Monitoring report form for CDM project activity
(Version 07.0)

MONITORING REPORT		
Title of the project activity	Salvador da Bahia Landfill Gas Management Project	
UNFCCC reference number of the project activity	0052	
Version number of the PDD applicable to this monitoring report	16.0	
Version number of this monitoring report	1.0	
Completion date of this monitoring report	24/03/2021	
Monitoring period number	#10	
Duration of this monitoring period	27/05/2018 to 31/12/2018	
Monitoring report number for this monitoring period	Not applicable.	
Project participants	Battre – Bahia Transferencia e Tratamento de Residuos Ltda. BELEKTRON d.o.o.	
Host Party	Brazil	
Applied methodologies and standardized baselines	ACM0001 – “Flaring or use of landfill gas” (version 19.0)	
Sectoral scopes	13 – Waste handling and disposal	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	-	320,356 tCO_2e
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	308,174 tCO_2e	

SECTION A. Description of project activity

A.1. General description of project activity

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The registered CDM project activity "Salvador da Bahia Landfill Gas Management Project" promotes methane destruction through collection and combustion of landfill gas (LFG) at the Aterro Metropolitano Centro (AMC) landfill, a well-designed and well-managed landfill site located in the city of Salvador, Brazil.

As per its current project design configuration (as described in the PDD valid for the 3rd and last 7-year crediting period of the project activity, combustion of collected LFG (rich in methane (CH4) has occurred as part of the operation of the project activity in the following methane destruction devices:

- Set of 2 high temperature enclosed flares[1]
- Set of 19 identical internal combustion gas engines (which represents, at the same time, (i) additional/alternative methane destruction devices for the project activity and (ii) the major components for a grid-connected electricity generation infrastructure fuelled by LFG under operation within the geographical limits of the AMC landfill since January/2011 and with combined total installed capacity of 20.1 MW)[2].

LFG has been historically generated at AMC landfill due to anaerobic decomposition of Municipal Solid Waste (MSW) disposed in the site. The project activity has been under regular operation since 12/03/2004

[1] The operation of one of the 3 gradually previously installed high temperature enclosed flares (Flare 1) is temporarily interrupted since March/2012 due to required maintenance and overhauling purposes (heavy required overhauling in Flare 1 and its ancillary components). In order to proceed with required heavy overhauling work in Flare 1, the whole flare (incl. related monitoring instruments and ancillary components) was completely disassembled, removed from the project site and sent to a service workshop. Among required service, complete replacement of the flare's ceramic revetment material (despite of the previously occurred replacement of such revetment material in July/2008), significant welding work and complete painting in the flare external surface was diagnosticated as required. Due to cost and budgeting related issues, the required complete overhauling work in Flare was postponed and it is still not yet performed. Thus, more than 7 years after its occurred temporary disassembly and removal from the project site, Flare 1 remains disassembled and with its overhauling work pendent.

It is however relevant to note that, since in January/2011, the largest share of LFG collected as part of the operation of the project activity has been anyway sent for combustion in the set of 19 identical internal combustion gas engines. Thus, only a small fraction of collected LFG has been sent to the set of installed high temperature enclosed flares for combustion. In this context, by taking into account the nameplate flaring capacity of the previously installed 3 flares (Flare 1, Flare 2 and Flare 3), the typical stream of collected LFG that has been sent to the set of flares since year 2011, it is demonstrable that flow of collected LFG as part of the project activity has not been sufficiently high to require Flare 1 to be again under continuous operation (even during temporary interruptions of operation of the set of 19 internal combustion gas engines).

In March/2021 (more than 9 years after the occurred removal of Flare 1 from the project site), it was still unclear when the above summarized required overhauling work in Flare 1 will be finally concluded. The main reason for such undefinition was the yet sensitive economic/financial situation of the project activity which makes budgeting the required overhauling prohibitive. If applicable, upon future occurrence of a final decision that Flare 1 will not be reinstalled in the project site anymore, such decision (of having the project activity permanently encompassing 2 high temperature enclosed flares (Flare 2 and Flare 3) + the set of 19 internal combustion engines as its methane destruction devices) will be opportunely addressed as per applicable CDM rules for addressing permanent post- registration changes in the project design.

[2] As detailed in the PDD, methane destruction through combustion of LFG (rich in methane) also occurring in a set of 19 identical internal combustion gas engines since January/2011 represents a more recently approved major post-registration permanent change in the design of the project activity. The set of 19 internal combustion gas engines represents the basis of 19 state-of-the-art engine-generators set model/series JMS 320 GS manufactured by GE Jenbacher GmbH & Co OHG (with nameplate power generation capacity of 1.06 MW each) which are the major components of a grid-connected power generation facility located within the limits of the AMC landfill. With destruction of methane also occurring through combustion of collected LFG in such set of 19 internal combustion gas engines (which are regarded as additional/alternative methane destruction devices for the project activity), the project activity remains encompassing methane destruction as its unique GHG abatement/mitigation measure. It is relevant to note that, under conformance with the PDD, no emission reductions associated to generation of electricity by such grid-connected electricity generation infrastructure (entirely fuelled by LFG) is accounted and/or claimed as part of the project activity.

(with set of high temperature enclosed flares representing the unique methane destruction devices). On 01/01/2011 the set of 19 internal combustion gas engines started operating with such engines representing additional methane destruction devices for the project activity.

The project activity has been operated by the host-country project participant and project owner Bahia Transferência e Tratamento de Resíduos S.A. (BATTRE) since its implementation and commissioning. BATTRE is a special purpose waste management company that was established to undertake services of collection, transport and disposal of all MSW generated in the city of Salvador, Bahia in Brazil. All BATTRE's operations related to management of MSW (including the construction and operation of the AMC landfill) have been performed as per the directives/requirements of a previously established public service concession contract for MSW management that was previously established between BATTRE and the Administration of the Municipality of Salvador in year 1999 the context of a public tendering process.

By the end of the considered monitoring period, the implemented project's LFG collection system encompassed about 235 operational vertical LFG collection wells. No horizontal LFG collection trenches have so far been utilized for collecting LFG at the AMC landfill. During the considered monitoring period, LFG was collected at the AMC landfill with the utilization of centrifugal blowers which are connected to the project's LFG collecting pipeline network.

Consumption of electricity by the project activity (electricity regarded as sourced by the grid and electricity sourced by installed backup captive off-grid electricity generator (fueled by diesel)):
During the considered monitoring period, the electricity demand of the project activity has been mostly met by electricity generated by the set of 19 engine-generators (for which the set of 19 internal combustion gas engines represents major components). During limited time periods when set of 19 internal combustion gas engines has not been under operation (temporary interruptions), the electricity demand of the project activity has been mostly met by imports of grid-sourced electricity (through the same dedicated transmission line which is used for exporting electricity generated by the set of 19 engine-generator sets). As per the project design, a backup off-grid captive diesel electricity generator (fueled by diesel) is also used as an electricity supply source to the project activity whenever there are temporary interruptions on the supply of grid-sourced electricity to the project activity. Within the considered monitoring period, the installed backup electricity generator (fueled by diesel) was used to meet the project's electricity demand during limited time instants along different months.

Consumption of Liquefied Petroleum Gas (LPG) by project activity:
Consumption of very low amount of fossil-fuel Liquefied Petroleum Gas (LPG) was potentially expected to occur as part of the operation of the project activity during the considered monitoring period since LPG could, as an option, be used as an alternative start-up fuel for igniting the flares (whenever their operation needs to the reestablished (e.g. after maintenance/repair events)) as per the project design description outlined in the PDD. While collected LFG has been used as primary fuel for starting-up/igniting the

operational high temperature enclosed flares, no consumption of LPG thus occurred during the considered monitoring period[3].

A.2. Location of project activity

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The project activity is implemented at the AMC landfill. This landfill is located in a suburban rural region of the city of Salvador (about 20 km towards North-East direction from the city's central region). The AMC landfill is located within the limits of the city of Lauro de Freitas, which is a satellite city to the city of Salvador in Bahia State, Brazil.

Address of the AMC landfill:
Cia. Aeroporto, Road, km 6,5.

The project site has the following geographical coordinates:

- 12º51'45" S (-12.8625)
- 38º21'59" W (-38.3636)

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Brazil (host)	Bahia Transferência e Tratamento de Resíduos S.A.	No
Switzerland	BELEKTRON d.o.o.	No

A.4. References to applied methodologies and standardized baselines

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The project activity applies the following large-scale CDM baseline and monitoring methodology:

- ACM0001 – "Flaring or use of landfill gas" (version 19.0). (https://cdm.unfccc.int/methodologies/DB/JPYB4DYQUXQPZLBDVPHA87479EMY9M)

[3] In each one of the operational flares, the main fuel line for the auxiliary flame-based system that supports/allow the flare burner ignition includes a manually selectable switching valve from which an upstream thin LPG supply line or an upstream thin LFG supply line can alternately selected as the start-up fuel line for flare burner ignition as part of each event of flare operation starting. In each flare, both the thin LPG supply line and the thin LFG supply line include appropriate pressure reduction valves and other elements which allow the selected start-up fuel (LPG or LFG) being combusted in auxiliary flame-based system under pressure and very flow that are required for the starting-up process of the flare under conformance with its functioning design. Upon the occurred replacement in June/2011 of the previously installed pressure reduction valve in the thin LFG supply line by a new valve (with improved/appropriate functioning and design), it finally became more reliable and safer to use LFG as primary start-up fuel, thus displacing use of LPG as start-up fuel for the flares. The use of very low amount of collected LFG as start-up fuel in high temperature enclosed flares is common practice in well-designed LFG collection and destruction initiatives across the world (incl. project-based initiatives under the CDM). In the particular case of the flares of the project activity, in each individual flare operation starting event, the thin LFG supply line (or the thin LPG supply line as an alternative) supply relatively small amount of LFG for keeping the small flame of the auxiliary flame-based system lid (typically about 5 minutes). Moreover, it is relevant to note that, for each operational flare, LFG is injected in the thin LPG supply line for the auxiliary flame-based system used for flare ignition from a LFG supply points within the project's main LFG pipeline which is located upstream to the location within the pipeline where the installed LFG flow meter sets for measuring amount of LFG sent to the project's methane destruction devices are located. Thus, no emission reduction associated with such relatively very low consumption of LFG in each individual flare starting process is accounted. This is conservative. It is also important to note that the use of LPG as start-up fuel is still being available as a backup alternative (e.g. in case of any required planned or unplanned maintenance/repair work in the LFG supply line for igniting the flare). While no LPG was not consumed during the considered monitoring period, LPG was indeed widely used as a start-up fuel for the flares prior to the above referred replacement of the pressure reduction valve in the LFG in June/2011 (as reported in 4 previously compiled and verified Monitoring Reports valid for 1st 7-year crediting period of the project activity ending on 31/12/2010).

For the considered monitoring period, as also established in the PDD, the following methodological tools are also applied:

- "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) (https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v3.0.pdf
- "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (version 03) (https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v3.pdf)
- "Project emissions from flaring (version 03.0) (https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-06-v3.0.pdf);
- "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0) (https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-08-v3.0.pdf);
- "Tool to calculate the emission factor for an electricity system" (version 07.0) (https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07- v7.0.pdf);

A.5. Crediting period type and duration

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From 01/01/2018 to 31/12/2024 (3rd 7-year renewable crediting period).

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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As per the project design, the project's LFG collecting wells positioned in different parts of the AMC landfill are used to extract LFG from the inner section of this well-managed landfill site. At the ending date of the considered monitoring period, the project's LFG collection system was encompassing 235 operational LFG collecting wells (all interconnected through a high-density polyethylene (HDPE) pipeline network). Through such pipeline network, all collected LFG passes through condensation pots where most of the moisture in collected LFG is removed through condensation prior of being sent to the project's methane destruction devices (i.e. set of high temperature enclosed flares and set of 19 internal combustion gas engines) for controlled combustion. The stream of LFG sent to the set internal combustion gas engines passes through additional centrifugal blowers and through a LFG cooling/treatment unit where LFG is cooled in order to meet fuel specification and operational requirements for such set of internal combustion gas engines.

The quantity and quality of collected LFG sent to each one of the high temperature enclosed flares and to each internal combustion gas engine set are measured, recorded and reported as per applicable monitoring guidance of ACM0001 (version 19.0) and the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0) (with Option C being applied). Thus, the determination of the absolute humidity of the gaseous stream is not required. Fraction of CH_4 as well as flow of collected LFG stream sent to the project's methane destruction devices are continuously measured on the same moisture basis.

During the considered monitoring period encompassing the period from 27/05/2018 to 31/12/2018, the project activity encompassed the operation of the following equipment:

- 1 condensation trap to separate liquids in the collected LFG (leachate and condensate);
- 3 centrifugal blowers powered by electric motor (with nameplate power of 125 HP each).

- Set of 2 high temperature enclosed flares manufactured by BTS - Termodinâmica de Sistemas Ltda. The flares are equipped with a pilot flame fuelled by LPG and/or by collected LFG.
- One backup captive off-grid electricity generator (fuelled by diesel) with 700 kVA (560 kW for a power factor of 0.8) of nameplate power generation capacity. As per the project design, this backup off-grid electricity generator is used only for emergency purposes (during temporary situations when the supply of electricity is interrupted to the project activity). The installed backup captive off-grid power generation unit is manufactured by STEMAC S/A Grupos Geradores (Brazil) and is of model G – GMC / 440 V voltage / 60 Hz.
- Set of 19 identical internal combustion gas engines in which collected LFG is combusted. This set of internal combustion gas engines are the basis of 19 state-of-the-art engine-generators set model/series JMS 320 GS manufactured by GE Jenbacher GmbH & Co OHG (with nameplate power generation capacity of 1.06 MW each).
- A LFG cooling/treatment unit (electrical LFG chilling and activated-carbon LFG purification/filtering equipment) through which collected LFG sent to the set of 19 internal combustion gas engines passes.

