

Environmental and Social Review Summary

Whein Town Landfill Gas Recovery Project (Liberia)

This Environmental and Social Review Summary (ESRS) is prepared by MIGA staff and disclosed in advance of the MIGA Board consideration of the proposed issuance of a Contract of Guarantee. Its purpose is to enhance the transparency of MIGA's activities. This document should not be construed as presuming the outcome of the decision by the MIGA Board of Directors.

Any documentation which is attached to this ESRS has been prepared by the project sponsor, and authorization has been given for public release. MIGA has reviewed the attached documentation as provided by the applicant, and considers it of adequate quality to be released to the public, but does not endorse the content.

Country:	Liberia
Sector:	Solid Waste Management
Project Enterprise:	Greentech Renewables Ltd.
Environmental Category:	B
Date ESRS Disclosed:	May 23 rd , 2011
Status:	Due Diligence

A. Project Description

Gazprom Marketing and Trading (GM&T) of the United Kingdom has requested MIGA provide political risk guarantees for an upfront payment being made to develop landfill gas recovery at the existing Whein Town Landfill in Liberia (i.e., "project"). The entity carrying out the project will be a newly formed company called Greentech Renewables Ltd. The project consists of the construction and operation of facilities for the capturing and flaring of methane gas at the existing Whein Town Landfill. Flaring methane will transform the methane gas into less potent carbon dioxide, and since the global warming potential of methane is 21 times higher than that of carbon dioxide, the project will significantly reduce the landfill's emissions. The gas collection system will result in carbon emissions reductions that are tradable under Article 12 of the Kyoto Protocol (United Nations Framework Convention on Climate Change, UNFCCC).

The project has been validated and registered under the UNFCCC governed Clean Development Mechanism (CDM) which allows industrialized countries to invest in emissions reductions. This landfill gas (LFG) capture project has been assessed by GM&T as a source of carbon credits under the CDM. The project will be implemented by Greentech Renewables with the support of GM&T, URS Scott Wilson and Greentech Eco Homes.

Whein Town landfill is located approximately 13 km northeast of Monrovia and began operation in June 2008 supported under the World Bank International Development Assistance (IDA)-financed Emergency Monrovia Urban Sanitation (EMUS) Project. The landfill is approximately 25 acres in size and is surrounded by scattered residential settlements and some agricultural activities.

The Monrovia City Corporation (MCC) owns the Whein Town landfill and is responsible for its environmental, health and safety performance. The MCC has contracted out the operations of the Landfill to an independent contractor. Poyry GMBH, a global engineering consulting firm, has been contracted to act as the Design and Supervising Engineer for Whein Town Landfill. LFG capture is currently not occurring at the site. URS Scott Wilson estimated that the landfill receives approximately 350 tonnes per day of municipal waste. It is expected that the landfill will

be operational for another 4 to 5 years, site permitting as it is not viable for continued long-term landfill operations due to site constraints (e.g., availability of additional suitable land).

A Project Design Document (PDD) for the LFG Project was prepared and submitted to the UNFCCC; the first version was publicly disclosed on the [UNFCCC website in 2009](#). Since that time, the project has been validated as part of the CDM process and registered under the UNFCCC. The final PDD calculates that the project activity will generate approximately 936 353 tonnes CO₂ equivalent emission reductions over the ten year crediting period, beginning approximately January 2011 to December 2020.

The scope of the LFG project has been modified since the posting of the PDD in 2009. The modifications have mainly been introduced to reflect that the landfill is actively managed and overseen by the MCC. The LFG project activities include the following components:

- The installation of an active gas collection system and efficient gas flaring system, and
- Use of a dual-fuel generator set for on-site power consumption.

B. Environmental and Social Categorization and Impacts

This project is a Category B under MIGA's Policy on Social and Environmental Sustainability. Whein Town Landfill already exists and is owned by the Monrovia City Corporation (MCC) and operated by a contractor appointed by MCC. Key potential social and environmental impacts and risks of the Whein Town Landfill Gas Recovery Project are related to air emissions, noise and vibration, and workers' and community safety (e.g., fire prevention and control). These potential impacts are largely reversible and readily addressed through mitigation measures. Positive environmental impacts include the capture and flaring of landfill gas which should lead to reductions in open landfill fires and odor nuisance. Proposed mitigation measures have been presented in the Project Design Document submitted under the UNFCCC and in the draft Environmental and Social Management Plan.

C. Applicable Standards

While all Performance Standards are applicable to this investment, MIGA's environmental and social due diligence indicates that the project will have impacts which must be managed in a manner consistent with the following Performance Standards:

- PS1: Social and Environmental Assessment and Management Systems
- PS2: Labor and Working Conditions
- PS3: Pollution Prevention and Abatement
- PS4: Community Health, Safety and Security.

