



Palmerston North City Council  
 Att. Mr Philip Burt  
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 New Zealand

Your ref.: PNCC Contract dated  
 22/04/2010

Our ref.:  
 SCCAU987UDDIN100811-1

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 11/08/2010

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## Palmerston North City Council Awapuni Landfill Gas to Electricity Generation Project: Verification of Emission Reduction Units

### 1 AUDIT ARRANGEMENTS

#### 1.1 Scope

Det Norske Veritas Certification AS (DNV) has been engaged to conduct audit procedures associated with verification of the Emission Reduction Units (ERUs) achieved by the Palmerston North City Council Awapuni Landfill Gas to Electricity Project (the "Project") for the calendar year 2009. The project is located in the Awapuni Ward, Palmerston North City, North Island of New Zealand, approximately 150km north-west of Wellington.

DNV has conducted sufficient verification procedures to express an opinion on the following matters:

- The number of ERUs proposed to be verified in respect of the calendar year 2009 have been calculated accurately and consistently in all material respects:
- Based on accurate and reliable electricity generation and LFG records and other relevant supporting documentation.
- In a manner generally consistent with the intent of the monitoring and calculation clauses of the Project to Reduce Emission (PRE) Project Agreement between the New Zealand Government and Palmerston North City Council dated 13 April 2004 and amended Project Agreement 1 dated 3 March 2005, and amended Project Agreement 2 dated 16 February 2010 (the "PRE Project Agreement")..

#### 1.2 Project description

The project comprises of the following components:

- Collection of landfill gas (LFG) from the closed Awapuni Landfill.
- Gas conditioning to remove particulates and moisture.
- Conversion of the LFG to electricity in a Deutz gas engine and alternator set (the "Genset")
- Flaring of the excess or unused LFG captured
- Transformation of the electrical energy to 11kV and connection to the 11kV busbar of the adjacent Waste Water Treatment Plant (WWTP).
- Export of surplus electricity (to the requirements of the WWTP and Recycling Plant) to the main electricity grid.

The landfill gas is metered for temperature, pressure, flow and methane content. Temperature, pressure and flow are measured before gas conditioning and methane content are measured after gas



conditioning. Electrical energy is metered at the alternator terminals and at an import-export revenue meter located at the main connection point of the WWTP busbar to the electricity grid.

The Project has previously completed a successful determination under the New Zealand Projects to Reduce Emissions program (DNV report *DAWES980001:2005* dated 17 May 2005).

Palmerston North City Council (PNCC) has a Power Purchase Agreement (PPA) with Mighty River Power Ltd for excess electricity exported to the grid. In case there is not enough electricity generated from the gas-to-electricity for on-site consumption, PNCC imports electricity from the electricity grid.

### 1.3 Verification procedures

The management of PNCC is responsible for operation of the project. Mercury Energy is responsible for export revenue metering. PNCC is responsible for gas and electricity metering within the project and the WWTP. We have not conducted any audit procedures with respect to the internal control environment of PNCC taken as a whole. As such, no assurance is given on any internal controls not associated with the creation of ERUs.

Our verification has been conducted in accordance with International Standard on Assurance Engagements 3000 *Assurance Engagements other than Audits or Reviews of Historical Information* and according to the New Zealand Government's PRE (Project to Reduce Emission) and to provide reasonable assurance that the ERUs have been calculated in a manner consistent with the PRE Project Agreement. A PRE project's emission reduction verification protocol was adopted and customized to record verification witnessing. Accordingly, we have conducted such tests and procedures as we considered appropriate including:

- Review of the Project Design Document (PDD).
- Review of the calculation spreadsheet Emission Reduction Calc 2009 XL dated 29 June 2010.
- Review of the electricity data claimed as being the data representing the exported electricity to the grid, including the report from the electricity purchaser Mercury Energy Ltd as the retail unit of Mighty River Power Ltd.
- Review of SCADA, STREAM and metering data.
- Review of Annual Report 2009 prepared for the Crown (Ministry for the Environment, New Zealand).
- Review of the Annual Report 2009 prepared for the Austrian JI/CDM Program.
- Site visit to the PNCC landfill sites to confirm the actual facilities were in accordance with the approved project arrangements.
- Discussions with the relevant PNCC personnel.
- Observation and review of relevant documentation.