Details about monitoring instruments/equipment under operation during the considered monitoring period are included in Section C.

Besides of the non-operation of Flare 1 during the whole considered monitoring period, the project activity also faced events when its set of other methane destruction devices became entirely or partially temporarily out of operation due to different reasons (e.g. occurred temporarily interruption of supply of collected LFG to the set of 19 internal combustion gas engines, temporarily interruption in the supply of electricity to the project activity, occurrence of previously planned or unplanned equipment maintenance/repair events, performance regular calibration events, draining of excess of condensate material from the project's LFG pipeline, identification of unexpected problems in the PLC panel, data communication problems, etc.).

Furthermore, it is also crucial to note that due to lack of operational LFG collection infrastructure covering all the whole area of the AMC landfill, the project activity operated under a somehow limited activity level during the whole considered monitoring period (when compared to the quantitative estimates of the project's potential for promoting LFG collection and GHG emission reductions as outlined in the PDD). By taking into account the nameplate installed capacity of the project's operational methane destruction devices vis-à-vis the quantity of LFG collected as part of the project activity, collected LFG has not been combusted in all of the methane destruction devices currently encompassed by the project activity (high temperature enclosed flares + internal combustion gas engines) under their total combined maximum capacity.

The AMC landfill is regarded as a very well-designed and well-managed landfill. It currently applies the best practice available in Brazil in terms of MSW landfilling from both design and operation perspectives. As established by the valid environmental and operational permits for this landfill site, all disposed MSW is covered and levelled with the use of heavy equipment (excavators, compacting equipment, etc.). Furthermore, safety requirements are defined and systematically followed as part of the operation of the AMC landfill through the application of preventative approach in terms of health and safety. No practice to deliberately increase the amount of methane generated at the AMC landfill has ever been applied. While the implementation and operation of the project activity since year 2004 represents real improvement in terms of LFG management at the landfill (when compared to the situation prior to the implementation of the project activity (baseline scenario)), no qualitative or quantitative change in terms of MSW disposal practice at the AMC landfill was ever promoted or influenced as a result of the implementation and operation of the project activity. Further related details are included in Section D.2 (under details for the monitoring parameter "Management of SWDS").

The AMC landfill is regarded as a very well-designed and well-managed landfill. It currently applies the best practice available in Brazil in terms of MSW landfilling from both design and operation perspectives. As established by the valid environmental and operational permits, all disposed MSW is covered and levelled with the use of heavy equipment (excavators, compacting equipment, etc.). Furthermore, safety requirements are defined and addressed as part of the operation of the UVS-landfill by using a preventative approach. No practice to deliberately increase the amount of methane generated at the AMC landfill has ever been applied. While the implementation and operation of the project activity represents real improvement in terms of LFG management at the landfill (when compared to the situation prior to the implementation of the project activity (baseline scenario)), no change in terms of MSW disposal practice at the AMC landfill was ever promoted or influenced by the project activity. Further details are included in Section D.2 (under details for the monitoring parameter "Management of SWDS").

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

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Not applicable for the considered and/or previous monitoring periods. There are no temporary deviations from the registered monitoring plan and/or applied CDM baseline and monitoring methodology and/or applicable methodological tools encompassed by the considered monitoring period and/or previously approved by the CDM-EB.

In fact, no temporary deviations from the registered monitoring plan and/or applied CDM baseline and monitoring methodology and/or applicable methodological tools were ever addressed in the context of previously performed and approved post-registration changes for the project activity (PRC-0052-001, PRC-0052-002 and PRC-0052-005).

B.2.2. Corrections

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There are no corrections (in information that do not affect the project design) encompassed specifically by the considered monitoring period.

It is however relevant to note that corrections (in information that do not affect the project design) were previously approved (under PRC-0052-001, PRC-0052-002) as changes applicable/valid for monitoring period(s) prior to the considered monitoring period within the currently expired 1st 7-year crediting periods of the project activity (thus not in the context of the verification assessment for the considered monitoring period) as follows:

Ref. of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category "Corrections"
PRC-0052-001	18/07/2014 (Prior approval track)	Corrections (in information that do not affect the project design) in the PDD valid for the currently expired 1st 7-year crediting period of the project activity: (i) Correction of the value for ex-ante determined AM0002's parameter "Conversion Factor" (CF). This parameter represents density for the greenhouse gas methane (CH_4). (ii) Revision of ex-ante estimations of emission reductions

		to be achieved by the project activity during its currently expired 1st 7-year renewable crediting period. This revision is due to the following aspects: - Application of more accurate values for organic content and amount of Municipal Solid Waste (MSW) historically disposed at the AMC landfill; - Use of more appropriate approach for estimating the amount of methane to be generated at the AMC landfill and to be collected by the project activity. Such estimations are performed by applying a more recent and appropriated approach (as per the latest version of the methodological tool "Emission from solid waste disposal sites" in year 20014). - Consideration of leakage emissions due to the consumption of both grid-sourced electricity and LPG by the project activity; - Consideration of the correct value for the AM0002's ex-ante determined parameter CF (density of methane). (iii) Inclusion of descriptions of details of applicable monitoring procedures which are in place since the start of operations of the project activity (in Section B.6.3 – Other elements of monitoring plan) (iv) Major general corrections/improvements in PDD texts and tables (that do not affect the project design) in order to improve the overall comprehension of the following project related aspects: - Description of the project activity and applied technology (including more precise project location details, pictures, schematic figures, etc.) - Description of applied methodological choices (incl. GHG calculations as per AM0002 requirements), - Description of the previously identified baseline scenario + demonstration of additionality, - Description of the previously assessed environmental aspects/impacts - Use of the latest version of the CDM-PDD form (version 04.1) and its completion by applying the latest version of the "Guidelines for completing the Project Design Document form" (version 01.0) - Clarification (added in Appendix 3 of the PDD) about the occurred permanent post-registration changes in the project design which is valid in the context of the later renewed 2nd 7-year crediting period of the project activity (period from 01/01/2011 to 31/12/2017) - Clarification (added in Appendix 6 of the PDD) of the rationale for the relative delay (about 8 years) on addressing the occurred post-registration in a revised version of the PDD.
PRC-0052-002	29/05/2015 (Issuance track)	Corrections (in information that do not affect the project design) in the PDD valid for the currently expired 1st 7-year crediting period of the project activity:

		(i) Inclusion of missing table with monitoring details for the monitoring parameter “Amount of grid electricity consumed by the project activity during the year y” ($EC_{grid,y}$) in Section B.7.1. (ii) Removal of a duplicate table with monitoring details for the monitoring parameter “Quantity of LPG consumed by the project activity” ($FC_{LPG,y}$) from Section B.7.1.

It is also relevant to note that additional corrections (in information that do not affect the project design) were more recently approved (under PRC-0052-005) as changes applicable/valid for monitoring periods from 01/01/2011 onwards (including the considered monitoring period) as independent validation opinion assessment (thus not in the particular context of the verification assessment for the considered monitoring period) as follows:

Ref. of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category “Corrections”
PRC-0052-005	06/12/2018 (Prior approval track)	Corrections (in information that do not affect the project design) in the PDD valid for the currently expired 2nd 7-year crediting period of the project activity: - General text and terminology revision of project description in order to fully comply with the currently applicable requirements for completing the CDM-PDD form (version 10.1) (as established by its attachment “Instructions for completing this form”) and to enhance/improve the project design description. - Minor text improvements (incl. review of statements and correction of previously existent typographic mistakes) in order to improve the overall project description. - Revision of ex-ante estimates of emission reductions to be achieved by the project activity during its 2nd 7-year crediting period (by inter alia jointly taking into account (i) the use of more update and recently available data for estimating applicable values for CO_2 emission factor for the electricity grid (from which grid-sourced electricity is imported) and (ii) the determination of project emissions due to consumption of electricity by the project activity through direct application of Scenario C of the methodological tool “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (version 01)).

B.2.3. Changes to the start date of the crediting period

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Not applicable for the considered and/or previous monitoring periods. There are no changes to start date of the crediting period encompassed by the considered monitoring period and/or previously approved by the CDM-EB. In fact, no change to start date of the crediting period was ever addressed

in the context of any one of the previously performed and approved post-registration changes for the project activity (PRC-0052-001, PRC-0052-002 and PRC-0052-005)[4].

B.2.4. Inclusion of monitoring plan

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Not applicable for the considered and/or previous monitoring periods. There is no inclusion of monitoring plan (and/or applicable methodological tools) encompassed by the considered monitoring period and/or previously approved by the CDM-EB as being applicable for the considered monitoring period. In fact, no inclusion of monitoring plan was ever addressed in the context of previously performed and approved post-registration changes for the project activity (PRC-0052-001, PRC-0052-002 and PRC-0052-005).

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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There are no permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied CDM baseline and monitoring methodology and/or applicable methodological tools encompassed specifically by the considered monitoring period.

It is however relevant to note that permanent changes from the registered monitoring plan and/or permanent deviations of monitoring from the applied methodology were previously approved (under PRC-0052-001) as changes applicable/valid for monitoring period(s) within the currently expired 1st 7-year crediting period of the project activity prior to the considered monitoring period (thus not in the particular context of the verification assessment for the considered monitoring period) as follows:

Ref. of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category "Permanent changes to the registered monitoring plan, or permanent deviation of monitoring form the applied methodologies, standardized baselines, or other applied standards or tools"
PRC-0052-001	18/07/2014 (Prior approval track)	(i) More appropriate approach for monitoring parameters required for determining leakage emissions due to the consumption of grid-sourced electricity by the project activity (as per the latest version of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" valid in year 2014) (with related calculation approach also being included in the PDD in Section B.6.1 - Explanation of methodological choices); (ii) Appropriate approach for monitoring parameters required for determining leakage emissions due to the consumption of fossil fuel LPG by the project activity (as per the latest version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion") (with related calculation approach also being included in the PDD in Section B.6.1 - Explanation of methodological choices); (iii) Appropriate approach for determining project emissions from residual methane emissions due to

[4] The previously performed assessments and request of approval of post-registration changes for the project activity under ref. PRC-0052-003 and PRC-0052-004 were rejected by the CDB-EB. The rejected PRC-0052-003 and PRC- 0052-004 represent previous attempts to address the same post-registration changes that were finally later approved under PRC-0052-005 on 06/12/2018.

		flaring of LFG by the project activity (based on monitoring the CH_4 combustion efficiency in the project's high temperature enclosed flares) (with related calculation approach also being included in the PDD in Section B.6.1 - Explanation of methodological choices); (iv) More appropriate approach for determining the annual amount of methane that would be destroyed in the baseline scenario (absence of the project activity) (with related calculation approach also being included in the PDD in Section B.6.1 - Explanation of methodological choices). All of the above summarized changes were made in the PDD valid for the 1st 7-year crediting period of the project activity.

It is also relevant to note that permanent changes in the monitoring plan were more recently approved (under PRC-0052-005) as changes applicable/valid for monitoring periods from 01/01/2011 onwards (including the considered monitoring period) as independent validation opinion assessment (thus not in the particular context of the verification assessment for the considered monitoring period) as follows:

Ref. of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category "Permanent changes to the registered monitoring plan, or permanent deviation of monitoring form the applied methodologies, standardized baselines, or other applied standards or tools"
PRC-0052-005	06/12/2018 (Prior approval track)	Permanent changes from the registered monitoring plan: - Revision of the applied monitoring and GHG calculation approaches by including additional monitoring requirements and calculation approaches for determining the following GHG emissions as a result of the occurred changes in the project design: (i) Baseline emissions for methane (due to destruction of LFG (rich in methane) also occurring in the set of 19 identical internal combustion gas engines (which are regarded as additional/alternative methane destruction devices for the project activity); (ii) Project emissions (due to the consumption of electricity sourced by the installed backup captive off-grid electricity generator (fuelled by diesel)). Project emissions due to consumption of electricity (sourced by the grid and/or installed backup electricity generator (fuelled by diesel)) will determined by applying guidance of Scenario C of the methodological tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (version 01). (As a result of the related revision of the applied GHG calculation and monitoring approaches, additional ex-ante determined parameters and parameters monitored ex-post are added (i.e. $Op_{j,h}$, $EF_{EL,captive,y}$, $EF_{EL,grid,y}$, $EC_{PJ,captive,y}$, $FC_{Diesel,y}$, $NCV_{Diesel,y}$, $EF_{CO2,Diesel,y}$, $EG_{Diesel-Generator,y}$, $TDL_{captive,y}$) and parameter $TDL_{grid,y}$ are to be

		monitored ex-post). All of the above summarized changes were made in the PDD valid for the 2nd 7-year crediting period of the project activity.

B.2.6. Changes to project design

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There are no changes to the project design encompassed specifically by the considered monitoring period.

