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Verification Report

Madei Taas Ltd

Initial and first Verification
of the CDM project
"Talia Landfill Gas Recovery and Electricity Production"
in Israel

UNFCCC 000000839

Report No. 982547, Version 2

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TÜV SÜD Industrie Service GmbH
Carbon Management Service
Westendstr. 199 - 80686 Munich - GERMANY

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Subject:	Initial and First Periodic Verification of a CDM Project
Executing Operational Unit:	TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 – 80686 Munich, Federal Republic of Germany
Client:	Madei Taas Ltd. 21 Hamelach st. Park Afek Rosh Aayn- 48091 - Israel
Contract approved by:	Werner Betzenbichler
Report Title:	Initial and first Verification of the CDM project "Talia Landfill Gas Recovery and Electricity Production" in Israel
Number of pages	27 (excluding cover page and annexes)

Summary:

TÜV SÜD Industrie Service GmbH has performed a initial and first verification of the CDM project: "Talia Landfill Gas Recovery and Electricity Production" in Israel. The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords".

The management of Madei Taas Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the "Talia Landfill Gas Recovery and Electricity Production" project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD version dated 4th December 2006, which was registered. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the project.

The verifier confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project generates GHG emission reductions. Four Forward Action Requests have been identified, which the project team will need to consider for assuring the reliable quantification of GHG emission reductions.

The verifier can confirm that the GHG emission reduction for the whole monitoring period is calculated without material misstatements. Additionally the verifier confirms that the monitoring plan is in accordance with the methodology ACM0001 version 4 applied for the project. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: from March 11, 2007 to December 31, 2007.

Verified emission in the above reporting period:

Emission Reductions: **21133 t CO_{2eq}**

The verification team also determined some few areas of risks for the project in the context of the management / operation system and of quality assurance. Issues indicated as "Forward Action Request" should be submitted as indispensable information to the verification team of the next periodic verification.

Work carried out by:	**Internal Quality Control by:**
• Martin Schröder (ATL) • Werner Betzenbichler (GHG Auditor) • Dr. Albert Geiger (GHG Auditor)	Javier Castro

Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CR	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
JI	Joint Implementation
KP	Kyoto Protocol
MP	Monitoring Plan
NGO	Non Governmental Organization
PDD	Project Design Document
TÜV SÜD	TÜV Industrie Service GmbH TÜV SÜD Group
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

Madei Taas Ltd. has commissioned an independent verification by TÜV SÜD Industrie Service GmbH (TÜV SÜD) of its CDM project: "Talia Landfill Gas Recovery and Electricity Production" in Israel

Verification is the periodic independent review and ex post determination by the Designated Operational Entity / Independent Entity of the monitored reductions in GHG emissions during the defined verification period.

- **Initial Verification**: The objective of an initial verification is to verify that the project is implemented as planned, to confirm that the monitoring system is in place and fully functional, and to assure that the project will generate verifiable emission reductions. A separate initial verification prior to the project entering into regular operations is not a mandatory requirement.
- **Periodic Verification**: The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; furthermore the periodic verification evaluates the GHG emission reduction data and express a conclusion about whether the reported GHG emission reduction data is "free" of material misstatements; and verifies that the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records. If no prior initial verification has been carried out, the objective of the first periodic verification also includes the objectives of the initial verification.

The verification shall consider both quantitative and qualitative information on emission reductions. Quantitative data comprises the monitoring reports submitted to the verifier by the project entity. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification follows UNFCCC criteria; refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

The objective of the current service provided to Madei Taas Ltd has been the Initial and First Periodic Verification.

1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions. The verification is based on validated project design document including baseline. These documents are reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of CERs.

The verification is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the audit team performing the verification have to cover at least the following aspects:

- Knowledge of Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Skills in environmental auditing (ISO 14000, EMAS)
- Quality assurance
- Technical aspects of power generation
- Monitoring concepts
- Political, economical and technical random conditions in host country

According to the technical scopes and experiences in the sectoral or national business environment TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy". The composition of an assessment team has been approved by the Certification Body ensuring that the required skills are covered by the team. The Certification Body TÜV SÜD operates four qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL)
- Greenhouse Gas Auditor (GHG-A)
- Greenhouse Gas Auditor Trainee (T)
- Experts (E)

It is required that the sectoral scope linked to the methodology has to be covered by the assessment team. The verification team was consisting of the following experts (the responsible Assessment Team Leader in written in bold letters):

Name	Qualification	Coverage of technical scope	Coverage of sectoral expertise	Host country experience
Martin Schröder	ATL		☑	☑
Werner Betzenbichler	GHG-A, E	☑	☑	
Dr Albert Geiger	GHG-A, E	☑	☑	☑

According to these requirements TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy":

Werner Betzenbichler is head of the department Carbon Management Service of TÜV SÜD and head of the "Certification Body for Climate and Energy" and expert for conventional energy generation, renewable energy, energy expansion planning and familiar with the recent version of CDM and JI criteria as necessary for the implementation of Art. 6 and Art. 12 of the KP. Since 2000 he has been working in the international climate change and emissions trading business as a verifier.

Martin Schröder is appointed as Assessment Team Leader and GHG-Auditor by the certifcation body "climate and energy". He holds a Masters Degree in forestry and passed successfully internal training schemes in the field of auditing as well as the relevant technical specifications of landfill projects. Before entering the company, he worked on development projects in the Amazon Region and managed voluntary carbon offset projects.

Dr. Albert Geiger is an auditor for environmental management systems at the department "Carbon Management Service" in the head office of TÜV SÜD Industrie Service GmbH in Munich. He is specialised in environmental issues, among others related to landfill management.

In order to have an internal quality control of the project, a team of the following persons has been composed by the certification body "climate and energy":

- Javier Castro (Certification Body "Climate and Energy")

1.3 GHG Project Description

The purpose of the project is to extract landfill gas from an existing landfill and uses its methane content for energy production. The project is located in the Jordan Valley near the agriculture community Menahamia. The Talia landfill site was established in 1977 by the 5 municipal authorities. The site was closed by 31.12.1999.

There are two complementary activities reducing greenhouse gases in the project: a) Collection and controlled combustion of landfill gas, converting CH4 emissions into CO2 and therefore reducing its greenhouse effect, and b) using landfill gas as an alternative fuel. The power is delivered to the national grid where it replaces power generated from fossil fuels. The project baseline is the continued practice of uncontrolled and unlimited release of landfill gas (CH4) to the atmosphere. The usage of fossil fuel (according to the carbon intensity of the national grid) for power generation.

Project participants are Madei Taas Ltd from Israel and Kommunalkredit from Austria.

The project starting date is 1 October 2006 and the start of the 7 year renewable crediting period is the point of time at registration. The expected operational lifetime is 21 years.

The project has been registered as a CDM activity on 11 March 2007 and has the reference number 0839.

2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual, an initiative of all Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a verification protocol was customized for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM/JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been proved and the result of the verification.

The verification protocol consists of four tables. The different columns in these tables are described in Figure 1.

The completed protocol is enclosed in Annex 1 to this report.

Figure 1 Verification Protocol Tables

Initial Verification Checklist			
OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*Description of circumstances and further commendation to the conclusion.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications*

Periodic Verification Checklist Table 1: Data Management System/Controls		
Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	A score is assigned as follows: **Full** all best-practice expectations are implemented. **Partial** a proportion of the best practice expectations is implemented **Limited** this should be given if little or none of the system component is in place.	Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (**OK**)**,** or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications

Periodic Verification Checklist Table 2: GHG calculation procedures and management control testing		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
Identification of potential reporting risks based on an assessment of the emission estimation procedures. Identification of key source data. Focus on those risks that impact the accuracy, completeness and consistency of the reported data.	Identification of the key controls for each area with potential reporting risks. Assessment of adequacy of the key controls and eventually test that the key controls are actually in operation. Internal controls include, Understanding of responsibilities and roles, Reporting, reviewing and formal management approval of data; Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc.	Identification of areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks Areas where data accuracy, completeness and consistency could be improved are highlighted.

Periodic Verification Checklist Table 3: Detailed audit testing of residual risk areas and random testing		
Areas of residual risks	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *FAR*s)**
List of residual areas of risks of Periodic Verification Checklist Table 2 where detailed audit testing is necessary. *In addition, other material areas may be selected for detailed audit testing.*	*The additional verification testing performed is described. Testing may include:* ▪ *Sample cross checking of manual transfers of data* ▪ *Recalculation* ▪ *Spreadsheet 'walk throughs' to check links and equations* ▪ *Inspection of calibration and maintenance records for key equipment* ▪ *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions are noted here. Errors and uncertainties are highlighted.*

2.1 Review of Documents

The verification was performed as a desk review of the project documents including PDD, monitoring plan, validation report, Monitoring Manual, draft monitoring report and further documentation. A complete list of all documents reviewed is attached as Annex 2 to this report.

For the first periodic verification a draft version of the Monitoring Plan was published on the UNFCCC webpage ahead of the site visit.

2.2 Follow-up Interviews

On 26-27 March 2007 TÜV SÜD performed interviews with project stakeholders to confirm selected information. Representatives of Madei Taas Ltd and the landfill operating staff were interviewed. The main topics of the interviews are summarized in Table 1.

The site visit in the context of the regular first periodic verification was carried out the 12. February 2008.

Table 1 Interview topics

Interviewed organization	Interview topics
Madei Taas Ltd	➢ Project design and implementation since validation ➢ Technical equipment and operation ➢ Monitoring plan ➢ Monitored data ➢ Data uncertainty and residual risks ➢ GHG calculation ➢ Quality assurance and quality control ➢ Data transfer and reporting procedures ➢ Data archiving ➢ Environmental impacts ➢ Compliance with national laws and regulations

2.3 Resolution of Corrective and Forward Action Requests

The objective of this phase of the verification was to resolve the requests for corrective actions and any other outstanding issues which needed to be clarified for TÜV SÜD`s positive conclusion on the GHG emission reduction calculation. The Clarification Requests (CR) and Corrective Action Requests (CAR), raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. Forward Action Requests (FAR) are indicated issues which do not effect the generation of emission reduction in the verified period, but shall be improved in order to ensure the reliability of future data. To guarantee the transparency of the verification process, the concerns raised and responses that have been given are summarized in chapter 3 below and documented in more detail in the verification protocol in Annex 1.

3 VERIFICATION FINDINGS

In the following sections the findings of the verification are stated. The verification findings for each verification subject are presented as follows:

The findings from the desk review of the final monitoring report and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Verification Protocol in Annex 1.

1) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Clarification or Corrective Action Request, respectively, has been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Annex 1.
2) Where Clarification or Corrective Action Requests have been issued, the exchanges between the Client and TÜV SÜD to resolve these Requests are summarized.
3) In the context of Forward Action Requests, risks have been identified, which may endanger the delivery of high quality CERs in the future, i.e. by deviations from standard procedures as defined by the MP. As a consequence, such aspects should receive a special focus during the next consecutive verification. A FAR may originate from lack of data sustaining claimed emission reductions. Forward Action Requests are understood as recommendation for future project monitoring; they are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Annex 1
4) The final conclusions for verification subject are presented. The verification findings relate to the project implementation as documented and described in the final monitoring report.

Initial Verification Findings

3.1 Remaining issues from validation

3.1.1 Discussion

Based on the validation report the verification team identified no missing steps.

The project has been registered under the CDM on 11 March 2007 under the reference number 0839. The verification has been carried out based on the final, registered PDD.

3.1.2 Findings

It has been noted that Landfill gas from neighbouring landfill site Hagal (not part of project boundary) will be used in the engine installed by the Talia project. This is a special aspect of the project. In the PDD it is highlighted that the project activity regarding methane emissions reduction is limited to the Talia site. Landfill gas from Hagal is used only for power generation.

The Methane destroyed per year is to be calculated as follows:

$MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$ - Methane delivered from the Hagal field

Explanation: The values for temperature and pressure are taken from the input of the Talia site.
For cross reference the amount of methane from Talia - amount of methane form Hagal will be compared with the amount of methane flared and methane combusted in the engines.
The value of whatever is lower will be considered as the conservative volume for the methane emission reduction from the Talia site.
The complete methane input from the Hagal site will be deducted from the amount of methane combusted in engines and flare at the Talia site.

3.1.3 Conclusion

The project complies with the design indicated in the PDD.

3.2 Project Implementation

3.2.1 Discussion

The project has been implemented as defined in the PDD and there is no change in the major equipments. As indicated and described, an engine and enclosed flare system was installed. The corresponding metering system has been reviewed during the onsite visit on 26 March 2007.

Also the capturing system of the landfill gas was reviewed. The auditors have been informed that the Talia site at the time of the first site visit was providing about 750 m3 of LFG / hour (estimate). The validated amount was about 940 m3 / h for the Talia site. The generator was working (caterpillar gas engine). The flare was also encountered fully functional.

The following components have been visited:

- 37 wells on the Talia site

- Pipeline to generator, aprox. 400 m
- Cooler
- Caterpillar motor and generator
- Enclosed flare

Monitoring equipment have been found in line with the corresponding flowchart. Consistency with the PDD and the Monitoring Plan exists (compare Monitoring plan and plant overview).

3.2.2 Findings

Forward Action Request 1:

For the periodic measurements of the methane in the exhaust gas a portable device is used. The maximum accuracy of +/- 0,5 % of the device needs to be considered (in Emission Reduction Calculations).

The device should also be considered for (field) calibration.

Consider to use a measurement system that indicates ppm of methane in exhaust gas (e.g available in disposable form).

Response:

18.4.2007

Clear and accepted, see Yearly journal and Maintenance template, to be filled.

Auditor:

Consistency of accuracy of methane analyzer with values to be measured in exhaust gas needs to be made sure. See initial comment. Current device is considered inappropriate for PPM indications. Potentially check, e.g. the firm Bacharach as provider for disposal measurement devices with ppm precision.

20.5.2007

Under processing in cooperation with Mr. Koch.

Auditor:

By April 2008 and with delivery of the first Monitoring Report at the first regular verification FAR 1 has been closed. Compare pages 5-10 in the Monitoring Report.

Forward Action Request 2:

The structure / format / final layout of the main daily monitoring sheets and the monthly aggregation remains to be defined and submitted in its final version (in line with scheduled reading procedures)

The template to be used needs to be in full consistence with requirements of the Monitoring Plan for each parameter (e.g. continuous reading, electronic and paper): 1-3 (LFG), 5 (flame temp.), 6 (W_{CH4}), 7 (T), 8 (P), 9 (El_{ex}),10 (El_{imp}) (and for Hagal:) 16 (LFG), 17 (Pres), 18 (Temp), 19 (CH4 in LFG).

Note that for 9 (El_{ex}),10 (El_{imp}) metering / reading is considered necessary for crosschecking the data as provided by the utility.

Furthermore the template and reporting needs to consider: i) operating hours of the flare and ii) operating hours of the engine.

The final layout that will be used (and that is in line with data provided by the PLC) shall be submitted to the auditor.

If the draft version of the template for manual readings (Plant Operations Journal) is used in any form (e.g. for crosschecks / as part of a procedure if the PLC fails / to complement data that is not available via PLC) include clear labeling of the meters. An updated version of the template shall be made available.

Response

18.4.2007

The project documents and templates, updated according to your request and attached.

Explain, if you insisting on including of the i) operating hours of the flare and ii) operating hours of the engine, in line with data provided by the PLC?

Auditor:

Daily Journal (hardcopy) considered consistent with Monitoring requirements. As analyzed on-site it is scheduled to streamline the PLC data with the monitoring plan / format presented. Operating hours of flare and engine should be recorded (possibly also calculated)

20.5.2007

The technical solution of directly streamline data or calculation, according to Flare gas temperature and Export electricity totalising still under investigation of Mr. Koch. Until fixing of the issue by electronically recorded data, the above data recorded manually from electronic counters of the flare and engine.

Auditor:

By April 2008 and with delivery of the first Monitoring Report at the first regular verification FAR 2 has been closed. Compare pages 6-10 in the Monitoring Report.

Forward Action Request 3

The consistency of data series for emission reduction calculation before and after the modifications on metering installations (methane analyzer / blower) need to assured at first periodic verification. (FAR4).

No response provided / necessary as this FAR is a result of CAR 2

Auditor:

By April 2008 and with delivery of the first Monitoring Report at the first regular verification FAR 3 has been closed. Compare pages 6-10 in the Monitoring Report.

Corrective Action Request No 1

The flow chart of the metering system should be brought to consistency in its labeling of the individual meters (3 letter code) with the Plant Operations Journal / Data Sheets generated by the PLC.

Consider also to include the serial numbers of the meters to the flowchart

Response

18.4.2007

The flowchart under development according to your request , and will be advised ASAP

Auditor:

Overview flow chart remains. Please correct serial number on F2H and F2T in Plant Maintenance Plan.

20.5.2007

Attached flow chart.

Auditor:

Flow chart in English received. Serial numbers in Maintenance Plan have also been corrected.

Corrective Action Request No 2

For the methane analyzer, background documentation and calibration has been provided for one device. In the flowchart two devices are indicated (Hagal-BOH/ Talia-BOT). Complete calculations on CH_4 mass are necessary for Hagal also in order to calculate the Emission Reductions for Talia. Thus, further clarification on CH_4 metering is requested.

Furthermore, the CH_4 analyzer is positioned after LFG capture on site and ahead of the blower. The blower is considered to potentially cause additional air input (if not a closed system). Further clarification is requested.

Response:

18.4.2007

Recheck, provided for you on CD certificates for two devices : s/n 0515 and 0516, in fact two devices installed, and photographed by you.

The gas analyzers installed after blowers, so additional air input from blower controlled by CH4 and O2 monitoring, and if O2 above 10%, the blower trip.

Auditor:

Calibration certificate of device 516 was not included, only testing sheets. Please complement.

20.5.2007

Calibration Certificate attached.

The primary analyzers were installed after blowers, but on later stage, according to requirement of EHEIM, location of analyzers was changed, ahead of the blowers.

For clarification of prevention of potentially cause additional air input, we can to provide report of pressure test of piping.

Auditor – 15.7.2007

The confirmation of changes in the monitoring architecture (blower, methane analysis at both sites, flow meters) was submitted

Corrective Action Request No 3

In regard to the flow meters of the landfill sites, the secondary documents provided indicate that they are to be used for atmospheric pressure. The blower installed ahead of the flow meters (F2H, F2T) nonetheless increases pressure above these levels. Further clarification on this aspect of consistency is requested.

Response:

18.4.2007

Further clarification on this aspect of consistency is requested

Auditor:

Item was related to pressure pot. generated by blower. It is highlighted that we refer to consistency between blower (that might produce increased pressure) and subsequent flow meter (operation parameters indicate pressure from 70-100 mbar). Here it needs to be clarified if the blower does produce values beyond that range indicated for the flowmeter.

Thus please indicate the details of the blower in regard to pressure and potential additional air input that could inflate the metered amount of gas.

20.5.2007

The sum of gauge gas pressure, measured by pressure transmitters, and barometric absolute pressure, measured by gas analyzers, give possibility to calculate pressure correction factor in formula of CH4 actual density.

D ch4=0.0007168*(Pabs barometric + Pgas)/Pabs barometric std)*(273.15 [K]/ T gas [K]), where P abs barometric std=101.3 kPa (or 1013 hPa, as measured and calculated in our system.)

Corrective Action Request No 4

Regarding the flare system, a secondary gas pipeline (EV01) is installed that leads to the exhaust of the flare (without burning). As the flow meter is installed ahead of the separation of the gas pipes, it needs to be clarified how it is assured that it is not accounted for Emission Reductions via flaring that are actually not burned.

Response

18.4.2007

The EV01 is solenoid for ignition of flare on start only, controlled by PLC.

The EV01 (line) is normally closed, and when the solenoid opened for short time, gas, passed via the line ignited by spark plug, and after start of operation of flare, the EV01 immediately closed, or after proving of flame, or by timer.

So, situation, when LFG coming via EV01 and not burned is not possible (except of summery of number of failures, but this failure situation will be noted in report)

Corrective Action Request No 5

Calibration: A concrete maintenance plan needs to be developed that includes i) initial calibration status and ii) the upcoming calibration necessities of each meter and corresponding responsibilities over time (as an applicable procedure for onsite use).

Response

18.4.2007

See attached maintenance templates and documents.

Auditor: Consider to include concrete dates for upcoming calibrations, especially methane analyzer (each 3 months) in order to avoid troubles with outdating,

20.5.2007

The revised maintenance plane attached.

Auditor: Material was printed, checked and taken to files.

Corrective Action Request No 6

The calibration for temperature and pressure transmitters remain to be made available.

Response

18.4.2007

Clear and accepted, see template of Maintenance journal submitted.

