to Key Question 6.2.

Key question 6.2 considers the potential for effects on local businesses. There is no description or mapping of business enterprises in the local study area including an assessment of their sensitivity to the project. This needs to be provided. Also not considered is the potential for effects on employees of other businesses in the local study area. The City should request that the Screening assess the potential for effects on local businesses and employees.

Reference is made to there being no public facilities within 500 m at the bottom of pg. 139. Again, what is the basis for this 500 m study area?

We request that details to support the conclusion that there will be no effects on traffic be provided in addressing Key Question 6.7. This conclusion cannot be verified based on the information provided. The proponent should be requested to include the information to support these findings.

In regards to Key Question 7.2, it is suggested that the cooling tower plumes will occur on an infrequent basis and indicates that Section 6 describes this. We find no details in the Screening Report that describes the frequency of these events and the conditions under which these plumes would be most visible. The City should request that this information be provided. As well, it suggests the plumes would not be distinguishable from plumes of other industries in the area. No details are provided as to the extent and frequency of other plumes in the area. We request that this information be provided.

Consultation

It would appear that the consultation program that was undertaken meets the requirements of the Electricity Project EA Guide. The Consultation Section largely describes the activities that were undertaken. It does not however include a summary of the key comments and concerns of the public/agencies. Although this information is detailed in an appendix, it would have been valuable to have a summary of the main issues (and outlined as to how these issues were addressed) in the main body of the Screening Report. The City should request that this be provided in the revised Report.

Mitigation

The list of mitigation measures to be employed appears to be generally adequate. We offer the following comments:
The City should request to be copied on drafts of the Health and Safety Plan, Emergency Response Plan, Environmental Management Plan and Operations Plan and be provided the opportunity to review and comment on them.

We suggest that the facility be subject to a regular (say annual) environmental audit process whereby the results of that audit are made publicly available.

The proponent should be asked to described how their environmental commitments will be monitored and enforced.

The City should request that they be provided the opportunity to sit on the Community Liaison Committee.
ATTACHMENT I
Peer Review of Air Quality Study Report  
for the Proposed Liberty Energy Centre  
675 Strathearne Avenue, Hamilton, ON

Introduction

The following documents the detailed peer review of the Air Quality Study Report for the Proposed Liberty Energy Centre. Also considered were Sections 3 and Section 6 of the Environmental Screening Report. Dr. Stephen Lanning, PhD., CCEP of Dillon Consulting, undertook this peer review. Major points in the following review have been bolded.

Facility and Process Description

Facility and Process Overview

The proposed Liberty Energy Centre will be situated on a 2.3 hectare industrial parcel of land located at 375 Strathearne Avenue in northeastern Hamilton. Two buildings (Figure 1) will eventually each house a gasification process train each producing 5MW of electricity to the grid. The when both units are in operation the plant will consume up to 1089 tonnes per day of biosolids and 508 tonnes per day of biomass. The Liberty Energy Centre will be a base-loaded power plant and will be capable of operation 24 hours per day / 7 days per week.

The gasifier train will consist of a fluidized bed combustor. Fuel (biosolids and biomass) will be separately injected to the system where it first mixes with the hot suspended bed material and gasifies. The bed material is a mixture of sand and limestone. Hot fuel gas is combined with staged combustion air to complete the combustion in the upper furnace area.

Emissions Control

Emissions control is designed using a multi-stage process and these are shown diagrammatically in Figure 5-1.

In the remainder of the control process, limestone will first be added to the fluidized bed medium as needed to reduce acid gas emissions in the gasifier. Ammonia is then introduced into the overfire air to reduce nitrogen oxides. Combustion air from the gasifier then first passes through a multiclone before being introduced to a dry scrubber. At this stage, calcium oxide, calcium chloride and carbon are introduced to remove sulphur dioxide, hydrogen chloride and mercury. Final particulate removal is carried out using a baghouse.