It is however relevant to note that changes to the project design were previously approved under PRC-0052-001 as changes applicable/valid for monitoring period(s) within the currently expired 1st 7-year crediting period for the project activity prior to the considered monitoring period (thus not the particular context of the verification assessment for the considered monitoring period) as follows:

Ref. of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category "Changes to project design"
PRC-0052-001	18/07/2014 (Prior approval track)	Permanent changes in the design of the project activity: (i) Consumption of Liquefied Petroleum Gas (LPG) by the project activity for igniting the installed high temperature enclosed flares (after temporary planned or unplanned interruptions of operation of the flares).

It is also relevant to note that additional permanent changes to the project design were more recently approved (under PRC-0052-005) as changes applicable/valid for monitoring periods from 01/01/2011 onwards (including the considered monitoring period) as independent validation opinion assessment (thus not in the particular context of the verification assessment for the considered monitoring period) as follows:

Ref. of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category "Changes to project design"
PRC-0052-005	06/12/2018 (Prior approval track)	Permanent changes in the design of the project activity: - Inclusion of destruction of methane through combustion of collected LFG in a set of 19 identical internal combustion gas engines since 01/01/2011. While such set of identical gas engines are regarded as additional/alternative methane destruction devices for the project activity and represent major components for a grid-connected 20.1 MW electricity generation infrastructure located within the geographical limits of the AMC landfill; the project activity does not include electricity generation as an additional GHG abatement/mitigation measure for which related GHG emission reductions would be claimed. Thus, methane destruction remains being the only GHG abatement/mitigation measure of the project activity and CO_2 emission associated to generation of electricity (using LFG as renewable energy source) in a grid-connected power generation

		infrastructure are not accountable/claimable as emission reductions part of the project activity. - The use of a backup captive off-grid electricity generator (fuelled by diesel) (with nameplate installed capacity of 700 kVA (560 kW for a power factor of 0.8)) is added as an option for meeting of project's electricity demand since January/2011. All of the above summarized changes were made in the PDD valid for the 2nd 7-year crediting period of the project activity.

B.2.7. Changes specific to afforestation or reforestation project activity

>>
Not applicable.

SECTION C. Description of monitoring system

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DATA ACQUISITION, STORAGE AND MANAGEMENT SYSTEM

As part of the application of the monitoring plan valid for the 3rd and last 7-year crediting period of the project activity (under its current design configuration [5]), monitoring data is automatically measured, processed and recorded with the use of related monitoring instruments/equipment, two programmable logic controller (PLC) units [6] and a database (with design and configuration customized for the project activity under its current design configuration). All of such data measurement and processing infrastructure is integrated/linked to a data supervisory system of which design and configuration is also appropriately customized for the project activity. With exception of data related to consumption of electricity, diesel and LPG by the project activity, every-minute continuous monitoring measures for the project activity are processed, recorded and archived by the use of such PLC units and database.

As part of the implemented data reporting and emission reduction calculation procedures, files with raw data (primary monitoring data) are generated for each month of considered monitoring period. Generated files with raw-data includes monitoring records valid for every single minute encompassed by every month which is part of the considered monitoring period. Monitoring data retrieved from the project monitoring database is exported/reported in MS-Excel format and are then handled as a primary data input for the performance of emission reduction calculations. Through the application of a systematic working procedure, retrieved monitoring data is used as input data for the compilation of monthly emission reduction calculation spreadsheets with values of LFG flow sent to the project's methane devices. Such monthly emission reduction calculation spreadsheets are all enclosed to this Monitoring Report. A summarized emission reduction calculation spreadsheet (that calculates the achieved emission reduction for the considered monitoring period by *inter alia* taking into account calculation results from the monthly spreadsheets) is also enclosed to this Monitoring Report.

[5] As further explained in Section A.1, the current project design configuration includes methane destruction in the set of 19 identical internal combustion gas engines which has been operated as additional methane destruction devices for the project activity since January/2011.

[6] One PLC unit has been used since the start of operations of the project activity in year 2004 for processing signals from monitoring instruments/equipment of the project's LFG collection and flaring infrastructure. One additional PLC unit has been used since January/2011 for processing signals from monitoring instruments/equipment related to combustion of collected LFG in the set of 19 internal combustion gas engines. Monitoring data processed by both of such PLC units are simultaneously recorded in the project's database and can be co-visualized in the project's supervisory system (that was updated for the project's design configuration in place since January/2011).

The project's data supervisory system includes in its user interface functionalities that allow regular retrieval of monitoring data for the generation of MS-Excel format files with raw-data.

As per the project's operational procedure valid for its 3rd and last 7-year crediting period, the following routine (stepwise procedure) is monthly performed by the project operational staff in order to appropriately gather + report monitoring records and calculate achieved emission reductions for the period:

1) Every month, a MS-Excel format spreadsheet data file with monitoring records (raw data files) is generated as part of regular retrieval of archived monitoring data for the project activity by using available functionality of the project's supervisory system. Each generated raw data file includes monitoring data reported for a full month.

2) The content of every-month raw data file (in MS-Excel format) (referred in item 1) is used as input data for the determination of baseline emissions due to combustion of LFG by the project activity in its operational methane destruction devices. A customized and pre-formatted monthly MS-Excel format emission reduction calculation spreadsheet template/model (designed by the project participant BATTRE and UniCarbo Energia e Biogás Ltda.[7]) is applied. This MS-Excel based template is internally denominated as *"MMYYYY"*, where *"MM"* is the number of the month and "*YYYY*" is the year of the input data.

As per applicable and currently valid documented working procedures, the project activity is managed by an appointed CDM Project Superintendent at BATTRE. The CDM Project Superintendent supervises the CDM Project supervisor who is the one in charge monitoring related activities (handling of data, preparation of the Monitoring Report and emission reduction calculation spreadsheets). Both the CDM Project Superintendent and the CDM Project supervisor are fully supported by CDM specialists (consultants) from the hired CDM consultancy/advisory company UniCarbo Energia e Biogás Ltda.

The operation of the project activity and the application of the monitoring plan is responsibility of the CDM Project Supervisor, who reports all relevant project related issues to the CDM Project Superintendent (operation status of the project activity, results and events, collection and storage of monitoring data, calibration events, and maintenance of equipment). The CDM specialists (consultants/advisors from UniCarbo) also support the project team in operational and monitoring related issues.

The project's operational and management structure relies on trained staff with responsibilities clearly defined. All collaborators and employees involved with operation of project activity and/or its monitoring are trained internally and/or externally. Training efforts includes *inter alia*:

a) General competence development about generation, collection of LFG;
b) General competence development about combustion of collected LFG in both flares and internal combustion gas engines (methane destruction devices)
c) Review of equipment operational principles and captors;
d) Maintenance and calibration requirements for project's related equipment/instruments;
e) Procedures for data monitoring (incl. data gathering, data handling and data archiving);
f) Emergency and safety procedures.

[7] UniCarbo Energia e Biogas Ltda (UniCarbo) (www.unicarbo.com.br) has provided CDM consultancy/advisory services to BATTRE. UniCarbo is not a project participant.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	OX_{top_layer}
Unit	Dimensionless
Description	Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline
Source of data	Consistent with how oxidation is accounted for in the methodological tool "Emissions from solid waste disposal sites" (version 08.0)
Value(s) applied	0.1
Choice of data or measurement methods and procedures	Default value as per the applied CDM baseline and monitoring methodology ACM0001 "Flaring or use of landfill gas" (version 19.0)
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	GWP_{CH4}
Unit	tCO_2/tCH_4
Description	Global Warming Potential of CH_4
Source of data	The PDD refers to the "Global Warming Potential for Given Time Horizon" in table 2.14 of the errata to the contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, based on the effects of greenhouse gases over a 100-year time horizon. Information is available online: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14 The applied value is also in accordance with the "Standard for application of the global warming potential to clean development mechanism project activities and programmes of activities for the second commitment period of the Kyoto Protocol"
Value(s) applied	25
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The applied value shall be updated according to any future COP/MOP decisions and/or decision by the CDM-EB.

Data/Parameter	**R_u**
Unit	$Pa.m^3/kmol.K$
Description	Universal ideal gases constant
Source of data	The PDD refers to the default value as per the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0).
Value(s) applied	8,314
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**MM_k**
Unit	Kg/kmol
Description	Molecular mass of gas *k*
Source of data	The PDD refers to the default value as per the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0).
Value(s) applied	As outlined in the PDD, for considered gases *k* that are greenhouse gases (GHGs), the values in the table below are applied for MM_k. The following is defined by the applied methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0): *"The determination of the molecular mass of the gaseous stream ($MM_{t,db}$) requires measuring the volumetric fraction of all gases (k) in the considered gaseous stream. However as a simplification, only the volumetric fraction of gases k that are greenhouse gases and are considered in the emission reduction calculation in the underlying methodology must be monitored and the difference to 100% may be considered as pure nitrogen. The simplification is not acceptable if it is differently specified in the underlying methodology*." ACM0001 (version 19.0) does not include any restriction to such simplification. Thus, only the volumetric fraction of gases that are greenhouse gases and are considered in related calculations (CH_4 in the particular case of the project activity) should be considered and the difference to 100% is just considered as pure nitrogen.

Compound	Structure	Molecular mass (kg/kmol)
Nitrogen	N_2	28.01

Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**MM_i**
Unit	kg/kmol
Description	Molecular mass of greenhouse gas *i*
Source of data	The PDD refers to the default value as per the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0).
Value(s) applied	As outlined in the registered PDD, the following value of molecular mass is applicable for CH_4 (the only GHG which is considered):

Compound	Structure	Molecular mass (kg/kmol)
Methane	CH_4	16.04

Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**P_n**
Unit	Pa
Description	Total pressure at normal conditions
Source of data	The PDD refers to the default values as per the methodological tool "Tool to determine the mass flow of greenhouse gas in a gaseous stream" (version 03.0).
Value(s) applied	101,325
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	MM_{H2O}
Unit	Kg/kmol
Description	Molecular mass of water
Source of data	The PDD refers to the default value as per the methodological tool “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (version 03.0).
Value(s) applied	18.0152
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	T_n
Unit	K
Description	Temperature at normal conditions
Source of data	The PDD refers to the default value as per the methodological tool “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (version 03.0).
Value(s) applied	273.15
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	w_{BM}
Unit	%
Description	Weighting of build margin emissions factor
Source of data	Applicable default value as per the methodological tool “Tool to calculate the emission factor for an electricity system” (version 07.0)
Value(s) applied	0.75 (75%)

Choice of data or measurement methods and procedures	The applicable value valid for 3rd crediting period as per the methodological tool "Tool to calculate the emission factor for an electricity system" (version 07.0) is selected.
Purpose of data/parameter	Calculation of project emissions.
Additional comments	It is relevant to note that, as further explained in Section E.2, for the determination of the CO_2 emission factor for electricity consumed by the project activity, the PDD defines the following generic approach of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) regarding its determination by taking into account the potential sources for consumed electricity: *"Where case C.III has been identified, as a conservative simple approach, the emission factor for electricity generation should be the more conservative value between the emission factor determined as per guidance for scenario A and B respectively. This means that the more conservative value should be chosen between a) the result of applying either option A1 or A2 and b) the result of applying either option B1 or B2."* As further explained in Section E.2, the above-quoted options of the methodological tool (options A1, A2, B1 and B2) are thus all potentially applicable for the determination of $EF_{EL,grid,y} = EF_{EL,captive,y}$ (with the determined value representing the most conservative (higher) value). In this context, the ex-ante determined value for w_{BM} is thus applied for the determination of $EF_{EL,grid,y}$ as per Option A1[8].

Data/Parameter	**w_{OM}**
Unit	%
Description	Weighting of operating margin emissions factor
Source of data	Applicable default value as per the methodological tool "Tool to calculate the emission factor for an electricity system" (version 07.0)
Value(s) applied	0.25 (25%)
Choice of data or measurement methods and procedures	The applicable value for the 3rd crediting period as per the methodological tool "Tool to calculate the emission factor for an electricity system" (version 07.0) is selected.

[8] As further explained in Section E.2, while in the particular case of the considered monitoring period the installed backup captive off-grid electricity generator (fuelled by diesel) was not used and no consumption by the project activity of electricity sourced by such captive power generation source thus occurred during the period, the following is thus applicable:

- Option A1 and Option A2 of the of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) are directly selected and applied for the determination of CO_2 emission factor for consumed electricity (with the most conservative (higher) value being chosen) under conformance with additional guidance included in the PDD (and quoted in Section E.2.).
- Project emissions associated to such consumption of electricity generated with fossil fuel diesel ($PE_{EC,captive,y}$) are directly determined as being null (zero).

Purpose of data/parameter	Calculation of project emissions
Additional comments	It is relevant to note that, as further explained in Section E.2, for the determination of the CO_2 emission factor for electricity consumed by the project activity, the PDD defines the following generic approach of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) regarding its determination by taking into account the sources for consumed electricity: *"Where case C.III has been identified, as a conservative simple approach, the emission factor for electricity generation should be the more conservative value between the emission factor determined as per guidance for scenario A and B respectively. This means that the more conservative value should be chosen between a) the result of applying either option A1 or A2 and b) the result of applying either option B1 or B2."* As further explained in Section E.2, the above-quoted options of the methodological tool (options A1, A2, B1 and B2) are thus all potentially applicable for the determination of $EF_{EL,grid,y} = EF_{EL,captive,y}$ (with the determined value representing the most conservative (higher) value). In this context, the ex-ante determined value for w_{OM} is thus applied for the determination of $EF_{EL,grid,y}$ as per Option A1.

