

## Partnership in Action

# Landfill Biogas Project Support in Ecuador

**Presented by** 

Brian Guzzone
U.S. Environmental Protection Agency



Adrian Loening
Carbon Trade Ltd.
(Contractor to EPA)



### **Objectives**



#### Opportunity

- Technical assessments & pre-feasibility studies of selected disposal sites
- Financial impacts and opportunities

### Knowledge

- Disseminate understanding of the potential for landfill biogas capture and use
- Local and practical training (capacity building)

#### Tools

Development of an Ecuador specific Landfill Biogas Model

#### Benefits

- Local and global environmental benefits through development of a landfill gas projects and industry
- Social through skills transfer
- Economic



# Opportunity Stage 1: Assessment Studies



### Objectives of Landfill Biogas Assessment Study:

- Evaluate technical feasibility of landfill biogas capture and use project
- Estimate potential greenhouse gas emission reductions from the project – destruction of landfill methane – and other local air pollutants
- Identify opportunities and constraints
- Recommendations for optimizing biogas collection



# Opportunity Stage 1: Assessment Studies



### Five Landfills have been selected

- Chabay Landfill, Azogues
- El Valle Landfill, Cuenca
- Pichacay Landfill, Cuenca
- Municipal Landfill of Loja
- Las Iguanas Landfill, Guayaquil
- Site Visits took place between 23rd and 28th October



# Opportunity Stage 2: Pre-feasibility Study



- Select the two best sites from the Assessment Studies for Pre-feasibility Study;
- Pump test
  - Purpose is to evaluate biogas extraction rates using partial collection system
  - Extrapolate LFG flows to entire waste volume to estimate current biogas recovery rates from site
  - Results can be used to adjust model estimates
  - Provides useful experience operating system at site
     indicates extent of potential problems with drilling operations and leachate



# Opportunity Stage 2: Pre-feasibility Study



### • The pre-feasibility study will provide:

- Identification of technical constraints for extraction of biogas from the site.
- Allow extrapolation of results to whole site.
- Provide an estimate of the installation and operation costs of gas collection for the site.
- Estimate the investment returns for the project (NPV & IRR)
- Calibrate model estimates of amount of biogas available for recovery
- Provide input data and experience for the development of an Ecuador Landfill Biogas Model.



# Tools Ecuador Landfill Biogas Model



- Develop EPA's first-order decay model Ecuador Landfill Biogas Model
- Allow site owners to develop
  - Good estimates of biogas recovery needed to evaluate project design, size, feasibility and economics
  - Adjustment model to account for waste and engineering of the landfill
- Generate a Landfill Biogas curve
  - Biogas recovery potential maximum recoverable amount
  - Estimated limitations of collection system
  - Comparison to project requirements



## Knowledge Training Program



### Basic Landfill Biogas Training

- Discussion of the results of the Assessment Studies and Prefeasibility studies
- Use of the Ecuador Landfill Biogas Model
- Open to Municipalities and Stakeholders in Landfill Gas Development in Ecuador



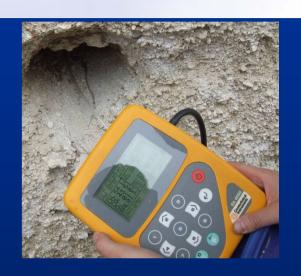


## Knowledge Reporting



# Those sites that were not selected for pre-feasibility studies will obtain:

- Site Assessment Report
  - Delivered to each Municipality
- Training in use of the Ecuador Biogas Model
  - Available on the M2M and LMOP Web Sites
- Basic landfill biogas training program
  - Technical information sharing
- Public Data
  - Reports are publicly available
  - Published on the M2M web site
  - First stop for project developers (investment opportunity)







### **Benefits**



### The M2M Project Will

- Allow Municipalities to understand the technical and economic considerations and potential of their sites.
- Encourage political decision makers to advance projects
- Assist the Development of a Landfill Biogas Industry in Ecuador

 Study data will assist & encourage developers of landfill biogas projects.

#### Move Towards Operating Projects Which

- Create local employment and income
- Reduce local pollution and global emissions of greenhouse gases.



## **Project Timeline**



- August September 06: Collect background data
- October 06: Assessment Study Visits
- November 06: Select sites for pre-feasibility studies (pump test)
- November December 06: Prepare Assessment Reports
  - December January 06: presentation of reports to 4 Municipal Authorities & stakeholders
- January March 07: Design and Implementation of Pump Tests
- April June 07: Prepare report and conclusions and recommendations
  - July 07 Seminar on landfill biogas opportunities, including
    - Reporting of trial
    - Basic landfill biogas training course
    - Presentation of Ecuador Landfill Biogas Model