Auditor: Material was printed, checked and taken to files.

Corrective Action Request No 7

In addition and as update to the draft Plant Operation Journal (see also 3.3.) a concrete procedure / Monitoring Manual with a schedule (daily / monthly / yearly) on monitoring and reporting requirements for each parameter remains to be elaborated (for onsite use).

Response

18.4.2007

See monitoring journals and manual

Auditor: Document reviewed and considered satisfactory.

Corrective Action Request No 8

It shall be considered to include the indications in regard to failure of monitoring devices as described in the PDD to a separate procedure / Monitoring Manual for onsite use.

Response

18.4.2007

See attached monitoring journals and manual and maintenance journal.

Auditor: Document reviewed and considered satisfactory.

3.2.3 Conclusion

The project complies with the design indicated in the PDD.

Methane analysis in exhaust gas and accuracy of currently used device inappropriate and requires the use of appropriate analysis technique. (FAR1)

Hardcopy record keeping is considered adequate. Streamlining of recording with PLC remains in process (FAR2).

3.3 Internal and External data

3.3.1 Discussion

The data from flow meters, metering of landfill gas composition as well as flare temperature and generator operation is monitored continuously and compiled in a central computer system. Complementary data such as methane content in exhaust gas is measured manually.

3.3.2 Findings

Forward Action Request 4

It remains unclear how the amount methane from Talia destroyed via flaring is calculated exactly. (compare statement included in D.2.4 and NIR 4 of validation report).

An example on the concrete calculations of the project's Emission Reductions shall be submitted to the auditor (e.g. for the first month based on an Excel Spreadsheet).

Response

18.4.2007
To be advised ASAP.
Auditor:
The exercise to actually calculate the emission reductions (apply PDD formulae) should be done as early as possible. Item was discussed with Mr. Koch and remains pending.

Auditor:

By April 2008 and with delivery of the first Monitoring Report at the first regular verification FAR 4 has been closed. Compare pages 5-10 in the Monitoring Report.

Corrective Action Request No 9

The following data needs to be provided:

- Technical specifications of electricity meter for Import / export.

Response

18.4.2007
Technical specification of the electrical meters PM172EH available on the link
http://www.mbcontrol.com/satec_prod.html
The operational manual copied to CD have been sent to you.
Auditor:
Material was printed, checked and taken to files.

Corrective Action Request No 10

In order to sustain (in addition to meter readings) the monthly export and import of electricity to the grid, the monthly electricity invoices need to be available for verifications:

i) for bought energy.
ii) for sold energy.

In line with requests on the update of the Operations Journal (3.7.), it shall be confirmed / clarified who has the responsibilities to gather corresponding documents and where they are stored (compare also p.45 of PDD).
Furthermore, the invoices for February or March 2007 shall be made available.

Response

18.4.2007

clear and accepted, see also attached documents.
Auditor:
Make sure to hold initial invoices (February or March 2007).
20.5.2007
Attached monthly reports March, April 2007
Auditor: Document reviewed and considered satisfactory.

3.3.3 Conclusion

The project complies with the requirements.

Due to the special design of the project with two related landfill sites, the actual calculation of Emission reduction is important and will be further analyzed at regular periodic verification (FAR3) .

3.4 Environmental and Social Indicators

3.4.1 Discussion

Page 49 of the PDD defined environmental and social aspects as part of the monitoring plan.

3.4.2 Findings

The required monitoring in regard to the impact on birds as well as payment and medical care of employees is carried out.

3.4.3 Conclusion

The project complies with the requirements.

3.5 Management and Operational System

3.5.1 Discussion

The necessary procedures have been defined in the PDD and in additional internal documents relevant for the determination of the electricity exported to the grid. The allocation of responsibilities is documented in a written form as described above. Routines for the archiving of data are defined and documented.

3.5.2 Findings

None

3.5.3 Conclusion

The project complies with the requirements.

Periodic Verification Findings

3.6 Completeness of Monitoring

3.6.1 Discussion

The reporting procedures reflect the monitoring plan completely. The monitoring data gathered manually on paper as well through a PLC unit for daily record keeping.

All flow metering has occurred according to the requirements of the Monitoring Plan, same applies to the methane content measurements. The proofs of generator operation and net electricity export have been found compliant with the monitoring plan. The flare operation was continuously monitored through flame temperature controller, periodic measurements of CH4 in the exhaust gas were carried out, and the flare was operated according to the specifications of the manufacturer. Compare Annex 1 for further details.

No deviations from the registered Monitoring Plan were necessary.

3.6.2 Findings

Corrective Action Request No.1

The monitoring Results for FE, AF (due to regulations) and EFgrid remain to be incorporated to the Monitoring Report in section B.2.2 (instead of B.2.1 /defaults)

Response:
Was adapted in revised version of MR.
Auditor:
Section B.2.2 in considered to include all parameters and data as requested by the registered Monitoring Plan.
FE was calculated and included.
EF grid was updated and included. The used value of 0,000785 t CO2 / kWh has been validated and is considered to be conservative.

AF monitoring was included and is set zero.

Corrective Action Request No 2

Please indicate in the MR for the baseline as well monitoring methodology the correct version number applied (both, for ACM 0001 and I.D; section A.5 of MR)

Response:
Corrected in the revised MR draft 3.
Auditor:

Version numbers are included as per registered PDD.

Corrective Action Request No. 4

Assure consistency and clear indication of last calibration event in the included table (B.1), respectively submit remaining calibration documents (temp, pressure). Clarify the calibration requirements for electricity meters.

Response:
Corrected in the revised MR draft 3
Regarding electricity meters, according to recommendations and statement of the manufacturer, Satec, the meters are calibrated for life, and periodically calibration isn't required (attached approving letter)

Regarding the thermocouple, used for flare temperature indication, periodically calibration of the TC isn't required.
Auditor:

Calibration of all meters is documented adequately and in line with the requirements of the registered monitoring plan.

Corrective Action Request No. 5

The EF of the Isreal grid should be updated in line with the annual monitoring requirement.

Response

The grid factor was updated from 2005 to 2006, as the most recent data available.
Auditor:

The data was updated. The used value of 0,000785 t CO2 / kWh has been validated and is considered to be conservative.

Corrective Action Request No. 6

In section B.3.2, the emission reduction are considered baseline emissions (to be erased at this position). Section D.3.4 should include a clear overview of the claimed Emission reductions from Methane destruction and net electricity exported.

Response:

Corrected in the revised MR draft 3.
Auditor:

Phrasing was changed and overview on emission reductions included.

Corrective Action Request No. 7

Include in the Monitoring Report a table (or adapt existing ones) that clearly indicates the result / number (if applicable average) for each parameter as defined by the registered monitoring plan (in PDD / D.2.21).

Note as of EB 28: "All of the monitoring parameters required by the registered monitoring plan are reported by the project participants at the intervals required by the registered monitoring plan, all data is contained in the monitoring report, and the report has been supplied in an assessable format."

Response:

The collected data attached to the MR.
Auditor:
The intention of the request was that one single overview table with main metering results in line with the registered monitoring plan (complementary to list of variables in B.2.2) is included to the MR.
The complete set of actual metering data was included as Annex. Hence, all main results are included to the Monitoring Report, partly in separate sections.

3.6.3 Conclusion

The CARs issues have been closed. Additionally all the parameters used for the emission reduction calculations are presented in the monitoring report. The required frequencies in measurement were complied with.

The project complies with the monitoring requirements as defined per registered monitoring plan and the methodology.

3.7 Accuracy of Emission Reduction Calculations

3.7.1 Discussion

The audit team confirms that emission reduction calculations have been performed according to the requirements of the Monitoring Plan and to the calculation methodology reported in the Monitoring Report.

The calculations are considered conservative, among others due to the applied discounts for metering errors calculated based on the defined meter accuracies. In the field of electricity production conservativeness was underlined by choosing the lower value between actual data recording the data confirmed through electricity bills (as defined in the monitoring plan).

In regard to the position change of the methane analyzer (from before blower to in-between blower flow meter) and the initially discussed possibility of additional air being introduced to the system by the blower (change on installation on 11th of July 2007), the project participant has demonstrated that changes in mean CH4 content before and after the change are minimal (1%). However, in order to underline conservativeness, the CH4 content accounted for before the installation change were capped at the lower end of the of 95 % confidence level of the mean. This approach is considered conservative.

3.7.2 Findings

Corrective Action Request No. 3

Flare efficiency remains to be calculated considering the relation between the average methane content of the LFG to be destroyed and the remaining methane content in the exhaust gas (0,5% acc. to meter accuracy). Update also formula in Section D.1 of MR.

Response

Corrected in the revised MR draft 3, and updated in the Summery excel sheet

Auditor:

The flare efficiency was initially calculated considering metering accuracy of 0,5%. Further measurements posterior to the end of monitoring period by an approach with higher accuracy (not considered).

The default for enclosed flares of FE= 90% was applied due to the fact that it was not possible to actually calculate the necessary air-ratio based on the measurements carried out. The metering carried out (Flame temperature, flare operation, CH4 in exhaust gas, operation according to specifications of manufacturer), allows for the application of the default as foreseen by the methodology.

Corrective Action Request No. 8 (newly added 13 August)

As defined per Request of Review:
The PDD (p 15) stated that "The project activity regarding methane emissions reduction is limited to the Talia site." However, in the calculation of the emission reduction, the PP applied the methane destruction of 839.172 tCH4 on the total quantity of methane for flaring and electricity generation and methane destruction in Hagal rather than the application of the measured amount of LFG of 833.158 tCH4 only from Talia landfill. Further clarification is required.
PP Response:
The PDD (p15) stated, that "The project activity regarding methane emissions reduction is limited to the Talia site. Landfill gas from Hagal is used only for power generation."

After applying of the missed measurements errors correction of mass calculation of MD flared.y and MD electricity.y, the corrected calculation of Methane destroyed per year: MD project,y= MD flared,y+ MD electricity,y - Methane delivered from the Hagal field
(MDproject,y= 251.629 + 1217.624 - 664.054=805.199 tCH4)
Where MD flared.y is flared quantity of methane, corrected by 90% Flare efficiency

DOE Response:
In the previous version of the Monitoring Report errors were calculated and considered for the metering of the methane flow of the meters in from the landfill site Hagal and Talia (Mass CH4 Landfill [tonn]), as well as for the electricity metering. Errors for the flow meters installed in front of the generator and the flare were not considered. A mismatch in error consideration emerged. The latter contributed to the fact that calculated values for methane destroyed (MDproject, y) exceeded the actually measured amounts of methane from Talia.
The revised version of the Monitoring report considerd the errors for the metering of Mass CH4 Generator [tonn] and Mass CH4 Flare [tonn]. This leads to a total amount of methane destroyed (MDproject, y) that is lower than the amount of Methane measured from the Talia landfill. Therefore, the audit team considers that the use of the adapted values of MD project, y of 805.199 tCH4 is conservative in comparison to the actually measured amount of LFG of 833.158 tCH4 from Talia landfill.

3.7.3 Conclusion

The project complies with the requirements as per registered Montoring Plan and methodology.

3.8 Quality of Evidence to Determine Emission Reductions

3.8.1 Discussion

Concerning verification the calculation of emission reductions is based on internal data (the external data e.g on GWP for CH4 is obtained from IPCC). The origin of those data was explicitly checked.

Consistency between actual record keeping in writing and on paper and the data gathered by the PLC unit was confirmed. All equations and algorithms used in the different spreadsheets were checked. Further on, entering and processing of those data in the corresponding Excel sheets was checked, where predefined algorithms compute the monthly value of the emission reductions base. Metering data is then aggregated to the annual level, respectively processed in line with the monitoring period.

Inspection of calibration and maintenance records for key equipment was performed.

The observations of the auditing team left no doubt that the monitoring process was followed as defined in the registered PDD and requested by the corresponding methodology (version).

3.8.2 Findings

Forward Action Request No. 1

It is considered relevant, that calibrations are outsourced to a third party from time to time. At least each third calibration for the relevant meters where Madei Taas is calibrating (while complying with relevant requirements) should be done by another company.

3.8.3 Conclusion

The project complies with the requirements.

3.9 Management System and Quality Assurance

3.9.1 Discussion

The management of the project is in hands of Madei Taas Ltd. The company is specialized in monitoring, which in underlined by the impression that a well developed technical approach on metering has been installed.

Due to the fact that the registered monitoring plan foresees the twofold approach on data readings between "manually on paper" and electronically, the general data availability is an over average level. The latter contributes to data security and minimizes the risk of data gaps.

Local readings are carried out by the staff on the site. Extraction and processing of electronic data is in hands of a metering expert of Madei Taas.

Due to the straightforward approach for calculating GHG emission reductions the existing management system is appropriate and quality assurance is guaranteed. There are some areas where improvement was needed; those are listed in sections above.

3.9.2 Findings

None

3.9.2 Conclusion

The project complies with the requirements, assuming appropriate handling of the FARs in the ongoing verification period.

4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	Measurement of data is done appropriately. All FARs issued at the initial verification have been closed.

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Emission Reductions	
	Data calculations	✓	✓	✓	Data calculation is consistent and traceable.
	Data management & reporting	✓	✓	✓	A data management system is in place.
Consistency	Changes in the project	-	-	-	There are no changes in the project during the monitoring period.

5 VERIFICATION STATEMENT

TÜV SÜD Industrie Service GmbH has performed a initial and first periodic verification of the CDM project: "Talia Landfill Gas Recovery and Electricity Production" in Israel. The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords".

The management of Madei Taas Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the "Talia Landfill Gas Recovery and Electricity Production" project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD version dated 4th December 2006, which was registered. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the project.

The verifier confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project generates GHG emission reductions.

The verifier can confirm that the GHG emission reduction for the whole monitoring period is calculated without material misstatements. Additionally the verifier confirms that the monitoring plan is in accordance with the methodology ACM0001 version 4 applied for project. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: from March 11, 2007 to December 31, 2007.

Verified emission in the above reporting period:

Emission Reductions: **21133 t CO_{2eq}**

The verification team also determined some few areas of risks for the project in the context of the management / operation system and of quality assurance. Issues indicated as "Forward Action Request" should be submitted as indispensable information to the verification team of the next periodic verification.

Munich, 2008-08-14

Javier Castro

Certification Body "Climate and Energy"

Munich, 2008-08-14

Martin Schröder

Project Manager

Annex 1 a: Initial Verification Protocol

1 INITIAL VERIFICATION CHECKLIST

Objective	Ref.	Comments	Conclusion (FAR / CAR)
1. Opening Session			
1.1. Introduction to audits	1,2,3	Validation carried out by the end of 2006. Plant operational since 1. Jan 2007. UNFCCC registration on 11 of March 2007. See http://cdm.unfccc.int/Projects/DB/SGS-UKL1167844024.69/view.html Compare Information Reference List for Participants and details on documents.	☑
1.2. Clarification of access to data archives, records, plans, drawings etc.	2,3,4	Free access to relevant data sources has been granted. Relevant data sources were accessed onsite in the landfill of Talia and in the office of Madei Taas Ltd. The project has been visited onsite the 26 / 27th of March 2007.	☑
1.3. Contractors for equipment and installation works	1,2	As the project is already fully operational, it is not focused with further detail on the contractors involved in installation of main equipment. The installation of the equipment has been supervised by: Mr. David Alter Site Manager	☑

Objective	Ref.	Comments	Conclusion (FAR / CAR)
		Hagal Talia Energy (at landfill site, see position in PDD) Key monitoring equipment has been installed by: Madei Taas Ltd 21 Hamelacha St.Park Afek 48091 Rosh Ha'ain ISRAEL Madei Taas is also in charge of the maintenance of the equipment.	
1.4. Actual status of installation works	1	The installation of the equipment was completed and the plant was in full operation. The monitoring system was working. The auditors have been informed that the Talia site is currently providing about 750 m3 of LFG / hour (estimate). The validated amount was about 940 m3 / h for the Talia site. The generator was working (caterpillar gas engine) The flare was also working.	☑
2. Open issues indicated in validation report			
2.1. Missing steps to final approval	3	The project was validated successfully and registered by UNFCCC on 11 March 2007. No missing steps.	☑

Objective	Ref.	Comments	Conclu-sion (FAR / CAR)
3. Implementation of the project			
3.1. Physical components	1,2,3, 4	The following components have been visited: - 37 wells on the Talia site - Pipeline to generator, aprox. 400 m - Cooler - Caterpillar motor and generator (also used for Hagal site) - Enclosed flare (also for Hagal site) - Monitoring equipment have been found in line with the corresponding flowchart. Consistency with the PDD and the Monitoring Plan is considered to exist (compare Monitoring plan and plant overview)	☑
3.2. Project boundaries	2,3	Hagal site is neighboring directly to installations. Gas pipelines and metering divided according the 2 different sites. The LFG streams are unified before going to flare and generator, which is inline with the flowchart of the monitoring system and the PDD indications. It is highlighted that the gas of the Hagal site is used for electricity production according to the project design (I.D). In the sketch of the project boundary the site of Hagal is not included. This aspect was dealt with by a Information Request (NIR) issued by the validator SGS.	☑

Objective	Ref.	Comments	Conclusion (FAR / CAR)
3.3. Monitoring and metering systems	1,4,5,6,7,8,9,10,11 12	Metering: During the onsite visit, the installed metering system has been reviewed and found operational. **Corrective Action Request No 1** The flow chart of the metering system should be brought to consistency in its labeling of the individual meters (3 letter code) with the Plant Operations Journal / Data Sheets generated by the PLC. Consider also to include the serial numbers of the meters to the flowchart. **Corrective Action Request No 2** For the methane analyzer, background documentation and calibration has been provided for one device. In the flowchart two devices are indicated (Hagal-BOH/ Talia-BOT). Complete calculations on CH_4 mass are necessary for Hagal also in order to calculate the Emission Reductions for Talia. Thus, further clarification on CH_4 metering is requested. Furthermore, the CH_4 analyzer is positioned after LFG capture on site and ahead of the blower. The blower is considered to potentially cause additional air input (if not a closed system). Further clarification is requested. *As a result of resolution of CAR2 issued at 27.7.2007* **Forward Action Request No.4** The consistency of data series for emission reduction calculation be-	All CAR resolved, FARs on analyzing device on exhaust gas and recording by PLC to be reviewed at first periodic verification. FAR 4 newly incorporated.

Objective	Ref.	Comments	Conclu-sion (FAR / CAR)
		fore and after the modifications on metering (methane analyzer / blower) need to assured at first periodic verification.. **Corrective Action Request No 3** In regard to the flow meters of the landfill sites, the secondary documents provided indicate that they are to be used for atmospheric pressure. The blower installed ahead of the flow meters (F2H, F2T) nonetheless increases pressure above these levels. Further clarification on this aspect of consistency is requested. **Corrective Action Request No 4** Regarding the flare system, a secondary gas pipeline (EV01) is installed that leads to the exhaust of the flare (without burning). As the flow meter is installed ahead of the separation of the gas pipes, it needs to be clarified how it is assured that it is not accounted for Emission Reductions via flaring that are actually not burned. **Forward Action Request No.1** For the periodic measurements of the methane in the exhaust gas a portable device is used. The maximum accuracy of +/- 0,5 % of the device needs to be considered. The device should also be considered for (field) calibration. Consider to use a measurement system that indicates ppm of methane in exhaust gas (e.g available in disposable form).	

Objective	Ref.	Comments	Conclu-sion (FAR / CAR)
		Monitoring: In regard to the automatic data reading, the system was operational. Daily data reading on a manual basis was carried out, but found partially inconsistent with overall data requirements as defined by the Monitoring Plan. A draft template for manual readouts was submitted (as part of Plant Operations Journal) and considered structured adequately. However, the project host indicated that the format to be used is under revision. **Forward Action Request No.2** The structure / format / final layout of the main daily monitoring sheets and the monthly aggregation remains to be defined and submitted in its final version (in line with scheduled reading procedures) The template to be used needs to be in full consistence with requirements of the Monitoring Plan for each parameter (e.g. continuous reading, electronic and paper): 1-3 (LFG), 5 (flame temp.), 6 (W_{CH4}), 7 (T), 8 (P), 9 (El_{ex}),10 (El_{imp}) (and for Hagal:) 16 (LFG), 17 (Pres), 18 (Temp), 19 (CH4 in LFG). Note that for 9 (El_{ex}),10 (El_{imp}) metering / reading is considered necessary for crosschecking the data as provided by the utility. Furthermore the template and reporting needs to consider: i) operating hours of the flare and ii) operating hours of the engine. The final layout that will be used (and that is in line with data provided by the PLC) shall be submitted to the auditor.	

Objective	Ref.	Comments	Conclusion (FAR / CAR)
		If the draft version of the template for manual readings (Plant Operations Journal) is used in any form (e.g. for crosschecks / as part of a procedure if the PLC fails / to complement data that is not available via PLC) include clear labeling of the meters. An updated version of the template shall be made available.	
3.4. Data uncertainty	4,5,6,7,8, 9,10,11,	Data uncertainty is considered to be defined by the technical specifications provided by the producers of the meters. Accuracy is considered to be in acceptable ranges if calibration requirements are complied with as scheduled (see 3.5).	☑
3.5. Calibration and quality assurance	4,5,6,7,8, 9,10,11,	In regard to quality assurance, it has been noted that state of the art technology has been applied. The involved specialists in the field of monitoring have the necessary expertise and qualification. Calibration documents have been provided for the flow meters and one methane analyzer. **Corrective Action Request No 5** Calibration: A concrete maintenance plan needs to be developed that includes i) initial calibration status and ii) the upcoming calibration necessities of each meter and corresponding responsibilities over time (as an applicable procedure for onsite use). **Corrective Action Request No 6** The calibration for temperature and pressure transmitters remain to be made available.	☑

Objective	Ref.	Comments	Conclusion (FAR / CAR)
		For the methane analyzer see also section 3.3.	
3.6. Data acquisition and data processing systems	1,4	The PLC provides key data on metering. However, some parameters (e.g. operating hours, El_{ex}, El_{imp}) currently rely exclusively on manual readings. Compare corresponding requests that have been made in the context of 3.3 of this table. The details of the backup system are included in the PDD and have been revised onsite.	☑
3.7. Reporting procedures	1,2,3,12	Daily, monthly and yearly monitoring requirements are indicated in the PDD and the Monitoring Plan. **Corrective Action Request No 7** In addition and as update to the draft Plant Operation Journal (see also 3.3.) a concrete procedure / Monitoring Manual with a schedule (daily / monthly / yearly) on monitoring and reporting requirements for each parameter remains to be elaborated. Clear responsibilities for the data to be monitored need to be included for each parameter. (Daily and monthly monitoring in line with draft operations journal and under consideration of 3.3; for yearly data consider external data (see 5.1) and also CH_4 measurements in waste gas). Concrete procedures for internal revision of monitoring data and corresponding responsibilities remain to be incorporated (to such a doc-	☑

Objective	Ref.	Comments	Conclu-sion (FAR / CAR)
		ument to be used onsite). Procedures need to be documented in the case of non-availability of current staff. The correspondingly compiled and documentation and a statement that the local team has been instructed correspondingly shall be submitted (compare 3.8).	
3.8. Documented instructions	1,2,3,12	The PDD and the Monitoring Plan include instructions. The reporting procedures (See 3.7.) shall be used as instruction.	☑
3.9. Qualification and training	1,2,3,12	The involved and interviewed staff was encountered to dispose of the necessary expertise. See 3.7 for responsibilities and personnel in charge.	☑
3.10. Responsibilities	1,2,3,12	See 3.7.	☑
3.11. Troubleshooting procedures	1,2,3,12	As indicated in Annex 4 / Monitoring Plan of the PDD. **Corrective Action Request No 8** It shall be considered to include the indications in regard to failure of monitoring devices as described in the PDD to a separate procedure / Monitoring Manual for onsite use.	☑
4. Internal Data			

Objective	Ref.	Comments	Conclusion (FAR / CAR)
4.1. Type and sources of internal data	4,5,6,7,8, 9,10,11	The metering system was encountered to be in line with validation specifications. Technical descriptions have been obtained for: - flow meter, - pressure transmitter, - temperature transmitter, including calibration reports, - methane analyzer - Technical description for monitoring of methane in waste stream (already on CD) **Corrective Action Request No 9** The following data needs to be provided: - Technical specifications of electricity meter for Import / export. Currently the project monitors the amount of LFG from the two sites. Then the streams are unified. Beyond that the gas inserted to flare and the engine / generator is monitored. Thus, the specific source of the gas used in electricity production and flare is undefined. For electricity production the source is not relevant as the second site of Hagal is accounted for via the SSC methodology I.D.	CAR resolved, FAR on ER calculation will be further analyzed at first periodic verification.

Objective	Ref.	Comments	Conclu-sion (FAR / CAR)
		Forward Action Request No.3 It remains unclear how the amount methane from Talia destroyed via flaring is calculated exactly. (compare statement included in D.2.4 and NIR 4 of validation report). An example on the concrete calculations of the project's Emission Reductions shall be submitted to the auditor (e.g. for the first month based on an Excel Spreadsheet).	
4.2. Data collection	1,2,3,12	Key data will be gathered via the PLC. Storage procedures are indicated in the PDD. An update of internal procedures on data collection has been requested under 3.7.	☑
4.3. Quality assurance	1,2,3	Monthly revision is of daily reposting is scheduled. Compare 3.7	☑
4.4. Significance and reporting risks	1,2,3	Due to automated gathering of monitoring data and the integrated alarm system, reporting risks are considered to be low. Measures of quality assurance, such as e.g. the manual reading of meters in addition to data logging, are estimated to reduce risks further.	☑
5. External Data			
5.1. Type and sources of external data	1,2,3	**Corrective Action Request No 10** In order to sustain (in addition to meter readings) the monthly export	☑

Objective	Ref.	Comments	Conclu-sion (FAR / CAR)
		and import of electricity to the grid, the monthly electricity invoices need to be available for verifications: i) for bought energy. ii) for sold energy. In line with requests on the update of the Operations Journal (3.7.), it shall be confirmed / clarified who has the responsibilities to gather corresponding documents and where they are stored (compare also p.45 of PDD). Furthermore, the invoices for February or March 2007 shall be made available. Comment: Revisions of the emission factor for the grid need to be carried out on a yearly basis. In line with requests indicated under 3.7. responsibilities shall be indicated also for the parameters to be monitored on a yearly basis.	
5.2. Access to external data	1,2,3	See 5.1	☑
5.3. Quality assurance	2	The indications on internal revisions are also applicable to external data sources.	☑
5.4. Data uncertainty	2	Considered low, as recognized and approved sources are used: The invoices on the electric meters and the input data for national emission factors.	☑

Objective	Ref.	Comments	Conclusion (FAR / CAR)
5.5. Emergency procedures	2	N/A	☑
6. Environmental and Social Indicators			
6.1. Implementation of measures	1,2	In line with the indications of the PDD, the project is considered to produce environmental benefits. No negative impacts caused specifically by the CDM project have been witnessed onsite. There are no indications that the flaring has negative impacts on birds. Payment procedures for local employees are installed. t	☑
6.2. Monitoring equipment	-	N/a	☑
6.3. Quality assurance procedures	-	N/a	☑
6.4. External data	-	N/a	☑
7. Management and Operational System			
7.1. Documentation	1,2,3	The Monitoring Plan (e.g. pp 44-45 of the PDD) includes indications on the documentation and storage of monitoring data.	☑

Objective	Ref.	Comments	Conclu-sion (FAR / CAR)
		The Request as included in 3.3. and 3.7 of this table update complement the documentation requirements.	
7.2. Qualification and training	1,2,3	Project management and the onsite team was encountered well prepared and of high level technical expertise.	☑
7.3. Allocation of responsibilities	1,2,3	Madei Taas holds overall responsibilities for the monitoring. The further documentation as requested for section 3.7 will provide further information of responsibilities per each parameter.	☑
7.4. Emergency procedures	1,2,3	The PDD indicates the scenarios to be adapted in regard to failure of different monitoring elements of the project scheme. Compare section 3.7 / 3.11. It remains to be confirmed that the onsite team has been informed / trained in regard to the measures (as indicated in the PDD, p. 45) to be taken if defined monitoring equipment is not operational.	☑
7.5. Data archiving	1,2,3	PDD / Monitoring Plan include indications on data storage. A back up system for the automatic PLC has been revised onsite.	☑
7.6. Monitoring report	1,2,3	At current state of initial verification no Monitoring Report has been available. Besides the monitoring of all relevant basic data, it is considered important that the structure and content of the monitoring report to be delivered is prepared in advance to regular verification (upcoming e.g. in one year).	☑

Objective	Ref.	Comments	Conclusion (FAR / CAR)
7.7. Internal audits and management review	1,2,3	The PDD includes the scheduled activities for internal revision of monitoring data. Compare also requests on section 3.3 in this context.	☑

Annex 1 b: Periodic Verification Protocol

Table 1: Data Management System/Controls

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. A score is assigned as follows:

- Full - all best-practice expectations are implemented.
- Partial - a proportion of the best practice expectations is implemented
- Limited - this should be given if little or none of the system component is in place.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
1. Defined organisational structure, responsibilities and competencies		
1.1.Position and roles *Position and role of each person in the GHG data management process is clearly defined and implemented, from raw data generation to submission of the final data. Accountability of senior management must also be demonstrated.*	Full	On site level the data the responsibilities for monitoring and supervision of project related activities rest with: Mr. David Alter, Hagal Talia Energy Roi Federman, Hagal plant supervisor Supervision and processing of data rests with Alex Voskoboinik, Projects Manager; Madei Taas Ltd Madei Taas is specialised in monitoring and metering. This structure is in line with the monitoring tasks defined (i.e. in PDD; annex 4). The internal document "Monitoring Plan" (Rev. 3) indicates internal responsibilities for concrete meter reading. A quality control document further details responsabilities (Plant maintenance Journal – Quality control manual).

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
1.2.Responsibilities *Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees.*	Full	See above. It was witnessed that the initially agreed formats for record keeping have been followed.
1.3.*Competencies needed* *Competencies needed for each aspect of the GHG determination process are analysed. Personnel competencies are assessed and training programme implemented as required.*	Full	The competencies for each aspect of the GHG determination process have been thoroughly checked and are consistent with the indications in the Monitoring Report. Experience and training level employees guarantee a high level of competence.
2. Conformance with monitoring plan		
2.1.Reporting procedures *Reporting procedures should reflect the monitoring plan content. Where deviations from the monitoring plan occur, the impact of this on the data is estimated and the reasons justified.*	Partial	The monitoring plan presented in the PDD is followed in the practice. The data has been gathered in the requested hardcopy forms as well as in digital by a PLC unit for all (four) flow meters (incl temp and pressure), the methane analyzer as well as the flare temperature. The monitoring frequencies as required in the registered Monitoring Plan are complied with. **Corrective Action Request No.1** The monitoring Results for FE, AF (due to regulations) and EFgrid remain to be incorporated to the Monitoring Report in section B.2.2 (instead of B.2.1 /defaults)
2.2.Necessary Changes *Necessary changes to the monitoring plan are identified and changes are integrated in local procedures as necessary.*	Partial	Monitoring Plan is correctly applied. Nonetheless the above mentioned information should be included on the monitoring report, to confirm the emission reductions.
3. Application of GHG determination methods		

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
3.1.Methods used *There are documented description of the methods used to determine GHG emissions and justification for the chosen methods. If applicable, procedures for capturing emissions from non-routine or exceptional events are in place and implemented.*	Partial	The method to determine GHG emissions is fully documented. The methodologies are followed as defined in the PDD. The formula introduced in the PDD are followed. The special event log was followed and corresponding events have been listed in the Monitoring Report. **Corrective Action Request No 2** Please indicate in the MR for the baseline as well monitoring methodology the correct version number applied (both, for ACM 0001 and I.D; section A.5 of MR)
3.2.Information/process flow *An information/process flow diagram, describing the entire process from raw data to reported totals is developed.*	Full	The processes and information flows and corresponding responsibilities are followed as defined in relevant secondary documentation and the registered PDD. As stated above, the hardcopy / manual data gathered onsite is sustained with PLC information so that a robust backing of data is available.
3.3.Data transfer *Where data is transferred between or within systems/spreadsheets, the method of transfer (automatic/manual) is highlighted - automatic links/updates are implemented where possible. All assumptions and the references to original data sources are documented.*	Full	The manually gathered data from readings is stored in hardcopy files (in situ and in office). The PLC data, which is also covered by a back up system, is extracted on a monthly basis in a .csv file, form where it is then converted to Excel files and aggregated. Other data, on electricity (imp, exp) is gathered in hardcopy form as provided by the different utilities, and then manually converted to an excel file for processing.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
3.4.Data trails *Requirements for documented data trails are defined and implemented and all documentation are physically available.*	Partial	All main documents with the raw data are available and all primary data which were retrieved on a random basis could be confirmed. In essence, the amount of methane destroyed by the generator as well as the amount of electricity produced is consistent in the data trail and the estimates are considered conservative. In regard to the data on electricity imports and exports it was noted that electricity is sold not only to the Isreal Power Company (IEC) but also to two Kibutz (Dagania B. and Ashdot Yaakov). The aggregated numbers for total exports are indicated below. Import only occurs from IEC. The documentation on export and import of electricity and corresponding evidence (invoices) was reviewed. The net electricity export documented in this manner is 5.822.117 kWh. For actual calculations as per MR the lower value (net) of the two values a) electricity exported and sustained with invoices and b) the amount actually metered onsite (net / generator) by the project participant shall be used. The actual value of the net electricity produced is 5.381.181 kWh, which is lower and with that conservative in comparison to the invoiced value. This value has been compiled by a) 4.896.490 kWh (net generator, metered) plus b) calculated amount of 489.691 kWh. Hence, the total invoiced is lower than the amounted metered at generator. It was estimated that also on the monthly level the values invoiced are lower than the metered data. However, review was only partly possible due to the fact that monthly sales data to different clients did not always cover full months.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
		In regard to calculated amount / special event no. 9: A total of 21 days of interrupted metering between central data unit and meter at generator occurred. The produced electricity was calculated based on average electricity export per ton CH4. The latter is estimated to be conservative also in comparison with reviewed manual data recording (daily paper records) and it was documented that also the buying company paid for electricity production. In light of the latter, and the fact that overall invoiced production is lower that the metered amount, the auditing teams accepted the approach. The amount of methane destroyed via flare is backed by the corresponding metering data. Data logging was used. The project developer has calculated errors of metering devices and reduced the claimed emission reductions correspondingly, which underlines an overall conservative approach. **Corrective Action Request No. 3** Flare efficiency remains to be calculated considering the relation between the average methane content of the LFG to be destroyed and the remaining methane content in the exhaust gas. Update also formula in Section D.1 of MR.
4. Identification and maintenance of key process parameters		
4.1.Identification of key parameters *The key physical process parameters that are critical for the determination of GHG emissions (e.g. meters, sampling methods) are identified.*	Full	Yes, all key parameters are identified. The list of meters is included to section B.1 of the Monitoring Report. For methane content in exhaust gas a meter was used with an accuracy of 0,5%.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
4.2.Calibration/maintenance *Appropriate calibration/maintenance requirements are determined.*	Partial	Calibration documents were submitted for flow meters (27.1.08) and methane content. In section B.1. the calibration intervals are indicated. Flow meters have yearly calibration intervals. Methane analyzer every 3 months. The calibration is partially done by Madei Taas, which holds corresponding accreditations. **Corrective Action Request No. 4** Assure consistency and clear indication of last calibration event in the included table (B.1), respectively submit remaining calibration documents. Clarify the calibration requirements for electricity meters. **Forward Action Request No. 1** It is considered relevant, that calibrations are outsourced to a third party from time to time. At least each third calibration for the relevant meters where Madei Taas is calibrating (while complying with relevant requirements) should be done by another company.
5. GHG Calculations		

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
5.1.Use of estimates and default data *Where estimates or default data are used, these are validated and periodically evaluated to ensure their ongoing appropriateness and accuracy, particularly following changes to circumstances, equipment etc. The validation and periodic evaluation of this is documented.*	Partial	Following default are used correctly: GWP for methane; Specific gravity of methane The calculations included to the PDD follow the formulae as defined. The Emssion Reductions from MD proj (Talia) are calculated based on MD flare and MD gen minus the CH4 from the Hagal site (non-CDM). Further calculations are: MD gen: The mass of the entire LFG from both landfill sites is weight statistically with the volume of LFG going to the generator. MD flare: The mass of the MD for both sites is reduced by the MD in the generator. Compare formula 9+11 in Annex 4 of MR. The calculations and the corresponding data is considered consistent and has been checked. **Corrective Action Request No. 5** The EF of the Isreal grid should be updated in line with the annual monitoring requirement. **Corrective Action Request No. 6** In section B.3.2, the emission reduction are considered baseline emissions (to be erased at this position). Section D.3.4 should include a clear overview of the claimed Emission reductions from Methane destruction and net electricity exported. **Corrective Action Request No. 7** Include in the Monitoring Report a table (or adapt existing ones) that clearly indicates the result / number (if applicable average) for each parameter as defined by the registered monitoring plan (in PDD / D.2.21). Note requirement as of EB 28: “All of the monitoring parameters required by the registered monitoring plan are reported by the project participants at the intervals required by the registered monitoring plan, all data is contained in the monitoring report, and the report has been supplied in an assessable format.”

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
5.2.Guidance on checks and reviews *Guidance is provided on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented. This includes spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.*	Full	To a better performance of data collection, the project team has performed Internal reviews, to reduce any kind of error in the manual data transferring to excel sheets, calculations, all aiming to reduce data management risk. Large part of the documentation is gathered twice and stored twice (hardcopy and digital with back up)
5.3.Internal verification *Internal verifications include the GHG data management systems, to ensure consistent application of calculation methods.*	Full	A periodic review of the calculations were performed every time when data is transferred to an excel sheet. Equations are defined as stated on the methodology, and the PDD. As indicated above internal reviews are performed to assure data quality.
5.4.Internal validation *Data reported from internal departments should be validated visibly (by signature or electronically) by an employee who is able to assess the accuracy and completeness of the data. Supporting information on the data limitations, problems should also be included in the data trail.*	Full	Data reported is validated internally by the manager in charge / Mr. Alex Voskoboinik. A special event log has been installed in order to document any irregularities.
5.5.Data protection measures *Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).*	Full	The project counts with manual hardcopy and the electronic PLC system with a complete back up system. Data is extracted and stored in a further computer (office Tel Aviv) on a regular / monthly basis.
5.6.IT systems *IT systems used for GHG monitoring and reporting should be tested and documented.*	Full	All the Information is reported by the site managers and consolidated directly in the Headquarters. The PLC system for data tracking is operational and corresponds to sate of the art technology. Back up system is installed.

Table 2: GHG calculation procedures and management control testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
Based on an assessment of the emission calculation procedures potential reporting risks are • technical failures in metering devices not being realized by the operation team • human failures in reporting exceptional events • human errors in reporting data • IT risk by copying data into the calculation sheets	• Technical failures due to malfunctioning and not changed devices. Calibration certificates were provided. • Human errors regarding to reporting procedures which are double checked internally. • Human errors by manipulation of data obtained. Internal supervision processes are in place. • A wrong procedure in operating the gas capture, generator and flare would have a direct impact on the emission reduction. • Raw data copied or processed from PLC (csv to an excel sheet could generate some errors of transcription.	• Record of manually data collection appears. This is however backed by PLC data. Consistency of data sources is to be assured. • Change of key personnel in the monitoring responsibilities. • Wrong data for emissions reductions calculations.

Table 3: Detailed audit testing of residual risk areas and random testing

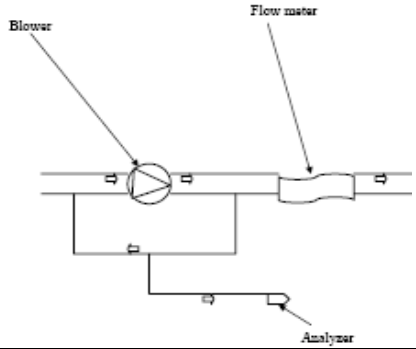
Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Record of manually data collection appears. This is however backed by PLC data. Consistency of data sources is to be assured.	The manually gathered data is used to countercheck the results of the PLC unit. E.g in regard to net electricity, two values were available (with corresponding data backing) and only the lower was used for Emission reductions.	The counterchecking of PLC and manually gathered data could be extended. Errors are being controlled, due to a direct and controlled transferring of data. Risk is reduced, but not impossible.
Change of key personnel in the monitoring responsibilities.	The local plant staff is well trained on the corresponding technical elements. Madei Taas disposes wide technical experience in metering and monitoring.	It should be considered that the expertise on the processing of monitoring data / reporting is shared by several individuals.
Wrong data for emissions reductions calculations.	The data is being checked with the manual information also available. Besides the reporting, data transferred and processed should be reviewed, e.g. in order to consider alarms or other extraordinary events.	Data should be confirmed twice every time when transferred to an excel sheet. See above for FAR on calibrations.