Other Odour Control

Biosolids will be delivered to the site by truck, unloaded into a pit equipped with a self unloading floor discharging to a bucket elevator (Section 3 of Environmental Screening Report). This elevates the biosolids to the top level of 60-foot high storage silos located at the rear of the unit. Onsite storage capacity will be approximately 4-days supply. Biosolids are then pumped directly to the gasifier. It is noted that air the biosolids reception, unit, the enclosed elevator and the silos will be ducted to combustion air for system odour control. This is an inconsistency between the report and Figure5-1. The diagram shows carbon filters on each silo.
Biomass fuel will typically consist of garden waste, agricultural waste, arbour waste, forestry waste and clean dimensional lumber (Section 3 of Environmental Screening Report). The biomass will be stored in open areas occupying 9250 m² on the site. The screening report notes that to control potential odours from this part of the process, material moisture will be controlled by mixing to maintain aerobic conditions. In addition odorous materials will not be accepted on the site.

The study seems to be saying there will be no odour emissions from the site and mentions wetting the biomass to prevent small material to become airborne. One would expect wet woody biomass to create odours depending on aeration and temperature. The study mentions the use of masking agents in odour reduction. These have not been proven in all situations and may indeed exacerbate the problem. **It is not realistic to assume no odour emissions whatsoever from the facility. The proponent should be requested to describe in more detail type and form of odour monitoring and mitigation to be put in place.**

**Emissions Assessment**

According to the Study, emissions were first computed using a variety of methodologies; these emission rates were then used as input to a dispersion model; and predicted air quality concentrations were compared to applicable MOE criteria, or in their absence to criteria from other Canadian jurisdictions. The emissions assessment was generally conducted in accordance with the procedures laid down in O.Reg. 419/05, which came into effect on November 30th 2005.

Tables 2.1 – 2.3 in the Report provide the magnitude criteria used in the discussion. Golder uses the effects magnitude shown in Table 1 below. Since the proponent would not be permitted to operate with emissions greater than the MOE criteria limit, corresponding to the ‘high’ value in the table this indicator is of little value. **It would have been more useful to have used the ‘high’ criteria to refine the below-limit emissions levels. It would also have been useful to define the source of the criterion used (Provincial, Federal etc.)**

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<th>Magnitude Definition of Concentration</th>
<th>Percentage of Criterion Limit</th>
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<tr>
<td>Negligible</td>
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<tr>
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<td>10% &lt; Conc &lt; 50%</td>
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<tr>
<td>Moderate</td>
<td>50% &lt; Conc &lt; 100%</td>
</tr>
<tr>
<td>High</td>
<td>Conc &gt; 100%</td>
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</table>

**Background Levels**

The report provides considerable detail on background levels of the Criteria Air Contaminants (nitrogen dioxide, sulphur dioxide, carbon monoxide and particulate) and other priority compounds (cadmium, hexavalent chromium, manganese, lead, benzene, 1,3-butadiene and benzo(a)pyrene). This assessment includes data from a number of air monitoring stations within 2500 metres of the proposed facility.

It is noted that while many emission parameters have shown a statistically decreasing trend, levels of some parameters in the vicinity of the proposed facility show significant exceedances of Ambient Air Quality Criteria (AAQC) levels. **This being the case, an argument could be made for the assessment of facility emissions to include background.** An example of this would be in the case of suspended particulate and its size fractions PM10 and PM2.5. While not normally considered in Approvals...
submissions, the application of background numbers to the consideration of facility approvals has some precedent in Ontario and is common practice in other Canadian jurisdictions. This should only have an impact for emission impacts which are in the ‘moderate’ range as defined in the Study.

The closest stations are shown in Table 2. It should be noted that these stations do not all report a consistent set of parameters as is shown for particulate data in the Table.

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<th>ID</th>
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<th>Distance (m)</th>
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Facility Emissions

Facility emissions are reported to have been estimated by means of US EPA emission factors, mass balances and engineering calculations. However, the report does not provide any details of the calculations other than general specifications of feeds and EPA section numbers. One would normally expect that sample calculations would have been included. The proponent should be requested to provide them.

Emissions have been grouped into:
- Process trains;
- On-site vehicles and process equipment;
- Fugitive emissions; and
- Cooling towers.

The source of emissions calculation methodologies referenced in the Report are presented in Table 3.