This report has been prepared for PNCC. We disclaim any assumption of responsibility for any reliance on this report to any person other than PNCC, or for any purpose other than that for which it was prepared.

### 1.4 Verification Findings

Our verification comprised a review of the information contained in the documents described above, with an on-site audit conducted on 27 May 2010. A completed PRE emission reduction verification protocol is attached to this Verification Opinion.



This Verification Opinion was prepared on the basis of the validated PDD and the project facility *as built*. At this onsite audit we found that the

- Arrangements proposed in the PDD had been implemented accordingly.
- Metering of total electricity generation and recording of electricity exported to the grid was in accordance with good practice and provided reliable data.
- Following risk events were experienced with landfill gas supply and electricity generation in 2009.
  - Continued decline in gas quality being drawn off the gas field. This has resulted generating electricity on-off manner for the entire year.
  - An extended gas engine downtime occurred as a result of major head gasket failure during 25 September to 24 October 2009. This has resulted no electricity generation during that period.
- In order to address the risk events, an external consultant has been engaged by PNCC to address the cause of the low gas production and plan to restore gas levels.
- An alternative method was adopted to calculate amount of LFG generated during the period from 24-31 October 2009 as no LFG data was recorded due to changeover of PLC. During this period LFG data was recorded as 'no data'. The adopted calculation method based on the tested energy conversion efficiency of the Genset using default energy content for methane is in accordance PRE Project Agreement and is reasonable.
- The electricity generation during the period was 5.561 GWh. The import from the grid amounted to 0.828 GWh.
- A total of 3 336.80 tonnes CO<sub>2</sub>-e of emission was avoided by the displacement of grid electricity (5.561 GWh).
- A total of 25 627.77 tonnes CO<sub>2</sub>-e of emission reductions was achieved due to flaring of methane (1220.37 tonnes).
- The project emissions due to combustion of methane, import of electricity, and use of transport fuel amount to 3 855.79 tonnes CO<sub>2</sub>-e.

Hence, the total claim for creation of 25 108 tonnes CO<sub>2</sub>-e ERUs during the calendar year 2009 was found, in all material respects, to be fairly stated.

## 1.5 Inherent Limitations

Because of the inherent limitations in any internal control structure it is possible that fraud, error, or non-compliance with laws and regulations may occur and not be detected. Further, the verification was not designed to detect all weakness or errors in internal controls so far as they relate to the requirements set out above as the verification has not been performed continuously throughout the period and the procedures performed on the relevant internal controls were on a test basis. Any projection of the evaluation of control procedures to future periods is subject to the risk that the procedures may become inadequate because of changes in conditions, or that the degree of compliance with them may deteriorate.

The verification opinion expressed in this report has been formed on the above basis.



## 2 VERIFICATION OPINION

In our opinion:

1. The ERUs claimed are additional, as the Project is approved as an additional project activity by the New Zealand Government under the PRE Program.
2. The 25 108 ERUs claimed in respect of the Project for the 2009 calendar year has been fairly and accurately stated and calculated and is:
  - based on accurate and reliable electricity generation data and amount of landfill gas flared records and other relevant supporting documentation; and
  - has been calculated in a manner generally consistent with the intent of the monitoring and calculation clauses of the Project Agreement between the New Zealand Government and Palmerston North City Council dated 13 April 2004, as amended from time to time.

Yours faithfully  
for DNV AUSTRALIA

**Dr Noim Uddin**  
Lead Climate Change Verifier

**Chandrashekara Kumaraswamy**  
Regional Manager  
Climate Change and Environmental Services

**Annex** – Palmerston North Awapuni Landfill Gas to Electricity Generation Project, 2009 Emission Reduction Units Verification Protocol