<table>
<tr><td>Data/Parameter</td><td>$SPEC_{flare}$</td></tr>
<tr><td>Data unit</td><td>°C (for temperature values)
Nm^3/h (for LFG flow values)
Number of days (for maintenance schedule interval values)</td></tr>
<tr><td>Description</td><td>Manufacturer’s flare specifications for temperature, flow rate and maintenance schedule.</td></tr>
<tr><td>Source of data</td><td>Flare manufacturer</td></tr>
<tr><td>Value(s) applied</td><td>Flare 1, Flare 2 and Flare 3:
<table>
<tr><th>$SPEC_{flare,flare\ 1}$
$SPEC_{flare,flare\ 2}$
$SPEC_{flare,flare\ 3}$</th><th>Min.</th><th>Max.</th></tr>
<tr><td>Operational LFG flow (for continuous operation):</td><td>500 Nm^3/h</td><td>5,360 Nm^3/h</td></tr>
<tr><td>Required temperature of the exhaust gas of the flare (to ensure LFG destruction (combustion) under high CH_4 destruction efficiency):</td><td>500 °C</td><td>1,200 °C</td></tr>
<tr><td>Required minimum frequency for inspection and maintenance service (incl. inspection in the conditions of the flare isolation ceramics revetment material):</td><td colspan="2">Min. every year (365 days)</td></tr>
<tr><td>Required/recommended minimum frequency for replacement of the flare isolation ceramics revetment material:</td><td colspan="2">after 10 years of regular and appropriate operation</td></tr>
</table></td></tr>
<tr><td>Choice of data or measurement methods and procedures</td><td>As established by the methodological tool “Project emissions from flaring”, the flare specifications and operational + maintenance requirements (as set/recommended by the equipment manufacturer) are documented and considered for the ex-ante determination of applicable values for the parameter $SPEC_{flare}$.
Selected data is to be compared against monitored data related to the operation of the flares, including:
a) Minimum and maximum monitoring records for data regarding inlet LFG flow rate,
(b) Minimum and maximum monitoring records for data of temperature in the exhaust gas of each individual high temperature enclosed flare; and
(c) Duration in days of time periods between maintenance events for each individual high temperature enclosed flare.</td></tr>
<tr><td>Purpose of data</td><td>Data is used for the determination of baseline emissions.</td></tr>
<tr><td>Additional comment</td><td>All flare specification and operation details/requirements are based on information provided by the equipment manufacturer.</td></tr>
</table>

Data/Parameter	**$EF_{EL,captive,y}$**
Unit	tCO_2/MWh
Description	CO_2 emission factor for electricity sourced by the captive off-grid electricity generator in year y
Source of data	Applicable default as per the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) (under option B2 of such methodological tool).
Value(s) applied	1.3
Choice of data or measurement methods and procedures	Data is determined as per applicable guidance of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0).
Purpose of data/parameter	Calculation of project emissions.
Additional comments	-

Data/Parameter	**$EF_{EL,grid,y}$**
Data unit	tCO_2/MWh
Description	CO_2 emission factor for grid-sourced electricity in year y
Source of data	Applicable conservative default value as per the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) (under Option A.2 of such methodological tool).
Value(s) applied	1.3
Choice of data or measurement methods and procedures	Data is determined as per applicable guidance of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0).
Purpose of data	Calculation of project emissions.

Additional comment	-

Ex-ante determined parameters not used in the context of ex-post determination and calculation of emission reductions achieved by the project activity during the considered monitoring period:

The following ex-ante determined parameters (that are also included in the PDD) are not used for the purpose of ex-post determination of baseline emissions and project emissions achieved by the project activity during the considered monitoring period:

- Efficiency of the LFG capture system that will be installed in the project activity (η_{PJ})

- Default value for model correction factor to account for model uncertainties ($\varphi_{default}$)

- Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) (OX)

- Fraction of methane in the SWDS gas (volume fraction) (F)

- Default value for the fraction of degradable organic carbon (DOC) in MSW that decomposes in the SWDS ($DOC_{f,default}$)

- Methane correction factor ($MCF_{default}$)

- Fraction of degradable organic carbon in the waste type *j* (weight fraction) (DOC_j)

- Decay rate for the waste type *j* (kj)

- Weight fraction of the waste type *j* (Wj)

As also outlined in the PDD, data for the above-listed parameters are used only in the context of ex-ante estimation of annual accumulated values for the "Amount of methane in the LFG which is destroyed or utilized by the project activity" ($F_{CH4,PJ,y}$) (in the context of ex-ante estimation of emission reductions to be achieved by the project activity during its 3rd and last 7-year renewable crediting period). Due to that, details for the above-listed parameters are not included in this Section as they are not relevant in the context of determination of emission reductions achieved by the project activity during the considered monitoring period. Relevant details for such not reported parameters are included in Section B.6.2 of the PDD.

D.2. Data and parameters monitored

Data/Parameter	**Management of SWDS**
Unit	Dimensionless
Description	Management of the SWDS
Measured/calculated/ Default	As per the adopted monitoring procedure for the project activity, the management of the AMC landfill is on an at least yearly frequency compared against the previously conceived original construction and operational design for this particular landfill in order to confirm that its overall management and operation (including relevant aspects related to landfilling practice) were not

	deliberately modified with the unique aim to increase generation of methane on site. As part of the performed checking, it is monitored whether any practice aiming to increase methane generation in the landfill has occurred or promoted. As required by ACM0001 (version 19.0), any change in the management of the landfill after the implementation of the project activity should be justified by referring to applicable technical or regulatory specifications.
Source of data	A technical evaluation valid/applicable for the considered monitoring period was performed by the independent 3rd party engineering company "Cepollina Engenheiros Consultores Ltda.". The findings from the latest performed evaluation are reported in a declaration document issued by such company and dated from January/2021 (where the most recent document represents an updated version of the previously issued declaration document (dated from January/2020), thus also including/encompassing the finding from the evaluation the period between the issuance dates of such documents, thus including the largest fraction of the considered monitoring period). As part of the performed technical evaluation, the current configuration and operational conditions of the AMC landfill were compared against the previously conceived design and operational conditions of the landfill prior to the implementation of the project activity on the basis of different sources, including inter alia: - Original design documents of the landfill (as described in the documentation required for all phases of the environmental licensing for the AMC landfill); - Applicable local or national regulations - Expertise and experience of "Cepollina Engenheiros Consultores Ltda." with the AMC landfill. Since year 2003, the engineering advisory and consultancy company "Cepollina Engenheiros Consultores Ltda." has performed regular technical inspections at the AMC landfill (as part of the continuously performed assessment/control of geotechnical stability monitoring for the landfill cells). Continuous monitoring of geotechnical stability at the AMC landfill is regarded as a safety and environmental requirement for the operation of this landfill (as defined by the local environmental authority in the operational license (permit) issued for the AMC landfill).
Value(s) of monitored parameter	As outlined in the latest issued technical evaluation/declaration report dated January/2021, the previously conceived original design of the landfill (that was conceived prior to the implementation of the project activity) is confirmed as not to being modified during the whole period from 01/01/2004 (start date of project's 1st 7-year renewable crediting period) until its issuance date (thus completely covering the monitoring period from 27/05/2018 to 31/12/2018). This most recently issued technical evaluation report confirms that no practices to increase methane generation at the AMC landfill have ever occurred (when compared to management and MSW landfilling practices prior to implementation of the project activity or after its implementation). Aspects, conditions and circumstances related to management of the landfill (e.g. waste disposal, waste covering, waste compacting, management of leachate, draining of rainwater, etc.) were not changed with an aim to increase methane generation on site. It is relevant to note that MSW management business (collection and disposal of MSW) in Brazil (and in other developing and even developed countries) has its own economics, dynamics, politics and related regulations. That makes

	MSW disposal activity for the AMC landfill and other similar landfills in Brazil completely independent from the CDM mechanism and/or potential revenues associated to the commercialization of CERs generated by project based methane destruction/utilization initiatives implemented in landfill sites. In the particular case of the AMC landfill, it is important to note that the landfill was designed and it has operated inter alia as per terms and conditions of the public service concession contracts for MSW management previously established with the Administration of the Municipality of Salvador. The design and operation of the AMC landfill is also under conformance with terms and conditions for the environmental licensing that were previously defined and of which indicators/operational requirements are regularly monitored by the competent environmental authority from São Paulo State (CETESB). While the occurrence of changes in the quantitative condition related to MSW disposal in this landfill (such as the occurred increment in the amount of disposed MSW in the landfill as explained in the PDD) are completely independent from the CDM project activity, the project activity per se does not represent any incentive for promoting a change in the management of the landfill in order to increase the amount of methane generated in the site. The registered CDM project activity does not encompass any MSW management related measures. Currently, there is still no climate change of waste management policy in Brazil which would provide an incentive or a mandate to have MSW being disposed in landfills with better/improved LFG collection / destruction systems (such as the project's LFG collection and destruction system currently implemented at the AMC landfill).
Monitoring equipment	Not applicable. No measuring equipment is used for monitoring management of the AMC landfill.
Measuring/reading/recording frequency	Annual checking is performed.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	As required by ACM0001 (version 19.0), any change in the management of the landfill after the implementation of the project activity will be justified by referring to technical or regulatory specifications and impacts of such changes in the determination of baseline emissions should in this case be taken into account appropriately. Such monitoring requirement will be used for the determination/confirmation of baseline emissions and/or confirmation of the project's implementation as described in the PDD (in terms of operation and management conditions of the landfill from which LFG is combusted).

Data/Parameter	$V_{t,wb,j}$
Unit	m^3 wet gas/h
Description	Volumetric flow of LFG stream in time interval *t* on a wet basis for *j* (where *j* is the LFG delivery pipeline to each internal combustion gas engine and LFG delivery pipeline to each flare).
Measured/calculated/ Default	Measured

Source of data	Continuously measurements are performed by sets of 2 and 19 LFG flow meters which are installed in different positions along the LFG pipeline of the project activity as follows: - 2 identical LFG flow meters (one individual LFG flow meter for each one of the 2 operational high temperature enclosed flares) - 19 identical LFG flow meters (one individual LFG flow meter for each one of the 19 installed internal combustion gas engines)
Value(s) of monitored parameter	While related measurements are performed by installed set of 2 identical LFG flow meters (one flow meter for each flare) + installed set of 19 identical LFG flow meters (one flow meter for each internal combustion gas engine), the monitoring parameter $V_{t,wb,j}$ is thus measured, recorded and reported on the basis of the following 21 sub-parameters: - $V_{t,wb,flare-2}$: Volumetric flow of LFG to Flare 2 - $V_{t,wb,flare-3}$: Volumetric flow of LFG to Flare 3 - $V_{t,wb,engine-1}$: Volumetric flow of LFG to the internal combustion gas engine 1 - $V_{t,wb,engine-2}$: Volumetric flow of LFG to the internal combustion gas engine 2 - $V_{t,wb,engine-3}$: Volumetric flow of LFG to the internal combustion gas engine 3 - $V_{t,wb,engine-4}$: Volumetric flow of LFG to the internal combustion gas engine 4 - $V_{t,wb,engine-5}$: Volumetric flow of LFG to the internal combustion gas engine 5 - $V_{t,wb,engine-6}$: Volumetric flow of LFG to the internal combustion gas engine 6 - $V_{t,wb,engine-7}$: Volumetric flow of LFG to the internal combustion gas engine 7 - $V_{t,wb,engine-8}$: Volumetric flow of LFG to the internal combustion gas engine 8 - $V_{t,wb,engine-9}$: Volumetric flow of LFG to the internal combustion gas engine 9 - $V_{t,wb,engine-10}$: Volumetric flow of LFG to the internal combustion gas engine 10 - $V_{t,wb,engine-11}$: Volumetric flow of LFG to the internal combustion gas engine 11 - $V_{t,wb,engine-12}$: Volumetric flow of LFG to the internal combustion gas engine 12 - $V_{t,wb,engine-13}$: Volumetric flow of LFG to the internal combustion gas engine 13 - $V_{t,wb,engine-14}$: Volumetric flow of LFG to the internal combustion gas engine 14 - $V_{t,wb,engine-15}$: Volumetric flow of LFG to the internal combustion gas engine 15 - $V_{t,wb,engine-16}$: Volumetric flow of LFG to the internal combustion gas engine 16 - $V_{t,wb,engine-17}$: Volumetric flow of LFG to the internal combustion gas engine 17 - $V_{t,wb,engine-18}$: Volumetric flow of LFG to the internal combustion gas engine 18 - $V_{t,wb,engine-19}$: Volumetric flow of LFG to the internal combustion gas engine 19 In the particular case of Flare 1, while this flare and its related monitoring instruments were not operational and/or not even installed at the project site during the considered monitoring period, "0" every-minute values are registered and reported during the whole period for the sub-parameter "Volumetric flow of LFG to Flare 1" ($V_{t,wb,flare-1}$) by the project's database (as defined/set when configurating the project's monitoring database by taking into account the occurred removal of Flare 1 from the project site in March/2012). The set of monthly emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report) includes all every-minute records of measurements of LFG flow sent to each one of the installed 2 operational high temperature enclosed flare valid for the considered monitoring period (records of the sub-parameters $V_{t,wb,flare-2}$ and $V_{t,wb,flare-3}$). Every-minute records of measurements of LFG flow sent to each one of the installed 19 internal combustion gas engines during the considered monitoring

	period (records of the sub-parameters $V_{t,wb,engine-1}$, $V_{t,wb,engine-2}$, (…), $V_{t,wb,engine-19}$) are reported in a separated calculation spreadsheet[9].