<table>
<thead>
<tr>
<th>Source of Emission</th>
<th>Referenced Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process trains</td>
<td>AP-42 Sections 1.6 (Wood residue combustion)</td>
</tr>
<tr>
<td></td>
<td>AP-42 Section 2.2 (Sewage sludge incineration)</td>
</tr>
<tr>
<td>Biomass chipper</td>
<td>AP-42 Section 3.4 (Diesel engines)</td>
</tr>
<tr>
<td>Trommel screen, excavator, loader and</td>
<td>AP-42 Section 3.3 (Gasoline and diesel industrial engines)</td>
</tr>
<tr>
<td>emergency generator</td>
<td></td>
</tr>
<tr>
<td>On-site truck traffic</td>
<td>EPA/Environment Canada MOBILE 6.2C model used for tailpipe emissions</td>
</tr>
<tr>
<td>Road dust</td>
<td>AP-42 Section 13.2.1 (Road dust)</td>
</tr>
<tr>
<td>Biomass storage piles</td>
<td>No method referenced</td>
</tr>
<tr>
<td>Ash handling</td>
<td>No method referenced</td>
</tr>
<tr>
<td>Odour</td>
<td>No odour emissions estimated</td>
</tr>
<tr>
<td>Cooling towers</td>
<td>No method referenced for emissions</td>
</tr>
</tbody>
</table>
While the methodologies referenced in Table 3 are reasonable and should produce conservative emissions numbers, we have not been able to validate the numbers provided. Emissions from individual sources have only been provided as facility totals in the report and therefore have not been separately apportioned to sources or processes. The Study methodology provides final emissions numbers but does not show what the uncontrolled emissions would have been. This information is essential in determining whether or not the proposed control efficiencies are reasonable given the current state of the technology. The final facility emission rates calculated in this assessment will become the engineering specifications that vendors will be required to meet. Some of our calculations indicate that very high control efficiencies will be needed to maintain the quoted level of emission. Since the calculation methodology has not been illustrated in the report we are unable to verify the calculations.

It is noted that on page 77 of the Study, it is noted that “The complete list of emission sources, along with their source parameters and emission rates can be found in Table 5-8 for point sources and Table 5-9 for volume sources.” A review of the above mentioned Tables however shows that while some source parameters are listed none of the emission rates have been included.

Emissions from the two process trains are the results of the combustion of the gases generated in the biosolid/biomass gasification process as well as tailpipe emissions from the biomass chipper, which are being directed to the gas combustor. Three fuel scenarios were considered (see Table 4) and the highest emission from any scenario was reasonably taken as the maximum possible emission of that contaminant. The rationale for the various scenarios is given as the maximum daily limit for each fuel; however this is not completely explained. This explanation should be provided.

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Process Train Emission Scenarios (Amounts for both trains combined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Type</td>
<td>Scenario 1</td>
</tr>
<tr>
<td>Biosolids -tonnes/day @75% moisture</td>
<td>1089</td>
</tr>
<tr>
<td>Biomass – tonnes/day @ 30% moisture</td>
<td>417</td>
</tr>
<tr>
<td>Daily fuel total - tonnes</td>
<td>1506</td>
</tr>
</tbody>
</table>

Emissions Controls

The Study provides general information on the type of emissions controls that will be used. These generally correspond to industry standards for control of this type of emissions and are therefore reasonable. While mention is made of the control technologies, assumed removal efficiencies are not provided. Instead, target emission limits are given for each contaminant, which appears to be derived from the emission estimate and unspecified contaminant removal efficiency. Table 5 below shows the levels of control efficiency as obtained from the numbers quoted in the study.
Table 5

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Reduction technology</th>
<th>Reported reduction or emission limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen oxides</td>
<td>Selective non-catalytic reduction (SNCR) – ammonia injection</td>
<td>86% or 30 ppmvd @ 11% O2</td>
</tr>
<tr>
<td>Sulphur dioxide</td>
<td>Lime injection in fluid bed and scrubber</td>
<td>98.7%</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>Lime injection in fluid bed and scrubber</td>
<td>99.8%</td>
</tr>
<tr>
<td>Mercury</td>
<td>Powdered activated carbon (PAC) injection in scrubber</td>
<td>99.7% or 0.0042 kg/day</td>
</tr>
<tr>
<td>Particulate</td>
<td>Baghouse</td>
<td>99.99%</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>Combustion control</td>
<td>30 ppmvd @ 11% O2</td>
</tr>
<tr>
<td>Dioxins</td>
<td>Combustion temperature control and PAC injection</td>
<td>Not specified</td>
</tr>
<tr>
<td>Fugitive particulate</td>
<td>Procedural control of fines from storage piles and roadways</td>
<td>Not specified</td>
</tr>
</tbody>
</table>

