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Project No. 1522171

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**AIR QUALITY ASSESSMENT REPORT – PORT FUELS & MATERIAL SERVICES
HAMILTON ENERGY-FROM-WASTE PROJECT (DECEMBER 2014)
PREPARED BY CRA (PROJECT #084692(5)&(6))**

REVIEW OF RESPONSES FROM CRA – 1 APRIL 2015

Dear Matthew;

Port Fuels and Material Services, Inc (PFMSI) and Conestoga-Rovers & Associates (CRA) have provided responses to our comments on the Air Quality Assessment Report (AQAR). We appreciate the effort by PFMSI/CRA to provide clarification to some of our concerns but there are some outstanding items which require further attention as detailed below.

- i. CRA has indicated that they plan to update the AQAR to address a number of issues namely; operating fewer than seven (7) engines although qualitative (Response to Q36) rather than quantitative as well as start-up and shut-down scenarios. The update should be quantitative and include the operation of on-site trucks (including those indoors) as well as other sources of air emissions such as silo vents and comfort heating. In addition, the start-up and shut-down scenarios should also include the operation of the Auxiliary Steam Boiler as indicated in the response to Q12.
- ii. Response to Q14 indicates that the Project will receive 85 trucks (48 large and 37 small trucks) per day but Section 8.1 of the Design and Operations Report suggests that the Project will receive between 30 to 115 waste trucks per day depending on size of truck. It is unclear how the 85 trucks per day was derived. In addition, at 36 tonnes per large truck and 9 tonnes per small truck generates 1080 tonnes/day of waste received which is less than the 1200 tonnes/day indicated in Section 8.1 and suggests a higher number of trucks per day. There is also a discrepancy for the Direct Plasma waste tonnage between Response to Q14 and Section 8.1 which needs clarification. Emissions from other trucks as listed in Section 8.1 do not seem to be accounted for.
- iii. From Response to Q25, the maximum amount of syngas generated will be 17,763 Nm³/hr or 153,586,200 BTU/hr which is equivalent to 45 MW. The syngas will be consumed at the seven engines to generate 20 MW which suggests a 44% conversion efficiency from syngas to power. No confirmation on the amount of syngas to be consumed at a single PFMSI engine or the amount of syngas consumed during the Swindon pilot tests has been provided.



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- iv. CRA has stated in Response to Q22, that "local engine exhaust catalytic control suppliers ... can readily achieve 90% to 95% reduction in CO. We (CRA) have used a 90% control assumption as a reasonable conservative estimate." In the same response, CRA states that "the PFMSI engines will have CO concentrations that are 99 percent lower than the Swindon engine CO concentrations." Further, in the email from Gordon Reusing (2 April 2015), it states that the CO control will be 99.9%. The source testing data from the Swindon engine shows the average uncontrolled CO emissions to be 14,560 mg/Nm³ (13,339 mg/Rm³). At 99% and 90% control, the CO emissions are 133 mg/Rm³ and 1333 mg/Rm³, respectively, which are well above the 40 mg/Rm³ guideline of MOECC A-7. According to the revised Table 1, the CO emissions are shown to be at 13.3 mg/Rm³ which requires 99.9% control. Given the statement from local suppliers that "90 to 95%" control is achievable, meeting the A-7 Guideline for CO is questionable.
- v. The quantity of CO₂e emissions has not been provided, although in Response to Q26 CRA states that the Gasplasma® technology will provide a reduction of -543 kg/tonne of MSW. It is important that the total CO₂e for the Project be quantified and compared to Ontario totals to substantiate emissions. In addition, 700 tonnes CO₂e/yr calculated by Golder are based on 1.5 MMBTU/hr of natural gas for the Thermal Oxidizer as noted in Q23 and not 29 MMBTU/hr as suggested by CRA.
- vi. CRA has acknowledged (Response to Q37) that the background PM_{2.5} concentration is 16.3 µg/m³ while the impact of the Project will be 22.7 µg/m³. Although the Project will meet the MOECC single plant guideline of 25 µg/m³, the cumulative impact with the background level of 16.3 µg/m³, may raise levels above the CAAQS of 28 µg/m³.
- vii. CRA has provided AERMOD input datasets for NO_x and PM_{2.5} emissions which demonstrate a multi-source modelling parameterization was carried out but we have not been able to confirm the output files at this time.

There is still uncertainty in the ability to linearly scale a pilot engine to a full scale production version as little detail is provided on scalability. If this is the first system of its kind, further data are required at a full scale version to provide certainty of success.

If you require further information, I can be reached at 416-366-6999 or via email at aciccone@golder.com at your convenience.

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