[9] As outlined below under "Additional comments" and also presented in Section E.1, differently than the case of records of LFG flow sent to the flares (measurements being performed by 2 LFG flow meters of which design and functioning ensure measurements to be automatically converted in normalized values); the 19 records of measurements of LFG flow sent to each one of the installed 19 internal combustion gas engines during every single minute *m* of the considered monitoring period are required to be converted into normalized values through calculations (by inter alia taking into account records of LFG pressure and LFG temperature (Monitoring parameters P_t and T_t respectively on the basis of the sub-monitoring parameters $P_{t,engine-1}$, $P_{t,engine-2}$, (…), $P_{t,engine-19}$ and sub-monitoring parameters $T_{t,engine-1}$, $T_{t,engine-2}$, (…), $T_{t,engine-19}$ respectively). The reason for such required additional calculations is that related measurements are performed by a set of 19 LFG flow meters of which design and functioning do not allow performed measurements to be automatically converted and recorded/reported into normalized values by the instruments. In order to avoid having each one of the 8 MS-Excel monthly emission reduction spreadsheets becoming with very high/heavy file size (i.e. easily exceeding 150 MB each in case related conversion calculations were included in the 8 MS-Excel monthly emission reduction spreadsheets), every-minute records of measurements of LFG flow sent to each one of the installed 19 internal combustion gas engines during each month of the considered monitoring period are thus converted into normalized values through calculations that are included in 10 separated calculation spreadsheets (1 spreadsheet for each month) for sake of completeness and transparency.

Monitoring equipment	Two identical LFG flow meter sets were used for measuring amount of LFG sent to each operational flare (Flare 2 and Flare 3). Each set encompasses a LFG flow measurement element (Annubar) and a measurement data processing/transmission unit (with continuous measurements from the LFG measurement element, LFG pressure sensor and LFG temperature sensor being continuously processed and resulting on recording and reporting of every-minute values of $V_{t,wb,flare-2}$ and $V_{t,wb,flare-3}$ in Nm_3/h). Measurements of LFG flow sent to each internal combustion gas engine are performed by 19 identical LFG flow meters, with each instrument being installed in an independent section of the LFG pipeline located between the centrifugal blowers and the internal combustion gas engine in question, thus ensuring that flow of LFG sent to each one of the gas engines encompassed by the project activity is independently and continuously measured. <u>*Specifications and calibration details for the LFG flow meters used during the considered monitoring period for measuring the flow of LFG sent to the flares:*</u> A set of 2 identical LFG flow meters is installed and is used for measuring $V_{t,wb,flare-2}$ and $V_{t,wb,flare-3}$: *LFG measurement element:* - Manufacturer: Digimat Montagem e Instrumentação Ltda. - Model: Sonda 4 - Accuracy: ±1% - Serial Numbers: There is no S/N or batch number for the installed annubar elements. - Required Calibration frequency: No regular calibration is required for the annubar elements as per declaration of the equipment manufacturer. Anyhow the manufacturer of the annubar elements recommends a dimensional checking (metrology analysis) in the element every 5 years in order to confirm the dimensional integrity of the instrument (this is a required condition for its proper functioning). No calibration requirements are specified in the monitoring plan of the PDD or ACM0001 (version 19.0) either. - Details for performed calibration events valid for the considered monitoring period: While both flow meter sets were only acquired by BATTRE and installed at the project site on 27/10/2015, no dimensional checking was yet performed in the annubar elements. *Data processing/transmission unit used for measuring $V_{t,wb,flare-2}$:* - Manufacturer: SMAR Equipamentos Ind. Ltda. - Model: LD301 - Accuracy: ±1% - Serial Number (S/N) / period in use within the considered monitoring period: • 292187 / used from 03/03/2020 to 31/12/2020. - Required Calibration frequency: Calibration events are to be performed every year; - Calibration event(s) valid for the considered monitoring period: • For the flowmeter with Serial Number 292187 a valid calibration event was performed on 09/01/2020 (Calibration Certificate Number 6223, issued by Works Serviços Ltda.) valid until 08/01/2021 (1 year). *Data processing/transmission unit used for measuring $V_{t,wb,flare-3}$:* - Manufacturer: SMAR Equipamentos Ind. Ltda.

- Model: LD301
- Accuracy: ±1%
- Serial Number (S/N) / period in use within the considered monitoring period:
    - 136758 / used from 03/03/2020 to 31/12/2020.
- Required Calibration frequency: Calibration events are to be performed every year;
- Calibration event(s) valid for the considered monitoring period:
    - For the flowmeter with Serial Number 136758 a valid calibration event was performed on 09/01/2020 (Calibration Certificate Number 6222, issued by Works Serviços Ltda.) valid until 08/01/2021 (1 year).

Specifications and calibration details for the LFG flow meters used for measuring the flow of LFG sent to the internal combustion gas engines:

A set of 19 identical LFG flow meters (each one incl. a measurement element (annubar) + a pressure signal processing & data transmission unit) are installed and are used for measuring $V_{t,wb,engine-1}$, $V_{t,wb,engine-2}$, (…), $V_{t,wb,engine-19}$.

LFG flow meter used for measuring $V_{t,wb,engine-1}$ (internal combustion gas engine 1):

Measurement element (annubar):
- Manufacturer: Emerson Electric Co. (former Rosemount Inc.)
- Model: Rosemount 3051S (multi-variable differential pressure type) (manufacturer assemble/order number 3051SMV5M11G3R2E12A1AC20C2L4Q4)
- Accuracy: ±1%
- Serial Numbers:

Engine Number	Serial number (S/N) for measurement module	Serial number (S/N) and feature board (for data integration/processing) and transmitter (for data transmission)	
		Feature board	Transmitter
Engine 1 ($V_{t,wb,engine-1}$)	5879827	4005343	51453
Engine 2 ($V_{t,wb,engine-2}$)	5885537	5000590	51429
Engine 3 ($V_{t,wb,engine-3}$)	5874555	5000510	51404
Engine 4 ($V_{t,wb,engine-4}$)	5885525	5000532	51428
Engine 5 ($V_{t,wb,engine-5}$)	5874563	4005332	51462
Engine 6 ($V_{t,wb,engine-6}$)	5879317	5000515	51408
Engine 7 ($V_{t,wb,engine-7}$)	5867514	4005400	51407
Engine 8 ($V_{t,wb,engine-8}$)	5867521	5000613	51451
Engine 9 ($V_{t,wb,engine-9}$)	5867027	4005396	51409
Engine 10 ($V_{t,wb,engine-10}$)	5868222	4005310	51431
Engine 11 ($V_{t,wb,engine-1}$)	5874951	4005368	51410

Engine 12 ($V_{t,wb,engine-12}$)	5879824	4005398	51412
Engine 13 ($V_{t,wb,engine-13}$)	5879820	4005366	51428
Engine 14 ($V_{t,wb,engine-14}$)	5867028	4005337	51450
Engine 15 ($V_{t,wb,engine-15}$)	4005331	4005331	51430
Engine 16 ($V_{t,wb,engine-16}$)	5874958	4005372	51411
Engine 17 ($V_{t,wb,engine-17}$)	5874950	5000587	51462
Engine 18 ($V_{t,wb,engine-18}$)	5879733	5000616	51405
Engine 19 ($V_{t,wb,engine-19}$)	5879822	4004957	51461

- Required Calibration frequency for the sets: Calibration events are to be performed every 1 year in the in the multi-variable flow meter sets.
- Details for performed calibration events in the sets valid for the considered monitoring period:

Engine Number for which the set is installed/positioned	Date of performed calibration event	Validity of the performed calibration	Entity/company responsible for performing the calibration event	Number/reference of issued Calibration Certificate
Engine 1	02/05/2019	01/05/2020	Cermantech Manutenção Industrial	BT-011-19
	08/05/2020	07/05/2021	Cermantech Manutenção Industrial	BT-020-20
Engine 2	11/02/2020	10/02/2021	Cermantech Manutenção Industrial	BT-002-20
Engine 3	23/04/2019	22/04/2020	Cermantech Manutenção Industrial	BT-017-19
	23/04/2020	22/04/2021	Cermantech Manutenção Industrial	BT-019-20
Engine 4	11/02/2020	10/02/2021	Cermantech Manutenção Industrial	BT-003-20
Engine 5	23/04/2019	22/04/2020	Cermantech Manutenção Industrial	BT-016-19
	23/04/2020	22/04/2021	Cermantech Manutenção Industrial	BT-018-20
Engine 6	20/03/2019	19/03/2020	Cermantech Manutenção Industrial	BT-003-19
	19/03/2020	18/03/2021	Cermantech Manutenção Industrial	BT-004-20
Engine 7	19/04/2019	18/04/2020	Cermantech Manutenção Industrial	BT-015-19

	22/04/2020	21/04/2021	Cermantech Manutenção Industrial	BT-017-20
Engine 8	23/03/2019	22/03/2020	Cermantech Manutenção Industrial	BT-004-19
	23/03/2020	22/03/2021	Cermantech Manutenção Industrial	BT-005-20
Engine 9	12/04/2019	11/04/2020	Cermantech Manutenção Industrial	BT-014-19
	22/04/2020	21/04/2021	Cermantech Manutenção Industrial	BT-016-20
Engine 10	04/04/2019	03/04/2020	Cermantech Manutenção Industrial	BT-005-19
	10/04/2020	09/04/2021	Cermantech Manutenção Industrial	BT-006-20
Engine 11	15/04/2019	14/04/2020	Cermantech Manutenção Industrial	BT-013-19
	14/04/2020	13/04/2020	Cermantech Manutenção Industrial	BT-015-20
Engine 12	04/04/2019	03/04/2020	Cermantech Manutenção Industrial	BT-006-19
	06/04/2020	05/04/2021	Cermantech Manutenção Industrial	BT-007-20
Engine 13	18/04/2019	17/04/2020	Cermantech Manutenção Industrial	BT-012-19
	17/04/2020	16/04/2021	Cermantech Manutenção Industrial	BT-014-20
Engine 14	04/04/2019	03/04/2020	Cermantech Manutenção Industrial	BT-007-19
	10/04/2020	09/04/2021	Cermantech Manutenção Industrial	BT-008-20
Engine 15	10/04/2019	09/04/2020	Cermantech Manutenção Industrial	BT-009-19
	20/04/2020	19/04/2021	Cermantech Manutenção Industrial	BT-013-20
Engine 16	05/04/2019	04/04/2020	Cermantech Manutenção Industrial	BT-008-19
	10/04/2020	09/04/2021	Cermantech Manutenção Industrial	BT-009-20
Engine 17	08/04/2019	07/04/2020	Cermantech Manutenção Industrial	BT-010-19

		20/04/2020	19/04/2021	Cermantech Manutenção Industrial	BT-012-2020
	Engine 18	04/04/2019	03/04/2020	Cermantech Manutenção Industrial	BT-018-19
		24/04/2020	23/04/2021	Cermantech Manutenção Industrial	BT-010-20
	Engine 19	08/04/2019	07/04/2021	Cermantech Manutenção Industrial	BT-019-19
		20/04/2020	19/04/2021	Cermantech Manutenção Industrial	BT-011-20

Measuring/reading/recording frequency	Continuous measurements are recorded and reported with every-minute frequency.
Calculation method (if applicable)	Not applicable
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The design and functioning of the installed monitoring instruments and related additional monitoring infrastructure (2 LFG flow meter sets (one for each one of the 2 operational flare) + 19 LFG flow meter sets (one set for each one of the 19 internal combustion gas engine) + measurement processing infrastructure) ensure that all LFG flow measurement data are automatically processed, recorded and reported in normal cubic meters per hour (Nm^3/h). Due to that, as explained in Section E.1, reporting or measurement records of LFG pressure and LFG temperature are not required for calculating normalized LFG flow values of the calculation sub-parameters $V_{t,n,wb,Flare-2}$, $V_{t,n,wb,Flare-3}$ and $V_{t,n,wb,engine-n}$ (where engine-n = engine-1, engine-2, (…), engine-19) in the context of calculation of emission reductions achieved by the project activity. By taking into account the applied monitoring solution in terms of processing, recording and reporting of LFG flow related data, reported values of the sub-parameters $V_{t,,wb,Flare-2}$, $V_{t,wb,Flare-3}$ and $V_{t,wb,engine-n}$ are thus directly assumed as equivalent to values of $V_{t,n,wb,Flare-2}$, $V_{t,n,wb,Flare-3}$ and $V_{t,n,wb,engine-n}$ in the context of the determination of the amount of methane destroyed by the project activity ($F_{CH4,PJ,y} = F_{CH4,flared.y} + F_{CH4,EL.y}$).

Data/Parameter	**$V_{CH4,t,wb}$**
Unit	m^3CH_4/m^3 wet gas

Description	Volumetric fraction of CH_4 in the collected LFG in time interval t on a wet basis
Measured/calculated/ Default	Measured
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instruments (continuous CH_4 content gas analyser) with recordable electronic signal).
Value(s) of monitored parameter	The set of 6 monthly emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report) includes measurement data for $v_{CH4,t,wb}$ that are recorded and reported for with an every-minute frequency.

Monitoring equipment	*Specifications and calibration details for the installed continuous CH_4 content gas analyser:* - Manufacturer: Emerson Electric Co. (former Rosemount Inc.) - Model: X-STREAM X2 Series - Accuracy: ±2% - Serial Number: NS 53159 - Required calibration frequency: Calibration events are to be performed every 2 weeks. - Dates and validity of performed calibration events valid for the considered monitoring period: • Calibration event dated 25/02/2020 (valid until 10/03/2020); • Calibration event dated 02/03/2020 (valid until 16/03/2020); • Calibration event dated 10/03/2020 (valid until 24/03/2020); • Calibration event dated 23/03/2020 (valid until 06/04/2020); • Calibration event dated 30/03/2020 (valid until 13/04/2020); • Calibration event dated 08/04/2020 (valid until 22/04/2020); • Calibration event dated 20/04/2020 (valid until 04/05/2020); • Calibration event dated 27/04/2020 (valid until 11/05/2020); • Calibration event dated 05/05/2020 (valid until 19/05/2020); • Calibration event dated 18/05/2020 (valid until 01/06/2020); • Calibration event dated 30/05/2020 (valid until 13/06/2020); • Calibration event dated 08/06/2020 (valid until 22/06/2020); • Calibration event dated 15/06/2020 (valid until 29/06/2020); • Calibration event dated 21/06/2020 (valid until 05/07/2020); • Calibration event dated 29/06/2020 (valid until 13/07/2020); • Calibration event dated 06/07/2020 (valid until 20/07/2020); • Calibration event dated 13/07/2020 (valid until 27/07/2020); • Calibration event dated 20/07/2020 (valid until 03/08/2020); • Calibration event dated 27/07/2020 (valid until 10/08/2020); • Calibration event dated 03/08/2020 (valid until 17/08/2020); • Calibration event dated 10/08/2020 (valid until 24/08/2020); • Calibration event dated 17/08/2020 (valid until 31/08/2020); • Calibration event dated 24/08/2020 (valid until 07/09/2020); • Calibration event dated 31/08/2020 (valid until 14/09/2020); • Calibration event dated 07/09/2020 (valid until 21/09/2020); • Calibration event dated 14/09/2020 (valid until 28/09/2020); • Calibration event dated 21/09/2020 (valid until 05/10/2020); • Calibration event dated 28/09/2020 (valid until 12/10/2020); • Calibration event dated 05/10/2020 (valid until 19/10/2020); • Calibration event dated 12/10/2020 (valid until 26/10/2020); • Calibration event dated 22/10/2020 (valid until 05/11/2020); • Calibration event dated 27/10/2020 (valid until 10/11/2020); • Calibration event dated 05/11/2020 (valid until 19/11/2020); • Calibration event dated 16/11/2020 (valid until 30/11/2020); • Calibration event dated 30/11/2020 (valid until 14/12/2020); • Calibration event dated 04/12/2020 (valid until 18/12/2020); • Calibration event dated 18/12/2020 (valid until 01/01/2021); • Calibration event dated 28/12/2020 (valid until 11/01/2021); - Entity/company responsible for performing the calibration events: all calibration events were performed by trained/accredited responsible staff of the project participant BATTRE by following applicable internal working procedures. Calibration events valid for the considered monitoring period were performed by using certified span gas cylinders with a known CH4 composition. Certified span gases utilized for performing the calibration events valid for the considered monitoring period: - Gas cylinders with a calibration mixture of 50.00 cmol/mol of CH4 and 50.00 cmol/mol of CO2: cylinder n° 137639, certificate number 846/15 supplied by Linde Gases Ltda.

	- Gas cylinders with a calibration mixture of 50.00 cmol/mol of CH4 and 50.00 cmol/mol of CO2: cylinder n° 10295, certificate number 1150/16 supplied by Linde Gases Ltda. - Gas cylinders with a calibration mixture of 50.01 cmol/mol of CH4 and 49.99 cmol/mol of CO2: cylinder n° 29756, certificate number 110/17 supplied by Linde Gases Ltda. - Gas cylinders with a calibration mixture of 50.01 cmol/mol of CH4 and 49.99 cmol/mol of CO2: cylinder n° 112312, certificate number 3727/17 supplied by Linde Gases Ltda.
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**T_t**
Unit	K
Description	Temperature of the LFG stream in time interval *t*
Measured/calculated/ Default	Measured
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instrument (LFG temperature sensors with recordable electronic signal). Measurements of LFG temperature are primarily recorded and reported in ^oC. Recorded/reported data is converted into Kelvin (K) and data is also reported in this unit, thus meeting the related monitoring requirement as per the PDD.
Value(s) of monitored parameter	The set 6 monthly emission reduction calculation spreadsheets (that is enclosed to this Monitoring Report) includes measurement data for T_t that are recorded and reported with an every-minute frequency.
Monitoring equipment	*Specifications and calibration details for the LFG temperature sensor used for measuring LFG temperature:* - Manufacturer: SMAR Equipamentos Ind. Ltda. - Model: TT-301 - Accuracy: ±1% - Serial Number (S/N): 67895 - Required calibration frequency: calibration events are to be performed yearly - Date(s) and validity for performed calibration event(s) valid for the considered monitoring period: - Calibration event dated 28/05/2019 (Calibration Certificate 67962/16, issued by Works Serviços), valid until 27/05/2020. - Calibration event dated 26/05/2020 (Calibration Certificate 6480, issued by Works Serviços), valid until 25/05/2021.
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of baseline emissions

Additional comments	The design and functioning of installed flow meter sets and related measurement processing instruments (i.e. 2 LFG flow meter sets for the flares (one for each one of the 2 operational flares) + 19 LFG flow meter sets for the internal combustion gas engines (one set for each one of the 19 gas engines)) ensure that all every-minute LFG flow measurement data is automatically processed, recorded and reported in normal cubic meters per hour (Nm3/h). Due to that, as further explained in Section E.1, measurements of LFG pressure and LFG temperature are not required for converting reported LFG flow measurement values into in normal cubic meters per hour (Nm^3/h) as part of emission reduction calculations since reported values of the calculation sub-parameters $V_{t,wb,Flare-2}$, $V_{t,wb,Flare-3}$ and $V_{t,wb,engine-n}$ (where engine-n = engine-1, engine-2, (…), engine-19) already correspond to values of $V_{t,n,wb,Flare-2}$, $V_{t,n,wb,Flare-3}$ and $V_{t,n,wb,engine-n}$ (where engine-n = engine-1, engine-2, (…), engine-19) respectively. Nonetheless, available every-minute measurement records of LFG temperature are anyway reported in the monthly emission reduction calculation spreadsheets for sake of transparency and completeness.

Data/Parameter	**P_t**
Unit	Pa
Description	Pressure of the LFG stream in time interval *t*
Measured/calculated/ Default	Measured
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instrument (LFG pressure sensor with recordable electronic signal). Measurements of LFG pressure are primarily recorded and reported in millibars (mbar). Recorded/reported data is converted into Pascal (Pa) and data is also reported in this unit, thus meeting the related monitoring requirement as per the PDD.
Value(s) of monitored parameter	The set 6 monthly emission reduction calculation spreadsheets (that is enclosed to this Monitoring Report) includes measurement data for P_t that are recorded and reported with an every-minute frequency.

Monitoring equipment	Measurements of pressure of LFG are performed by one installed LFG pressure sensor (that is installed in the main LFG pipeline). *Specifications and calibration details for the LFG pressure sensor used for measuring LFG pressure:* - Manufacturer: Pressgage instrumentos de Medição e Controle Ltda. - Model: TPI-PRESS - Accuracy: ±1.5% - Serial Number: 185053 - Required calibration frequency: calibration events are to be performed yearly. - Date(s) and validity for performed calibration event(s) valid for the considered monitoring period: - Calibration event dated 10/05/2016 (Calibration Certificate 67962/16, issued by Medição Soluções Metrológicas Integradas Ltda.), valid until 09/05/2017 - Calibration event dated 08/05/2017 (Calibration Certificate BC-020, issued by Bahia Control Comercio Representaçoes e Serviços Ltda.), valid until 07/05/2018 - Calibration event dated 07/05/2018 (Calibration Certificate 4296, issued by Works Serviços Ltda.), valid until 06/05/2018
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

<table>
<tr><td>Data/Parameter</td><td>$EC_{PJ,grid,y}$</td></tr>
<tr><td>Unit</td><td>MWh</td></tr>
<tr><td>Description</td><td>Amount of grid electricity consumed by the project activity during the year y</td></tr>
<tr><td>Measured/calculated/ Default</td><td>Measured.</td></tr>
<tr><td>Source of data</td><td>Measured as part of the operation of the project activity by applying appropriate monitoring instrument (one electricity meter with recordable electronic signal).</td></tr>
<tr><td>Value(s) of monitored parameter</td><td>Monthly records of grid-sourced electricity consumption valid for the considered monitoring period:
<table>
<tr><th>Month</th><th>Amount of consumed grid-sourced electricity (MWh)</th></tr>
<tr><td>May./2018 (from 27/05 to 31/05/2018)</td><td>17.221</td></tr>
<tr><td>Jun./2018</td><td>97.486</td></tr>
<tr><td>Jul./2018</td><td>112.398</td></tr>
<tr><td>Aug./2018</td><td>117.591</td></tr>
<tr><td>Sep./2018</td><td>108.030</td></tr>
<tr><td>Oct./2018</td><td>113.384</td></tr>
<tr><td>Nov./2018</td><td>106.431</td></tr>
<tr><td>Dec./2018</td><td>109.105</td></tr>
</table></td></tr>
</table>

Monitoring equipment	*Specifications and calibration details for the electricity meter used alternately for measuring consumption of grid-sourced electricity:* - Manufacturer: KRON Instrumentos Elétricos Ltda. - Model: MULTIMEDIDOR MKM-D - Accuracy: ±0.2% - Serial Number (S/N): 672850 - Required calibration frequency (as specified by the monitoring methodology/ methodological tool): As per the PDD, all monitoring equipment must be calibrated periodically. The "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" establishes the following regarding maintenance and calibration for electricity meters: "*(...) meters should be installed, maintained and calibrated according to equipment manufacturer instructions and be in line with national standards, or, if these are not available, international standards (e.g. IEC, ISO)*". - Calibration frequency (as per the recommendation of the meter manufacturer): it is important to note that the installed meter is approved/certified by INMETRO (The Brazilian national authority for metrology and standardization issues), and it is thus in conformance with INMETRO's requirements for maintenance and testing of electricity meters. According to the instrument's manufacturer, the meter is to be calibrated every 5 years. A calibration frequency of 5 years is thus adopted. - Date(s) and validity of performed calibration event(s) valid for the considered monitoring period: - Calibration event dated 02/10/2018 valid until 01/10/2023, as indicated in the Calibration Certificate Number 199556780794/18, issued by CEIME Calibração e Comércio de Instrumentos Ltda.
Measuring/reading/recording frequency	Accumulated monthly measurement values for consumption of grid-sourced electricity are recorded once a month.
Calculation method (if applicable)	-
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of project emissions

Additional comments	As outlined in the PDD, all electricity generated by the grid-connected electricity generation infrastructure fuelled by LFG (of which the set of 19 internal combustion gas engines combusting collected LFG represents major components) and consumed by equipment of the project's LFG collection and flaring infrastructure (e.g. centrifugal blowers, control system, monitoring instruments/equipment, etc.) is to be regarded/accounted as consumption of grid-sourced electricity (with related project emissions accounted accordingly) as a conservative approach. Under normal circumstances, very small share of the net-generated electricity by the project's grid-connected electricity generation infrastructure fuelled by LFG is continuously supplied to the equipment of the project's LFG collection and flaring infrastructure, with additional very small share being continuously used for meeting the even smaller electricity demand of other facilities located within the limits of the AMC landfill and with the remaining larger share of net generated electricity being exported to the grid through a high voltage power substation connected to an electricity transmission line within the grid. Under unusual circumstances when the grid-connected electricity generation infrastructure fuelled by LFG is not under operational status (and with supply of grid-sourced electricity to the landfill site under normal conditions), the electricity demand of all equipment of the project's LFG collection and flaring infrastructure is thus directly met by supply of grid-sourced electricity. Under both circumstances, consumption of electricity regarded as supplied by the grid is measured by one common installed electricity meter. The electricity meter used for monitoring the parameter $EC_{PJ,grid,y}$ provides accumulated measurement records for grid-sourced electricity consumed by the project's LFG collection and flaring infrastructure. Accounting all consumption by the project activity of electricity generated by the grid-connected electricity generation infrastructure (fuelled uniquely by LFG) (of which the set of 19 internal combustion gas engines represents major components) represents a conservative measure which is under conformance with the following disclaimer included in the PDD: *"no emission reductions due to displacement of a more-GHG-intensive service (i.e. emission reductions due to generation of electricity using collected LFG as fuel) are thus eligible and/or claimable; any consumption by the project activity of electricity sourced/generated by the grid-connected 20.1 MW electricity generation infrastructure within the geographical limits of the AMC landfill (of which the set of 19 internal combustion gas engines represents the major components) will always be regarded and accounted"* Meeting of electricity demand of the project's LFG collection and flaring infrastructure with electricity generated by installed backup captive off-grid electricity generator is only expected to occur under very unusual and improbable situations when supply of grid-sourced electricity to the landfill site is not available[10]. Under such circumstances, electricity consumption by the project activity is performed by an independent electricity meter located/positioned between such backup captive electricity generator (fuelled by diesel) and the project's equipment within the internal wiring for electricity supply.

[10] Both the project's LFG collection and flaring infrastructure and the grid-connected electricity generation infrastructure fueled by LFG (of which the set of 19 internal combustion represents major components) are connected to the National Electricity Grid of Brazil through a high voltage transmission line which is made very reliable and is well controlled by its electricity transmission/distribution operators (by taking into account its importance for the supply of electricity to São Paulo region). Due to that, interruptions in the supply of grid-sourced electricity to the project activity are regarded as very unusual and improbable.

Data/Parameter	**$Op_{j,h}$**
Unit	-
Description	Operation of the equipment that consumes LFG (i.e. set of internal combustion gas engines (as additional/alternative methane destruction devices)).
Measured/calculated/ Default	For each equipment unit *j* using the LFG monitor that the plant is operating in hour h by the monitoring any one or more of the following three parameters: (a) Temperature. Determine the location for temperature measurements and minimum operational temperature based on manufacturer's specifications of the burning equipment. Document and justify the location and minimum threshold in the PDD; (b) Flame. Flame detection system is used to ensure that the equipment is in operation; (c) Products generated. Monitor the generation of steam for the case of boilers and air-heaters and glass for the case of glass melting furnaces. This option is not applicable to brick kilns. $O_{pj,h}$ = 0 when: (a) One of more temperature measurements are missing or below the minimum threshold in hour h (instantaneous measurements are made at least every minute); (b) Flame is not detected continuously in hour h (instantaneous measurements are made at least every minute); (c) No products are generated in the hour h. Otherwise, $O_{pj,h}$ = 1
Source of data	The electronic control system for each internal combustion gas engine continuously monitors operational status of the engine (internal combustion gas engine under operation "*on*" or not under operation "*off*"), generating recordable electronic signal.

Value(s) of monitored parameter	While the operational status for each individual internal combustion gas engine consuming LFG is independently monitored, the monitoring parameter $O_{pj,h}$ is recorded and reported on the basis of the following sub-parameters: - $Op_{engine-1,h,}$: Operation of the internal combustion gas engine 1 - $Op_{engine-2,h}$: Operation of the internal combustion gas engine 2 - $Op_{engine-3,h}$: Operation of the internal combustion gas engine 3 - $Op_{engine-4,h}$: Operation of the internal combustion gas engine 4 - $Op_{engine-5,h}$: Operation of the internal combustion gas engine 5 - $Op_{engine-6,h}$: Operation of the internal combustion gas engine 6 - $Op_{engine-7,h}$: Operation of the internal combustion gas engine 7 - $Op_{engine-8,h}$: Operation of the internal combustion gas engine 8 - $Op_{engine-9,h}$: Operation of the internal combustion gas engine 9 - $Op_{engine-10,h}$: Operation of the internal combustion gas engine 10 - $Op_{engine-11,h}$: Operation of the internal combustion gas engine 11 - $Op_{engine-12,h}$: Operation of the internal combustion gas engine 12 - $Op_{engine-13,h}$: Operation of the internal combustion gas engine 13 - $Op_{engine-14,h}$: Operation of the internal combustion gas engine 14 - $Op_{engine-15,h}$: Operation of the internal combustion gas engine 15 - $Op_{engine-16,h}$: Operation of the internal combustion gas engine 16 - $Op_{engine-17,h}$: Operation of the internal combustion gas engine 17 - $Op_{engine-18,h}$: Operation of the internal combustion gas engine 18 - $Op_{engine-19,h}$: Operation of the internal combustion gas engine 19 For each one of the 19 installed internal combustion gas engines, records for every-minute operational status of the engine (internal combustion gas engine under operation ("*on*") = 1 or not under operation ("*off*") = 0) are made available in the emission reduction calculation spreadsheets.
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	Values are reported on a minute basis.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation baseline emissions.
Additional comments	In the particular case of the project activity the only equipment that consumes LFG (and for which the monitoring parameter $Op_{j,h}$ is applicable to) are the internal combustion gas engines (additional/alternative destruction methane devices). As per ACM0001 (version 19.0), the monitoring parameter $Op_{j,h}$ is not applicable to the project's high temperature enclosed flares.

Data/Parameter	**$T_{EG,m}$**
Unit	^{o}C
Description	Temperature in the exhaust gas of the enclosed flare in minute *m*
Measured/calculated/ Default	Measured
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instruments (thermocouples) (with recordable electronic signal). Continuously measurements are performed by 2 thermocouples (each thermocouple installed in the upper section of each one of the 2 operational high temperature enclosed flares).
Value(s) of monitored parameter	Values for each one of the installed 2 high temperature enclosed flares are reported in the monthly emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report). Measurement data is recorded and reported with an every-minute frequency. While measurements are performed by 2 thermocouples (one thermocouple installed in the upper section of each individual installed flare), the monitoring parameter $T_{EG,m}$ is measured, recorded and reported on the basis of the following sub-parameters: - $T_{EG,m,flare-2}$: Temperature in the exhaust gas of Flare 2 - $T_{EG,m,flare-3}$: Temperature in the exhaust gas of Flare 3

Monitoring equipment	*Specifications and calibration details for the installed/utilized thermocouples:* *Thermocouple used during the considered monitoring period for measuring $T_{EG,m,flare-2}$ (Flare 2):* - Manufacturer: Ecil Produtos e Sistemas de Medição e Controle Ltda. - Model: N - Accuracy: ±2.0ºC - Serial Number: 15203/128885. - Calibration requirements: frequency (as specified by the monitoring methodology/tool): periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): yearly - Calibration Date(s): - Calibration event dated 24/05/2019 (Calibration Certificate 5547, issued by Works Serviços) valid until 23/05/2020 (1 year); - Calibration event dated 11/05/2020 (Calibration Certificate 6288, issued by Works Serviços) valid until 10/05/2021 (1 year); *Thermocouple used during the considered monitoring period for measuring $T_{EG,m,flare-3}$ (Flare 3):* - Manufacturer: Ecil Produtos e Sistemas de Medição e Controle Ltda. - Model: N - Accuracy: ±2.0ºC - Serial Number: 95719/1/2. - Calibration requirements: frequency (as specified by the monitoring methodology/tool): periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): yearly - Calibration Date(s): - Calibration event dated 15/06/2019 (Calibration Certificate 5546, issued by Works Serviços) valid until 14/06/2020 (1 year); - Calibration event dated 11/05/2020 (Calibration Certificate 6287, issued by Works Serviços) valid until 10/05/2021 (1 year);
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	-
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of baseline emissions

Additional comments	Measurements outside the operational temperature specified/recommended by the manufacturer may indicate that the flare is not functioning correctly and may require maintenance. Unexpected changes such as a sudden increase/drop in temperature can occur for different reasons. As part of the monitoring procedure, these events are noted in the site records along with any corrective action that was implemented to correct the issue. Measurements are required to determine if manufacturer's flare specifications for operating temperature are met.

Data/Parameter	**$Flame_m$**
Unit	Flame status "*on*" or flame status "*off*"
Description	Flame detection of flare in the minute *m*
Measured/calculated/ Default	Measured
Source of data	Continuously measurements are performed by Ultra violet (UV) flame detectors (one UV flame detector for each installed high temperature enclosed flare with recordable electronic signal) . For each one of the flares, whenever flame is detected in the flare, flame status "*on*" or "*1*" value is attributed. Whenever no flame is detected in the flare, flame status "*off*" or "*0*" is attributed.
Value(s) of monitored parameter	Values for each one of the installed 2 high temperature enclosed flares are reported in the monthly emission reduction calculation spreadsheets (that is enclosed to this Monitoring Report). Measurement data is recorded and reported with an every-minute frequency. While measurements are performed by 2 UV flame detectors (one UV flame detector installed in each individual installed flare), the monitoring parameter $Flame_m$ is thus measured, recorded and reported on the basis of the following sub-parameters: - $Flame_{m,flare\text{-}2}$: Flame detection in Flare 2 - $Flame_{m,flare\text{-}3}$: Flame detection in Flare 3
Monitoring equipment	*Specifications and calibration details for the installed/utilized UV Flame detectors:* *UV Flame detector for measuring* $Flame_{m,flare\text{-}2}$ *(Flare 2)*: - Manufacturer: SELCON Sistemas Eletrônicos de Controle Ltda. - Model: SEL-SV-UL-K4 - Serial Number: 356741456 - Calibration frequency: No calibration is required as the equipment has a self-checking function. *UV Flame detector for measuring* $Flame_{m,flare\text{-}3}$ *(Flare 3):* - Manufacturer: SELCON Sistemas Eletrônicos de Controle Ltda. - Model: SEL-SV-UL-K4 - Serial Number: 357890145 - Calibration frequency: No calibration is required as the equipment has a self-checking function.
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.

Calculation method (if applicable)	Not applicable
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**Maintenance$_y$**
Unit	Calendar dates
Description	Maintenance events completed in year *y* as monitored by the project participants.
Measured/calculated/ Default	-
Source of data	Maintenance logs
Value(s) of monitored parameter	The following relevant maintenance events (inspection and maintenance services) are applicable for the flares during the considered monitoring period: - 10/06/2019 and 08/07/2020: General inspection/maintenance service on Flare 2 (incl. inspection of the condition of the flares isolation ceramics revetment material, checking of conditions of the LPG supply valve for pilot flames, checking of condition/function of the air inlet dumpers, checking of the conditions of the thermocouples, checking of the condition of the UV flame detectors, checking of the condition of the flame arrester valves, checking of the conditions of the LFG injectors, checking of painting conditions). - 11/06/2019 and 09/07/2020: General inspection/maintenance service on Flare 3 (incl. inspection of the condition of the flares isolation ceramics revetment material, checking of conditions of the LPG supply valve for pilot flames, checking of condition/function of the air inlet dumpers, checking of the conditions of the thermocouples, checking of the condition of the UV flame detectors, checking of the condition of the flame arrester valves, checking of the conditions of the LFG injectors, checking of painting conditions). As per the applied maintenance practice for the project activity, general inspection/maintenance services on the flares are opportunely performed during planned or unplanned interruptions of operation of the flares within a time interval between 2 performed inspection/maintenance services events never higher than 1 year. After the project's commissioning, the isolation ceramics revetment material of the 2 installed high temperature enclosed flares were replaced in July/2008. Performed maintenance and overhauling services in the flare are performed under by specialized technical service team under conformance with maintenance requirements for the flares (as established by equipment manufacturer) and as required by the ex-ante determined parameter $SPEC_{flare}$. Further details about the parameter $SPEC_{flare}$ are included in Section D.1.
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	Not applicable.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	The maintenance event logs and documentation for the whole project activity are recorded as per requirement of the company's ISO 9001 and ISO 14001 certified quality and control (QA/QC) and environmental management (EMS) system that is implemented for activities undertaken at the AMC landfill.

Purpose of data/parameter	Calculation of baseline emissions
Additional comments	These dates are required so that they can be compared to the maintenance schedule to check that maintenance events were completed within the minimum time between maintenance events specified by the manufacturer ($SPEC_{flare}$).

Data/Parameter	**$FC_{LPG,y}$**
Unit	ton
Description	Quantity of LPG consumed by the project activity in year *y*
Measured/calculated/ Default	Measured
Source of data	Monitored values of $FC_{LPG,y}$ are based on measurements performed by the local LPG distribution company as part of LPG delivery events and through the use of weight scales.
Value(s) of monitored parameter	0 (No LPG was consumed during the considered monitoring period)
Monitoring equipment	Since the consume of LPG was 0 during the considered monitoring period, there is no weight scales used from the LPG distribution company for measuring this parameter.
Measuring/reading/recording frequency	Not applicable.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	The amount of consumed LPG is cross-checked with internal records of cost expenditures for fuel LPG as per the internal financial/accounting management system of BATTRE. Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of project emissions (due to consumption of LPG by the project activity).
Additional comments	-

Data/Parameter	**$NCV_{LPG,y}$**
Unit	GJ/ton LPG
Description	Net calorific value of the fuel LPG
Measured/calculated/ Default	Default value is selected.
Source of data	National default value as per the Brazilian National Energetic Balance Report for year 2020 (Balanço Energético Nacional (BEN) – 2020) / Table VIII.9 – Specific Mass and Heating Values (Higher Heating Value). This official document was published by the public entity Empresas de Pesquisas Energéticas (EPE). While create and established in accordance with the Federal Law 10.847 of 15/03/2004, the EPE is a governmental entity that undertakes energy planning related investigation and research services. The BEN-2020 report is available online: https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/balanco-energetico-nacional-2020 Reported value in kcal/kg is converted into GJ/ton.
Value(s) of monitored parameter	49.2
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	In accordance with the PDD, as national default value is considered, every year monitoring frequency is thus applied.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at BATTRE in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of project emissions (due to consumption of LPG by the project activity).
Additional comments	-

Data/Parameter	**$EF_{CO2,LPG,y}$**
Unit	tCO_2/GJ LPG
Description	CO_2 emission factor of fuel LPG in year *y*
Measured/calculated/ Default	Default value is selected.
Source of data	Value is selected as per 2006 IPCC Guidelines on National GHG Inventories (applicable value at upper limit of uncertainty at 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy)).