It is noted that in most cases, these control efficiencies are at the upper bound of the available technology, no assessment is made as whether or not these efficiencies are achievable in the context of this facility. Rationale and support for the assumed levels of control efficiency should be requested.

Impact Assessment

The proposed facility will be located in the urban area of Hamilton near the western end of Lake Ontario. The meteorological characteristics of the site are therefore quite complex. Wind flow and stability characteristics are influenced by the land/water temperature contrasts and well as frictional effects associated with both terrain and land use. The Study notes that the terrain is gently sloping from Hamilton Harbour to the proposed site with the Niagara Escarpment rising to 191 metres approximately 4km to the southwest.

To determine offsite impacts from the facility emissions the Study uses the approved AERMOD dispersion model. This utilizes actual terrain and meteorological data and provides a much better simulation of potential contaminant impact than does the old MOE Reg346 dispersion model. The normal mode of operation is the use the model with a MOE Regional Meteorological Data Set, however, O.Reg. 419/05 and the Modelling Guidelines provide for the use of a more site specific data set if conditions warrant. Plumes from the cooling towers have been modeled with the EPRI SACTI Model.

We agree with Golder that the generic Regional Meteorological Data Set for Hamilton (based on London Airport for surface data ad Buffalo Airport for upper air data) may not be appropriate for the situation. The Study therefore uses five years of data from the Royal Botanical Gardens met station (1999-2003) together with the corresponding Buffalo upper air data to provide a more site specific data set. While not perfect, given the location and exposure of the RBG meteorological station, it is probably more representative than the Regional Data Set for this location. The surface characteristics used for the model sectors are reasonable.

The modeling also used the AERMAP pre-processor to process the MOE Digital Elevation Model (DEM) terrain elevation data. The receptor grid used is that specified by the MOE in the modeling guideline and is reasonable for this application. In addition a receptor was placed at ten of the residence locations...
closest to the proposed facility as determined from aerial photography. These were located approximately
800 metres form the facility boundary.

Other model inputs specified in the Study include (1) the use of the PRIME downwash algorithm for
estimation of building wake impact; and option which is reasonable and (2) the option to ignore dry or
wet deposition which will produce conservative concentration estimates (e.g. for particulate) at distance
from the site.

Table 7-1 of the Study shows the maximum predicted ground level concentrations in micrograms per
cubic metre for all modeled contaminants at (a) the fence line; (b) beyond the fence line to the limit f the
model domain; and (c) specifically at the residence receptors. These concentrations have then been rated
as negligible, low, moderate or high according to the rationale discussed previously.

The tables indicate no contaminant impact higher than the ‘negligible’ rating was found at any of the
residence receptors. At receptors located at or beyond the fence line, the only contaminants which rated a
‘moderate’ included particulate, and oxides of nitrogen. Sulphur dioxide, fine particulates, ammonia and
benzene received a ‘low’ rating with all others being ‘negligible’

Conclusions

The Study concludes that:

(a) All possible emissions from the facility have been conservatively estimated.

While the estimation methodologies are generally consistent with best practice, we have
no way of determining whether or not these methods have been accurately applied.

(b) There will be no odorous emissions leaving the property.

Given the current MOE limit of 1 ou/m3, and the extent of the storage piles, we cannot
agree with the conclusion reached that no odour emissions will leave the property.

(c) The only sources of fugitive emissions will be associated with vehicular traffic.

(d) Only compounds specified as Key Indicators had a non-negligible impact; and

(e) No compound had a non-negligible impact at the nearest residential receptors.

