## PW13.8 Attachment 1

## Attachment 1 – Environmental/Business Case of Renewable Natural Gas

## **Environmental Overview:**

When looking at environmental impacts, two main factors need to be considered, namely upstream (mining/refining/transportation) and downstream (combustion/tailpipe) emissions. Current academic literature estimates that 100% RNG fueled refuse collection vehicles produce approximately 93% less GHG emissions than diesel vehicles. It should be noted that calculating emissions from a large fleet is difficult due to variations in truck model year, seasonal temperature variations, truck operator tendencies, collection routes and amount of garbage collected. Nonetheless, it is possible to develop an overall picture of emissions reductions through RNG utilization. Figure 1 below presents the estimated annual emissions reductions from using 4 million litres of diesel vs. 4 million diesel litre equivalents of RNG (the total RNG production estimate for the Disco Road Organics Processing Facility).



Figure 1: Total GHG Emissions from Diesel vs. RNG

In total it is estimated that utilizing the full amount of RNG production potential from the Disco Road Organics Processing Facility will avoid approximately 13,635 tonnes of GHG emissions each year. Over a 20 year project, converting to RNG would avoid approximately 270,000 tonnes of GHG emissions.

## **Financial Overview:**

In order to assess the economic validity of pursuing Renewable Natural Gas projects a sensitivity analysis was conducted to determine estimated project returns. The sensitivity analysis concerned two different variables, namely (i) the future price of diesel, and (ii) the potential revenue generated from the sale of emissions credits. A high, medium and low scenario was completed for each, the results of which are illustrated in Figure 2. (Please note the sensitivity analysis was developed for the Disco Road Organics Processing Facility - DISCO).



Figure 2: Year over Year RNG Project Return – DISCO Sensitivity Analysis:

The blue line represents the best-case scenario and the grey line represents the worst case scenario. It is likely that any RNG projects at the Disco Road Organics Processing Facility will fall somewhere between these lines. Table 1 below represents the anticipated financial outcomes for each scenario based on a 20 year project.

Scenario	Net Present Value	Internal Rate of Return	Simple Payback
High	\$ 23,643,229	47%	2.1 years
Medium	\$ 17,517,314	43%	2.5 years
Low	\$ 12,146,127	37%	2.9 years

Table 1. Finar	cial Outcomes: