

Report on Third Party Verification Services

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City of Richmond
Engineering & Public Works
6911 No. 3 Road
Richmond, BC
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Attention: Mr Levi Higgs, Corporate Energy Manager

Subject: Third Party Verification Services
Concrete & Asphalt Recycling Emission Reductions Project

The City's report, entitled "Concrete and Asphalt Recycling for Roadbase Material Production – City of Richmond Option 2 Project Plan", dated February 2017, (the "Emission Reductions Report") describes and compares the 'Project' emissions, resulting from the production and transportation of the recycled material, with those associated with the 'Baseline' scenario: - the production and transportation of quarried material. The Emission Reductions Report, prepared with the assistance of GHG Accounting Services, presents the results as a calculation of the reduction in Co2 emissions resulting from the recycling of asphalt and concrete waste material into roadbase.

This Third-Party Review Report provides a summary of the findings and conclusions resulting from my provision of 'verification' services related to the City's Concrete & Asphalt Recycling Emission Reductions Project, located at 6711 Sidaway Road, Richmond, BC. My report also briefly describes the work undertaken in developing my findings, and indicates some of the limits to my review and the assurance provided, given the nature of the assumptions involved and the information available.

The report addresses the following project aspects:

- the existence and timing of the recycling project;
- the comparability of the baseline and project cases, and specifically the appropriateness and reasonableness of the project activities included in, or excluded from, the analysis, as described in the City's report;

- the calculations involved in estimating the emission reductions, including the level of assurance reasonably applicable to various assumptions, and arithmetical accuracy.

Existence and Timing of Recycling Activity

I attended the concrete and asphalt recycling operation at Sidaway Road, Richmond on September 7, 2016 and discussed aspects of the operations with representatives of the City's recycling location, the operator/supervisor of the contracted recycling machinery, and GHG Accounting Services.

The operations observed involved an excavator providing waste material from a large pile adjacent to the recycling processor, the processing of the waste material, and the removal by loader of the recycled material to a storage pile close to the recycling machine. This was the third of the equipment configurations used in the recycling project.

Activities Included in the Emission Reductions Comparison

The comparison method aimed to ensure that GHG emission sources, sinks and reservoirs were limited to controlled, material and relevant ones, namely the production of road base material and the transportation of the material to/within the City of Richmond.

In my review, I found that all the activities that warrant inclusion in the project to baseline comparison are included in the analysis. I also found that the activities excluded from the comparison, as described in the report, warranted exclusion. The main examples of such exclusion are emissions related to the demolition and that portion of the transportation of waste material from the demolition site to the recycling site, because these would exist in both scenarios.

The Emission Reduction Calculations

With respect to the emission reduction calculations, the verification work included the following:

- With respect to the baseline case, I confirmed the annual usage of fuel, electricity and explosives, and the average annual tonnage to summary correspondence provided by Mainland Sand and Gravel, the operator of the Cox Quarry;
- For the project case, the tonnes of recycled material are based on actual weights measured by the City;
- For both cases, I was able to confirm distances travelled using GPS information, for both tug/barge and trucking distances, and compare fuel usage assumptions to relevant authoritative sources;
- For both cases, I agreed the emission factors used in the calculations, such as kg of Co₂e per litre of fuel for the production and transportation equipment, to

those stated in the BC Best Practices Guidebook, or to other applicable authoritative sources;

- I have checked the mathematical accuracy of the emission reduction calculations.

As a result of my observations and review of the information provided, the project to baseline comparison, and the resulting emission reductions case, nothing came to my attention to suggest that the reported reduction is not supportable and reasonable for the purposes intended. Please note that I have not performed an audit and this report does not constitute an opinion on the overall emission reduction calculations.

A handwritten signature in cursive script that reads "Davies & Co." with a period at the end.

Davies & Co.
Chartered Professional Accountant
Victoria, BC

March 23, 2017