While the modeling has certainly been done in a reasonable manner and we agree with the use
of the site specific meteorology, given the limited emissions information provided in the report,
we cannot comment on the accuracy of the above statements. However, if the emissions can be
kept to the controlled levels specified in the study then we do agree that the introduction of the
Liberty Energy Centre should not appreciably increase the levels of the identified contaminants
at the site.
ATTACHMENT II
Peer Review

of

‘ENVIRONMENTAL NOISE STUDY FOR THE LIBERTY ENERGY CENTRE 675 STRATHEARNE AVE., HAMILTON, ONTARIO’

By: Golder Associates Ltd.
Dated: December 2005

Review Prepared on behalf of Dillon Consulting Limited

By

Hugh Williamson Associates Inc.

1 January 2006
Peer Review of  
‘ENVIRONMENTAL NOISE STUDY FOR THE LIBERTY ENERGY CENTRE 675 STRATHEARNE AVE., HAMILTON, ONTARIO’

Referenced Documents


4. Information to be Submitted for Approval of Stationary Sources of Sound, Ministry of Environment Publication NPC-233, October 1995.

Background

At the request of Dillon Consulting Limited, Hugh Williamson Associates has undertaken a peer review of the Environmental Noise Study report\(^1\) of the proposed Liberty Energy Centre. Section 6 of the Environmental Screening Report\(^2\) for the proposed Liberty Energy Centre was also provided to the reviewer for information.

This peer review is based on a desk review of documents 1 and 2 above. The reviewer has not had the opportunity to visit the site.
Review Comments

1. The sound impact analysis report generally follows the methodology of the Ministry of Environment, MoE, for the assessment of on-site noise for this type of proposed operation as contained in documents NPC-232 and NPC-233.

2. Based on the information provided on the locality, the reviewer agrees that the acoustical environment at receptors should be classified as ‘Urban’ Class 1 or Class 2. It is also agreed, based on the results of the monitoring, that the 24-hour minimum noise limit of 48 dBA, $L_{A_{eq}, 1-hr}$, is appropriate at receptor R1. It also appears reasonable to take this minimum noise limit as being applicable to receptors R2 and R3.

3. The study uses the accepted procedure for noise assessment as follows.
   - Noise source data is provided for pieces of equipment and operations in Table 2-1 of the report.
   - Noise level predictions due to the noise sources at each receptor are provided in Table 4-2 of the report, and, these predictions are supported by sample calculations in Appendix IV.
   - On the basis that the predicted sound levels at each receptor is less than 24-hour minimum noise limit, 48 dBA, the report concludes in Section 5 that ‘noise control measures are not required for any of the proposed noise sources on-site’.

While this procedure is correct, there is insufficient information in the report for a meaningful technical review of the study and its conclusions. Areas where additional supporting information is needed are set out below.

4. The proposed facility operations are set out only in general terms in Section 2.2 of the report. For example the numbers and locations of stacks, intake louvres, and discharge louvres are not stated. It is recommended that a site plan be provided which shows the locations, heights and numbers of noise sources. The site plan should also show the locations and heights of major buildings on the site if these are relevant to sound attenuation.

5. The noise source data in Table 2-1 is said, in Section 3.2, to come from the Golder database of similar noise sources. This approach is common and acceptable in noise assessment for common items of equipment such as trucks, loaders, and transformers. However, the noise source data for some of the items listed in Table 2-1 will depend on specific equipment selected and design parameters for this project. It is recommended that further supporting information, such as equipment manufacturer’s data, be provided to justify the sound power levels given in Table 2-1 for the following items: Cooling Towers, Stacks, Biomass Grinder, Intake Louvres and Discharge Louvres.
6. In the sample calculations, Appendix IV, barriers of substantial height are assumed for most of the noise sources. The natures of these barriers are not explained in the report, but in effect, these barriers are acting as substantial noise mitigation measures. It is recommended that additional information, such as a site plan, be provided which shows the locations, heights and extents of barriers which are assumed as the basis for the sound level predictions.

7. It is recommended that a key to the meaning of the zoning symbols be provided for the zoning map in Appendix 1.

Hugh Williamson, Ph.D., P.Eng.
Member, Canadian Acoustical Association