PS 5 on Land Acquisition and Resettlement is not applicable as this project will be implemented at an existing landfill and additional land is not required. People who collect recyclables and other reusable scraps (i.e., waste pickers) are active at this landfill. Typically, waste picking activities occur shortly after garbage arrives at the landfill and before waste is covered with soil ("capping"). It is anticipated that this LFG project will not impact the waste pickers' livelihood as this project can only be carried out once land filling operations within a certain area have ceased and capping of the waste has been carried out.

Issues relating to PS6 (Biodiversity Conservation and Sustainable Natural Resource Management), PS7 (Indigenous Peoples) and PS8 (Cultural Heritage) were not identified by MIGA's due diligence.

Environmental Health & Safety (EHS) Guidelines that are expected to be applicable to this investment include the General EHS Guidelines (April 2007) and the relevant sections of the sector specific EHS Guidelines for Waste Management (April 2007).

D. Key Documents and Scope of MIGA Review

In addition to e-mail correspondence and the Definitive Application, documents reviewed by MIGA include:

- Whein Town Landfill Gas Recovery Clean Development Mechanism Project: Environmental and Social Management Plan (ESMP), prepared by Scott Wilson Limited and Greentech Eco Homes Ltd, dated March 2011;
- Project Design Document (PDD): Whein Town Landfill Gas Recovery Project (Version 02.3), prepared by Scott Wilson Limited and Greentech Eco Homes Ltd., dated 2 November 2010;
- Clean Development Mechanism (CDM) Validation Report: Whein Town Landfill Gas Recovery Project (Version 01.2), prepared by SGS Climate Change Programme, dated 29 June 2010.

MIGA's environmental specialist carried out a site visit in October 2010 to tour the project site, and to meet with local regulatory agencies, the Design and Supervising Engineer for the landfill, the MCC, and the local World Bank office. MIGA also reviewed recent environmental and social assessment and management documentation for the Whein Town landfill (e.g., the Environmental Management Plan), which is available on the [World Bank website](#).

E. Key Issues and Mitigation

PS1: Social and Environmental Assessment and Management Systems

Social and Environmental Assessment and Management: Greentech Renewables and GM&T are committed to developing a systematic approach to managing environmental and social aspects of this project. An environmental and social management plan (ESMP) has been developed for the LFG project. The ESMP describes an appropriate EHS structure of the newly formed enterprise to ensure that the environmental and occupational health and safety risks are managed as part of the overall project activities during pre-construction, construction, operations and decommissioning. A site working plan will be developed that defines the operational procedures and practices related to EHS performance.

Greentech Renewables, as project proponent, proposes to dedicate a percentage of revenue derived from the project activity to fund socio-environmental initiatives which could include:

- The local community – better protection of the local environment as well as support for local businesses regarding benefits of composting, recycling and reprocessing schemes
- The municipal level – capacity building on sustainable waste management practices within MCC
- The national level – assistance with capacity building on climate change and adaptation within the Climate Change Division of the Liberian Environmental Protection Agency.

Organizational Capacity and Training: A CDM operations and maintenance entity (CDM O&M entity) will be appointed by Greentech Renewables to oversee the LFG project's day to day activities. This entity will be required to appoint its own qualified on-site EHS officer prior to commencing any work on site. During construction, the CDM O&M will monitor the construction contractor activities to ensure EHS compliance. During operations, the CDM O&M

entity will also review and monitor procedures and documentation, calculate the emission reductions, and ensure that all requirements for CER verification and certification are fully met.

LFG project activities will be coordinated with the Whein Town landfill owner and operator to ensure that landfill management and operations activities and LFG project activities are compatible. An appropriate protocol of communication will be established and maintained.

All site personnel (including contractors) for the LFG project will receive necessary technical, environmental, and health and safety training prior to commencing activities on site. Training records will be maintained by the CDM O&M and refresher courses will be offered on an as needed basis.

Monitoring and Reporting: LFG contains up to 60% methane, a potent greenhouse gas (GHG) with a global warming potential 21 times greater than carbon dioxide. LFG is released to the atmosphere from the anaerobic decomposition of organic waste. By capturing and flaring the LFG, GHG emissions at the site will be significantly reduced. To ensure effective operation of the LFG capture system, certain indicators of the LFG will be monitored, including temperature, pressure, flow rates and composition. Before any carbon certificates are issued as a result of these measurements, these indicators will be verified by an independent UNFCCC accredited international verification entity termed Designated Operational Entity (DOE) as published from time to time at <http://cdm.unfccc.int>. Such verifications are expected to occur on an annual basis. More detail is provided in the monitoring plan as part of the PDD document.