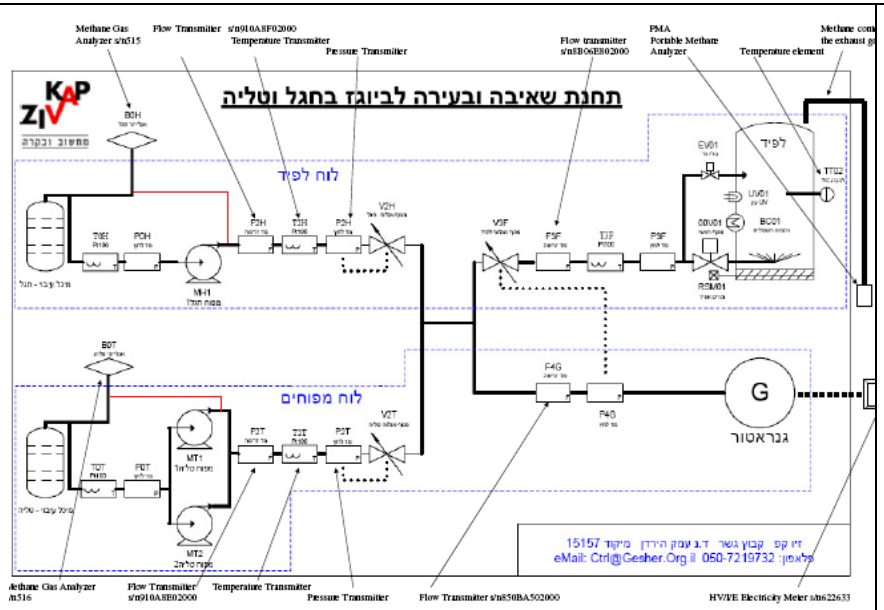
Table 4a: Compilation of (open) issues from Initial verification

Clarifications and corrective action re-quests by validation team	Summary of project owner response	Validation team conclusion
Forward Action Request No.1 For the periodic measurements of the methane in the exhaust gas a portable device is used. The maximum accuracy of +/- 0,5 % of the device needs to be considered (in Emission Reduction Calculations). The device should also be considered for (field) calibration. Consider to use a measurement system that indicates ppm of methane in exhaust gas (e.g available in disposable form).	18.4.2007 Clear and accepted, see Yearly journal and Maintenance template, to be filled Auditor: Consistency of accuracy of methane analyzer with values to be measured in exhaust gas needs to be made sure. See initial comment. Current device is considered inappropriate for PPM indications. Potentially check, e.g. the firm Bacharach as provider for disposal measurement devices with ppm precision. 20.5.2007 Under processing in cooperation with Mr. Koch	At first periodic verification: ☑ Methane analysis in exhaust gas was carried out with a device of +/- 0,5 accuracy. For monitoring periods a different approach at ppm level is chosen. First measurements already carried out, but not considered because they were done after monitoring period end. Complementary comment 25 June 2008: Default of 90% flare efficiency is applied.
Forward Action Request No.2 The structure / format / final layout of the main daily monitoring sheets and the monthly aggregation remains to be defined and submitted in its final version (in line with scheduled	18.4.2007 The project documents and templates, updated according to your request and attached.	At first periodic verification:

reading procedures) The template to be used needs to be in full consistence with requirements of the Monitoring Plan for each parameter (e.g. continuous reading, electronic and paper): 1-3 (LFG), 5 (flame temp.), 6 (W_{CH4}), 7 (T), 8 (P), 9 (El_{ex}),10 (El_{imp}) (and for Hagal:) 16 (LFG), 17 (Pres), 18 (Temp), 19 (CH4 in LFG). Note that for 9 (El_{ex}),10 (El_{imp}) metering / reading is considered necessary for crosschecking the data as provided by the utility. Furthermore the template and reporting needs to consider: i) operating hours of the flare and ii) operating hours of the engine. The final layout that will be used (and that is in line with data provided by the PLC) shall be submitted to the auditor. If the draft version of the template for manual readings (Plant Operations Journal) is used in any form (e.g. for crosschecks / as part of a procedure if the PLC fails / to complement data that is not available via PLC) include clear labeling of the meters. An updated version of the template shall be made available.	Explain, if you insisting on including of the i) operating hours of the flare and ii) operating hours of the engine, in line with data provided by the PLC? Auditor: Daily Journal (hardcopy) considered consistent with Monitoring requirements. As analyzed onsite it is scheduled to streamline the PLC data with the monitoring plan / format presented. Operating hours of flare and engine should be recorded (possibly also calculated) 20.5.2007 The technical solution of directly streamline data or calculation, according to Flare gas temperature and Export electricity totalising still under investigation of Mr. Koch. Until fixing of the issue by electronically recorded data, the above data recorded manually from electronic counters of the flare and engine.	☑ Hardcopy record keeping is considered adequate. The registered monitoring plan requires data records on paper.
Forward Action Request No.3 The consistency of data series for emission reduction calculation before and after the modifications on metering (methane analyzer / blower) need to assured at first periodic verification. (FAR4).	25.7.2007 Consistency of calculations on emission reductions will be analyzed at first periodic verification. Compare CAR 2 for background information.	At first periodic verification: ☑ Metering design is considered consistent.
Forward Action Request No.4 It remains unclear how the amount methane from Talia destroyed via flaring is calculated exactly. (compare statement included in D.2.4 and NIR 4 of validation report). An example on the concrete calculations of the project's Emission Reductions shall be submitted to the auditor (e.g. for the first month based on an Excel Spreadsheet).	18.4.2007 To be advised ASAP. Auditor: The exercise to actually calculate the emission reductions (apply PDD formulae) should be done as early as possible. Item was discussed with Mr. Koch in Cologne.	At first periodic verification: ☑ Calculations have been reviewed and confirmed.

	20.5.2007 Carried by Mr. Koch Auditor: The special design of the project with two related landfill sites, the actual calculation of Emission reduction is considered to be of special relevance and will be further analyzed at regular periodic verification.	
Corrective Action Request 1: The flow chart of the metering system should be brought to consistency in its labeling of the individual meters (3 letter code) with the Plant Operations Journal / Data Sheets generated by the PLC. Consider also to include the serial numbers of the meters to the flowchart	18.4.2007 The flowchart under development according to your request , and will be advised ASAP Auditor: Overview flow chart remains. Please correct serial number on F2H and F2T in Plant Maintenance Plan. 20.5.2007 Attached flow chart. Auditor: Flow chart in English received. Serial numbers in Maintenance Plan have also been corrected.	☑
Corrective Action Request 2: For the methane analyzer, background documentation and calibration has been provided for one device. In the flowchart two devices are indicated (Hagal-BOH/ Talia-BOT). Complete calculations on CH_4 mass are necessary for Hagal also in order to calculate the Emission Reductions for Talia. Thus, further clarification on CH_4 metering is requested. Furthermore, the CH_4 analyzer is positioned after LFG capture on site and ahead of the blower. The blower is considered to potentially cause additional air input (if not a closed	18.4.2007 Recheck, provided for you on CD certificates for two devices : s/n 0515 and 0516, in fact two devices installed, and photographed by you. The gas analyzers installed after blowers, so additional air input from blower controlled by CH4 and O2 monitoring, and if O2 above 10%, the blower trip. Auditor: Calibration certificate of device 516 was not included, only testing	☑ Complementary comment 25 June 2008: The differences (in mean) of CH4 content before and after the installation change of the gas analyzer have been demonstrated

system). Further clarification is requested.	sheets. Please complement. 20.5.2007 Calibration Certificate attached. The primary analyzers were installed after blowers, but on later stage, according to requirement of EHEIM, location of analyzers was changed, ahead of the blowers. For clarification of prevention of potentially cause additional air input, we can to provide report of pressure test of piping . Is it OK for you? Auditor – 15.7.2007 The confirmation of changes in the monitoring architecture (to the order of devices: blower, methane analysis at both sites, flow meters) was submitted. Based on the latter the avoidance of measuring increased volumes (due to air input from blowers) is considered not to be possible.  	to be very small (less than 1%, not systematic between landfill sites). However, in order to demonstrate conservativeness, the CH4 content measured previously to installation change were capped at 95% of the mean. The latter is considered conservative by the audit team.

		
Corrective Action Request 3: In regard to the flow meters of the landfill sites, the secondary documents provided indicate that they are to be used for atmospheric pressure. The blower installed ahead of the flow meters (F2H, F2T) nonetheless increases pressure above these levels. Further clarification on this aspect of consistency is requested.	18.4.2007 In regard to the flow meters of the landfill sites, the secondary documents (what is secondary document?) provided indicate that they are to be used for atmospheric pressure (what you mean?). The blower installed ahead of the flow meters (F2H, F2T) nonetheless increases pressure above these levels (which levels?). Further clarification on this aspect of consistency is requested Auditor: Item was related to pressure pot. generated by blower. It is highlighted that we refer to consistency between blower (that might produce increased pressure) and subsequent flow meter (operation pa-	☑

	rameters indicate pressure from 70-100 mbar). Here it needs to be clarified if the blower does produce values beyond that range indicated for the flowmeter. Thus please indicate the details of the blower in regard to pressure and potential additional air input that could inflate the metered amount of gas. 20.5.2007 The sum of gauge gas pressure, measured by pressure transmitters, and barometric absolute pressure, measured by gas analyzers, give possibility to calculate pressure correction factor in formula of CH4 actual density. D ch4=0.0007168*(Pabs barometric + Pgas)/Pabs barometric std)*(273.15 [K]/ T gas [K]), where P abs barometric std=101.3 kPa (or 1013 hPa, as measured and calculated in our system.)	
Corrective Action Request 4: Regarding the flare system, a secondary gas pipeline (EV01) is installed that leads to the exhaust of the flare (without burning). As the flow meter is installed ahead of the separation of the gas pipes, it needs to be clarified how it is assured that it is not accounted for Emission Reductions via flaring that are actually not burned.	18.4.2007 The EV01 is solenoid for ignition of flare on start only, controlled by PLC. The EV01 (line) is normally closed, and when the solenoid opened for short time, gas, passed via the line ignited by spark plug, and after start of operation of flare, the EV01 immediately closed, or after proving of flame, or by timer. So, situation, when LFG coming via EV01 and not burned is not possible (except of summery of number of failures, but this failure situation will be noted in report)	☑
Corrective Action Request 5: Calibration: A concrete maintenance plan needs to be developed that includes i) initial calibration status and ii) the upcoming calibration necessities of each meter and corresponding responsibilities over time (as an applicable proce-	18.4.2007 See attached maintenance templates and documents. If something missed, inform us. Auditor:	☑ The calibration requirements as per methodology and monitoring plan are

dure for onsite use).	Consider to include concrete dates for upcoming calibrations, especially methane analyzer (each 3 months) in order to avoid troubles with out-dating, 20.5.2007 The revised maintenance plane attached Auditor: Document reviewed and considered satisfactory.	complied with.
Corrective Action Request 6: The calibration for temperature and pressure transmitters remain to be made available.	18.4.2007 Clear and accepted, see template of Maintenance journal Auditor: Document reviewed and considered satisfactory.	☑
Corrective Action Request 7: In addition and as update to the draft Plant Operation Journal (see also 3.3.) a concrete procedure / Monitoring Manual with a schedule (daily / monthly / yearly) on monitoring and reporting requirements for each parameter remains to be elaborated (for onsite use).	18.4.2007 See attached monitoring journals and manual Auditor: Document reviewed and considered satisfactory.	☑
Corrective Action Request 8: It shall be considered to include the indications in regard to failure of monitoring devices as described in the PDD to a separate procedure / Monitoring Manual for onsite use.	18.4.2007 See attached monitoring journals and manual and maintenance journal. Auditor: Document reviewed and considered satisfactory.	☑
Corrective Action Request 9: The following data needs to be provided: - Technical specifications of electricity meter for Import / export.	18.4.2007 Technical specification of the electrical meters PM172EH available on the link http://www.mbcontrol.com/satec_prod.html The operational manual copied to CD have been sent to you. Auditor: Material was printed, checked and taken to files.	☑