The ESMP describes the frequency and parameters of the LFG project to be monitored for air quality (including odor and dust), GHG emissions, noise, and occupational health and safety performance. Additional detail will be developed as part of the LFG project's Operations and Monitoring Manual. Environmental and social monitoring reports for the LFG project will be submitted to MIGA.

Although other parties such as contractors and the CDM O&M will be carrying out monitoring, Greentech Renewables will retain overall responsibility as the Supervisory Entity to ensure that the LFG project is meeting its EHS requirements. Greentech Renewables will appoint through the CDM O&M Entity a senior manager for the project to oversee EHS management and performance of the LFG project. The Board of Greentech Renewables will be responsible for reviewing the CDM O&M EHS reporting on a quarterly basis to ensure this is in line with (i) the contractual obligations of the CDM O&M; and (ii) the standards listed above.

PS2: Labour and Working Conditions

The LFG project is expected to employ approximately 10 people during construction and 5 during operations. It is anticipated that 80 % of these positions will be staffed from the local labor pool and remainder will be technical specialists assigned on a short or medium-term to construct and commission the project and to oversee the operations for the first few years.

Greentech Renewables has committed to establishing human resource policies consistent with local laws and PS 2 prior to project activities commencing. The appointed CDM O&M will select a local contractor(s) to construct the LFG project. The contractor(s) will be required to demonstrate full compliance with Performance Standard 2. The form of the contract will incorporate appropriate clauses. Environmental, health and safety training and personal protective equipment will be provided to all personnel employed at the LFG Project site.

PS3: Pollution Prevention and Abatement

Risks from collection, pumping and treating LFG (i.e., risk of fire) will be properly controlled through various equipment and safety precautions incorporated into the capture and flaring equipment. Preventive maintenance of the equipment and proper training of personnel will be implemented. Construction activities will be carried out during daylight hours to minimize noise nuisance from truck traffic and installation of the gas collection and flaring equipment. The diesel fuel for the dual fuel generator set will be stored in a bunded tank equipped with a flame arrester.

In addition to installing enclosed flaring equipment at least 250 m from nearby residences, impacts related to noise and vibration during operations will be reduced by incorporating enclosed acoustic housings for equipment as much as possible. A high temperature, high efficiency combustion system meeting European Union standards will be installed. Equipment will be regularly maintained to ensure its efficiency of greater than 99% burning of gases. Flaring design emissions are in compliance with the requirements of the United Kingdom Environment Agency and with the UNFCCC Annex 13.

EHS performance of the landfill itself is the responsibility of MCC. Leachate is being collected in new ponds and plans are being developed to address improvements within the collection system. Future plans also include fencing of the landfill site and enforcing site access restrictions to authorized people.

PS4: Community Health, Safety and Security

Health and safety analyses will be carried out prior to commencing activities on site. Fire training and emergency response procedures will be put into place and tested before commissioning the LFG project. Firefighting equipment and appropriate signage will be strategically placed around the project site and maintained.

Access to the LFG plant and flare will be restricted and operations will be supervised by trained staff. The LFG capture site will be fenced and guarded (unarmed) to control access.

Any hazardous or potentially hazardous components of the gas plant and flaring system will be removed following decommissioning.

F. Environmental Permitting Process and Community Engagement

An Environmental Impact Assessment (EIA) for the Whein Town Landfill facility was completed in December 2008. Although changes have since occurred in landfill design and dimensions based on what was proposed in the EIA, the EIA did include a small section on landfill gas capture. The LFG project itself does not require an Environmental Impact Assessment (EIA) under Liberian regulations; however a site access permit will be required from the MCC to allow the LFG project activities to be carried out at Whein Town Landfill.

Stakeholder consultation was carried out by Greentech Eco-Homes and URS Scott Wilson for the LFG project in 2008 at Monrovia City Hall and was advertised in the local press prior to the meeting. An Environmental Review was carried out for the project as part of the PDD; this review highlighted the environmental and social impacts and benefits of the project activities and identified potential mitigation measures. The LFG project was disclosed internationally for a 30-day period via posting the first version of the PDD on the UNFCCC website (March 2009). No comments were received. Updated versions of the PDD and the validation report continue to be publicly disclosed on the UNFCCC <http://cdm.unfccc.int/>

Greentech Renewables will continue providing timely information to local communities and other relevant stakeholders by holding meetings on a regular basis. A formal process for receiving and responding to grievances lodged by members of local communities will be established and maintained.

MIGA disclosed its Summary of Proposed Guarantee on April 26, 2011.

G. Availability of Documentation

Find attached to this ESRS the [Project Design Document](#) submitted under the UNFCCC and the draft [Environmental and Social Management Plan](#). Additional information on the project can be requested from:

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