Corrective Action Request 10: In order to sustain (in addition to meter readings) the monthly export and import of electricity to the grid, the monthly electricity invoices need to be available for verifications: for bought energy. for sold energy. In line with requests on the update of the Operations Journal (3.7.), it shall be confirmed / clarified who has the responsibilities to gather corresponding documents and where they are stored (compare also p.45 of PDD). Furthermore, the invoices for February or March 2007 shall be made available.	18.4.2007 clear and accepted, see also attached documents Auditor: Make sure to hold initial invoices (February or March 2007). 20.5.2007 Attached monthly reports March, April 2007 Auditor: Document reviewed and considered satisfactory.	☑

Table 4b: Compilation of (open) issues from First Periodic Verification

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
Corrective Action Request No.1 The monitoring Results for FE, AF (due to regulations) and EFgrid remain to be incorporated to the Monitoring Report in section B.2.2 (instead of B.2.1 /defaults)	Was adapted in revised version of MR. Auditor: Section B.2.2 in considered to include all parameters and data as requested by the registered Monitoring Plan. FE was calculated and included. EF grid was updated and included. The used value of 0,000785 is sustaiend with datad and considered conservative.AF monitoring was included and is set zero.	☑
Corrective Action Request No 2 Please indicate in the MR for the baseline as well monitoring methodology the correct version number applied	Corrected in the revised MR draft 3. Auditor: Version numbers are included as per registered PDD	☑
Corrective Action Request No. 3 Flare efficiency remains to be calculated considering the rela-	Corrected in the revised MR draft 3, and updated in the Summery excel sheet Auditor:	☑

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
tion between the average methane content of the LFG to be destroyed and the remaining methane content in the exhaust gas (0,5% acc. to meter accuracy). Update also formula in Section D.1 of MR.	The flare efficiency was calculated over the amount of methane (considering metering accuracy of 0,5% of handheld meter used). The latter is underlined by further measurements posterior to the end of monitoring period by an approach with higher accuracy (not considered). However, due to the unavailability of further metering data in order to sustain flare efficiency, it was opted to apply the 90% default for enclosed flares. The latter is considered conservative.	
Corrective Action Request No. 4 Assure consistency and clear indication of last calibration event in the included table (B.1), respectively submit remaining calibration documents (temp, pressure). Clarify the calibration requirements for electricity meters.	Corrected in the revised MR draft 3 Regarding electricity meters, according to recommendations and statement of the manufacturer, Satec, the meters are calibrated for life, and periodically calibration isn't required (attached approving letter) Regarding the thermocouple, used for flare temperature indication, periodically calibration of the TC isn't required. Auditor: Calibration is documented adequately.	☑
Corrective Action Request No. 5 The EF of the Isreal grid should be updated in line with the annual monitoring requirement.	The grid factor was updated from 2005 to 2006, as the most recent data available. Auditor: The data was updated. The applied EF is 0.000785 t CO2/kwh. The calculation based on official sources is included to the annex of the MR. The applied valued is considered conservative, also in reference other projects registered recently.	☑
Corrective Action Request No. 6 In section B.3.2, the emission reduction are considered baseline emissions (to be erased at this position). Section D.3.4 should include a clear overview of the claimed Emission reductions from Methane destruction and net electricity exported.	Corrected in the revised MR draft 3. Auditor: Phrasing was changed and overview on emission reductions included.	☑
Corrective Action Request No. 7 Include in the Monitoring Report a table (or adapt existing ones) that clearly indicates the result / number (if applicable	The collected data attached to the MR. Auditor: The intention of the request was that one single overview table with main metering results in line with the registered monitoring plan (com-	☑

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
average) for each parameter as defined by the registered monitoring plan (in PDD / D.2.21). Note as of EB 28: "All of the monitoring parameters required by the registered monitoring plan are reported by the project participants at the intervals required by the registered monitoring plan, all data is contained in the monitoring report, and the report has been supplied in an assessable format."	plementary to list of variables in B.2.2) is included to the MR. The complete set of actual metering data was included as Annex. Hence, all main results are included to the Monitoring Report, partly in separate sections.	
Corrective Action Request No. 8 (newly added 13 August The PDD (p 15) stated that "The project activity regarding methane emissions reduction is limited to the Talia site." However, in the calculation of the emission reduction, the PP applied the methane destruction of 839.172 tCH4 on the total quantity of methane for flaring and electricity generation and methane destruction in Hagal rather than the application of the measured amount of LFG of 833.158 tCH4 only from Talia landfill. Further clarification is required.	PP Response: The PDD (p15) stated, that "The project activity regarding methane emissions reduction is limited to the Talia site. Landfill gas from Hagal is used only for power generation." After applying of the missed measurements errors correction of mass calculation of MD flared.y and MD electricity.y, the corrected calculation of Methane destroyed per year: MD project,y= MD flared,y+ MD electricity,y - Methane delivered from the Hagal field (MDproject,y= 251.629 + 1217.624 - 664.054=805.199 tCH4) Where MD flared.y is flared quantity of methane, corrected by 90% Flare efficiency DOE Response: In the previous version of the Monitoring Report errors were calculated and considered for the metering of the methane flow of the meters in from the landfill site Hagal and Talia (Mass CH4 Landfill [tonn]), as well as for the electricity metering. Errors for the flow meters installed in front of the generator and the flare were not considered. A mismatch in error consideration emerged. The latter contributed to the fact that calculated values for methane destroyed (MDproject, y) exceeded the actually measured amounts of methane from Talia. The revised version of the Monitoring report considerd the errors for the metering of Mass CH4 Generator [tonn] and Mass CH4 Flare	☑

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
	[tonn]. This leads to a total amount of methane destroyed (MDproject, y) that is lower than the amount of Methane measured from the Talia landfill. Therefore, the audit team considers that the use of the adapted values of MD project, y of 805.199 tCH4 is conservative in comparison to the actually measured amount of LFG of 833.158 tCH4 from Talia landfill.	
Forward Action Request No. 1 It is considered relevant, that calibrations are outsourced to a third party from time to time. At least each third calibration for the relevant meters where Madei Taas is calibrating (while complying with relevant requirements) should be done by another company.	To be done on 2008	FAR 1 To be revisited at next verification.

Annex 2: Information Reference List

Reference No.	Document or Type of Information
1.	On-site interviews at the offices and the project site of the "Talia Landfill Gas Recovery Project and Electricity Production", performed between 26-27 March 2007 for the initial verification. A second onsite visit was carried out the 12 February 2008 for the First Periodic verification. **Verification team on site**: Martin Schröder TÜV SÜD Industrie Service GmbH Dr. Albert Geiger TÜV SÜD Industrie Service GmbH (only first onsite visit) **Interviewed persons:** Eli Matz — General Manager, Madei Taas Alexander Voskoboinik — Projects and Service Manager, Madei Taas Roee Federman — Site Manager, Hagal Waste landfill David Alter — General Manager (Energy), Hagal and Talia landfill
2.	Project Design Document, dated 4 th Dec. 2006
3.	Validation Report by SGS dated 3 Jan. 2007, accessible via http://cdm.unfccc.int/Projects/DB/SGS-UKL1167844024.69/view.html
4.	Flowchart on monitoring system, as submitted onsite the 26th March 2007. Final version of flow chart received 15th July 2007.
5.	Digital files and print out of record keeping of the PLC unit (monthly reports, until end of Feb 2007)
6.	Data sheet on pressure transmitter, as provided onsite 26th March 2007
7.	Data sheet on temperature transmitter, as provided onsite 26th March 2007
8.	Data sheet on portable gas analyzer, as provided onsite 26th March 2007
9.	Data sheets on flow meters, including calibration documents, as provided onsite 26th March 2007
10.	Data sheet on Methane analyzer; including calibration documents, as provided onsite 26th March 2007 and completed 20.May 2007
11.	Technical description of flare as provided onsite 26th March 2007
12.	Updated record keeping formats for manual reading, provided 18 April 2007

Reference No.	Document or Type of Information
13.	Maintenance plan on key metering equipment, including calibration requirements, dated 20. May 2007
14.	Draft document titled “Instructions for filling of Plant Operational Journal”, including template for daily measurements
15.	Drawing and confirmation of changed measurement architecture of methane in LFG, 15. July 2007
	First Periodic verification:
16.	Monitoring Report, draft version as published on UNFCCC webpage. Monitoring Report, final version, dated 25. June 2008
17.	Data set of excel spreadsheets on calculated monthly emission reductions, as imported from PLC unit (including crude data logs). 12.2.2008
18.	Copies of paper data sheets from daily and monthly recording according to Daily and Monthly Journal, 12.2.08
19.	Copies of Electricity bills as reviewed onsite, 12.2.2008.
20.	Results of methane measurements in exhaust gas, dated 25.3.2008, (additional documents were submitted on measurements in Jan 2008 but not considered)
21.	Set of calibration documents of flow meters and methane analyzer, 12.2.2008
22.	Special event log sheets, 12.2.2008