Value(s) of monitored parameter	0.0656
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	In accordance with the PDD, as IPCC default value is considered, an every year monitoring frequency is thus applied.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of project emissions (due to consumption of LPG by the project activity)
Additional comments	-

Data/Parameter	**$EG_{Diesel\text{-}Generator,y} = EC_{PJ,captive,y}$**
Unit	MWh
Description	Quantity of electricity generated by captive diesel backup generator during the year *y* = Quantity of electricity consumed from captive diesel backup generator during the year *y*
Measured/calculated/ Default	Measured
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instrument (one electricity meter with recordable electronic signal).
Value(s) of monitored parameter	

Month	Amount of consumed electricity generated by captive diesel backup generator (MWh)
May./2018 (from 27/05 to 31/05/2018)	0
Jun./2018	0
Jul./2018	0
Aug./2018	0
Sep./2018	17.883
Oct./2018	12.308
Nov./2018	57
Dec./2018	0

Monitoring equipment	- Manufacturer: KRON Instrumentos Elétricos Ltda. - Model: MULTIMEDIDOR MKM-D - Accuracy: ±0.2% - Serial Number (S/N): 1969007 - Required calibration frequency (as specified by the monitoring methodology/ methodological tool): As per the PDD, all monitoring equipment must be calibrated periodically. The "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" establishes the following regarding maintenance and calibration for electricity meters: "*Monitoring equipment/instrument(s) will be subject to a regular maintenance and testing regime in accordance to appropriate national / international standards/requirements and/or best practice.*" - Calibration frequency (as per the recommendation of the meter manufacturer): it is important to note that the installed meter is approved/certified by INMETRO (The Brazilian national authority for metrology and standardization issues), and it is thus in conformance with INMETRO's requirements for maintenance and testing of electricity meters. According to the instrument's manufacturer, the meter is to be calibrated every 5 years. A calibration frequency of 5 years is thus adopted. - Dates and validity of performed calibration events valid for the considered monitoring period: - Calibration event dated 10/01/2018 valid until 09/01/2023, as indicated in the Calibration Certificate Number 4965, issued by Works Serviços Ltda.
Measuring/reading/recording frequency	Continuous measurements performed by installed electricity meters are recorded/reported every hour.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of the project emissions.
Additional comments	-

Data/Parameter	**$FC_{Diesel,y}$**
Unit	Liters
Description	Quantity of fuel diesel combusted by the captive off-grid electricity generator
Measured/calculated/ Default	Measured.
Source of data	Measured as part of the operation of the project activity by applying appropriate fuel meter.

<table>
<tr><td>Value(s) of monitored parameter</td><td>
<table>
<tr><th>Month</th><th>Amount of consumed diesel by the captive off-grid electricity generator (L)</th></tr>
<tr><td>May./2018 (from 27/05 to 31/05/2018)</td><td>0</td></tr>
<tr><td>Jun./2018</td><td>0</td></tr>
<tr><td>Jul./2018</td><td>0</td></tr>
<tr><td>Aug./2018</td><td>0</td></tr>
<tr><td>Sep./2018</td><td>0</td></tr>
<tr><td>Oct./2018</td><td>0</td></tr>
<tr><td>Nov./2018</td><td>0</td></tr>
<tr><td>Dec./2018</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment</td><td><u>Specifications and calibration details for the fuel meter used for measuring quantity of fuel diesel combusted by the captive off-grid electricity generator:</u>

- Manufacturer: Macnaught Pty Ltd.
- Model: DM100
- Serial number (S/N): n/a
- Accuracy: ±1%
- Required calibration frequency: As per the PDD, periodic calibration events are to be performed in a frequency as per instrument specifications and/or instrument manufacturer’s recommendations.
Also as per the PDD, the instrument is to be subject to a regular maintenance and testing regime in accordance to appropriate national /international standards/requirements and/or best practice. For the particular case of the installed fuel meter (positioned in the fuel supply hose of a backup captive off-grid electricity generator (fuelled by diesel), there are no applicable national/international standards/requirements to be applied. By taking into account the design[11] and construction of the fuel meter (i.e. the fuel meter is tested as part of its manufacturing and delivery processes) and by also taking into account the not frequent use of the backup captive off-grid electricity generator (in which the fuel meter is installed) as part of the operation of the project activity, and also taking into account good practices for calibration of this type of instrument, it is defined that testing/calibration events are to be performed in the instrument with at least an every 3 years frequency.
- Dates for performed testing/calibration events valid for the considered monitoring period: while the instrument was installed on 17/03/2016, no calibration event was performed until 31/12/2017 (end of the considered monitoring period). Since the period between the installation date of the instrument and the end of the considered monitoring period encompasses 655 days, which is shorter than a 3-year period (i.e. 365 days * 3 = 1,095 days), the instrument is thus regarded as operated under full conformance with its applicable calibration requirements during the considered monitoring period.</td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Accumulated measurements records of consumption of diesel by the backup captive off-grid electricity generator (fuelled by diesel) are reported at with at least once a week, with values being aggregated on a monthly basis.</td></tr>
</table>

[11] The following is established in the instruction manual for the installed fuel meter model DM100:

> *“The Macnaught DM100 fuel meter has incorporated the oval rotor principal into its design. This has proven to be a highly reliable and highly accurate method of measuring flow, providing exceptional repeatability and high accuracy.”*

The instruction manual and the specification sheet for the fuel meter model DM100, manufactured by Macnaught Pty Ltd. Are available online:
http://www.redashe.com/sites/default/files/Data_Sheets/Instruction-Manuals/Macnaught/Macnaught-DM100-Instruction-Manual.pdf
https://www.omniprocess.se/fileadmin/user_upload/omniprocess/pdf/datasheets/dm100.pdf

Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of project emissions
Additional comments	It is relevant to note that in the context of the determination of emission reductions achieved by the project activity during the considered monitoring period, monitoring records for the parameter $FC_{Diesel,y}$ are considered uniquely for the determination of the value for CO_2 emission factor for electricity consumed by the project activity through the application of guidance valid for Scenario C.III, Option B1 of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0). Project emissions due to consumption by the project activity of electricity generated by the installed backup captive off-grid electricity generator (fuelled by diesel) are primarily determined based on measurement records of the amount of electricity consumed by the project activity and generated by such backup electricity generator (monitoring parameter $EG_{Diesel\text{-}Generator,y} = EC_{PJ,captive,y}$). Therefore, monitoring records for the parameter $FC_{Diesel,y}$ are therefore not directly used for the determination of project emissions associated to consumption of fossil fuel diesel for generation of electricity that is consumed by the project activity.

Data/Parameter	**$NCV_{Diesel,y}$**
Unit	GJ/liters
Description	Net calorific value of the fuel diesel in year *y*
Measured/calculated/ Default	Default
Source of data	IPCC default values (at upper limit of uncertainty at 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories is selected.
Value(s) of monitored parameter	43.3
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	In accordance with the PDD, as IPCC default value is considered, every year monitoring frequency is thus assumed as being applied.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).

Purpose of data/parameter	Calculation of project emissions
Additional comments	It is relevant to note that in the context of the determination of emission reductions achieved by the project activity during the considered monitoring period, monitoring records for the parameter $NCV_{Diesel,y}$ are considered uniquely for the determination of the value for CO_2 emission factor for electricity consumed by the project activity through the application of guidance valid for Scenario C.III, Option B1 of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0). Project emissions due to consumption by the project activity of electricity generated by the installed backup captive off-grid electricity generator (fuelled by diesel) are primarily determined on the application of both default and conservative value for emission factor for electricity generated by such backup captive power generation source + measurement records of the amount of electricity consumed by the project activity and generated by such backup electricity generator (monitoring parameter $EG_{Diesel\text{-}Generator,y} = EC_{PJ,captive,y}$). Therefore, the selected value for the parameter $NCV_{Diesel,y}$ is not used for the determination of project emissions associated to consumption of fossil fuel diesel for generation of electricity that is consumed by the project activity.

Data/Parameter	**$EF_{CO2,Diesel,y}$**
Unit	tCO_2/GJ
Description	CO_2 emission factor of fuel diesel in year y
Measured/calculated/ Default	Default
Source of data	IPCC default values (at upper limit of uncertainty at 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories is selected.
Value(s) of monitored parameter	74,800
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	In accordance with the PDD, as IPCC default value is considered, an every year monitoring frequency is thus assumed as being applied.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of project emissions

Additional comments	It is relevant to note that in the context of the determination of emission reductions achieved by the project activity during the considered monitoring period, monitoring records for the parameter $EF_{CO2,Diesel,y}$ are considered uniquely for the determination of the value for CO_2 emission factor for electricity consumed by the project activity through the application of guidance valid for Scenario C.III, Option B1 of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0). Project emissions due to consumption by the project activity of electricity generated by the installed backup captive off-grid electricity generator (fuelled by diesel) are primarily determined on the application of both default and conservative value for emission factor for electricity generated by such backup captive power generation source + measurement records of the amount of electricity consumed by the project activity and generated by such backup electricity generator (monitoring parameter $EG_{Diesel\text{-}Generator,y} = EC_{PJ,captive,y}$). Therefore, the selected value for the parameter $EF_{CO2,Diesel,y}$ is therefore not used for the determination of project emissions associated to consumption of fossil fuel diesel for generation of electricity that is consumed by the project activity.

Data/Parameter	$\rho_{reg,y}$
Unit	-
Description	Fraction of LFG that is required to be flared due to a requirement in year y
Measured/calculated/ Default	Calculated

Source of data	*Previously defined applicable/valid value for $\rho_{reg,y}$:* As indicated in the PDD, the quantity of methane assumed as contractually required to be destroyed at the AMC landfill was an issue in year 1999 in the context of the previously established public service concession contract for MSW management for the city of Salvador (incl. operation and management of the AMC landfill) that was delegated to the company Bahia Transferencia e Tratamento de Residuos S.A.). Upon request from Bahia Transferencia e Tratamento de Residuos S.A., a quantitative definition for the level/share of generated methane required to be destroyed at the AMC landfill was formally confirmed by the Administration of the Municipality of Salvador (municipal authority) by the end of year 2010 through the issuance of an official document titled "*Clarification about Bahia Transferencia e Tratamento de Residuos S.A.'s contractual agreement with respect to definitions of yearly quantity of methane that Bahia Transferencia e Tratamento de Residuos S.A. shall destroy in the absence of the CDM project activity currently under operation in the landfill site Aterro Metropolitano Central (baseline scenario)*[12]*"* (document dated 20/08/2010). Copy of this document (including its official translation into English Language) is enclosed in Appendix 3 of the PDD. As outlined in the PDD, the approach applied in year 2010 by the Administration of the Municipality of Salvador for actually defining the values presented in the official declaration document is based on the outcome and conclusions from an independent evaluation technical paper published by the environmental authority of São Paulo State in Brazil that is titled "*Reducing the uncertainty of methane recovered (R) in greenhouse gas inventories from waste sector and of adjustment factor (AF) in landfill gas projects under the Clean Development Mechanism*"). This technical paper refers to the potential theoretical share of generated methane that are/could be collected by well-designed conventional LFG venting/combustion drains (without use of forced LFG extraction through negative pressure) in several landfills existing in Brazil (incl. the AMC landfill) at the time related assessments were performed. Currently, the paper is still webhosted at the website of CETESB (the environmental authority for São Paulo State in Brazil[13]). In summary, the existence and validity of the contractual requirement that defines the current minimum level/share of methane required to be destroyed at the AMC landfill as 5% (as previously defined by the Administration of the Municipality of Salvador) is evidenced on the following documents: (i) a pre-project implementation contractual document (named "*Bahia Transferencia e Tratamento de Residuos S.A.'s original technical proposal*"[14]) that sets/defines the general terms and conditions/rules for the operations of the AMC landfill as part of the public service concession agreement established between BATTRE and the Administration of the Municipality of Salvador (concession agreement encompassesing MSW management related activities in the city of Salvador (e.g. street cleaning, cleaning of public parks and squares, collection and disposal of MSW, etc.)). (ii) The above-referred complementary clarification document titled "*Clarification about Bahia Transferencia e Tratamento de Residuos S.A.'s contractual agreement with respect to definitions of yearly quantity of methane that Bahia Transferencia e Tratamento de Residuos S.A. shall destroy in the absence of the CDM project activity currently under operation in the landfill site Aterro Metropolitano Central (baseline scenario"* (issued by the Administration of the Municipality of Salvador (municipal authority) in 20/08/2010) that confirms the current minimum volume/share of methane to be destroyed at the AMC landfill (in the absence of the project activity (baseline scenario)). While the document

[12] Translation of the original title (in Brazilian Portuguese language) into English language.

[13] The paper “Reducing the uncertainty of methane recovered (R) in greenhouse gas inventories from waste sector and of adjustment factor (AF) in landfill gas projects under the Clean Development Mechanism” is available online: http://www.cetesb.sp.gov.br/userfiles/file/mudancasclimaticas/biogas/file/docs/artigos_dissertacoes/magalhaes_alves_santofilho_costa_kelson.pdf

[14] Translation of the original title (in Brazilian Portuguese language) into English language.

	quantitatively refers to absolute volume of methane (in normal m^3 (Nm^3)) that are valid for years 2005, 2006, 2007, 2008, 2009 and 2010, it is crucial to note that such values represent 5% of the accumulated ex-post measured values for amount methane that was collected and destroyed as a result of the operation of the implemented CDM project activity during each one of these particular years and were indeed defined as such. While the official declaration document is valid for the whole remaining lifetime of the AMC landfill, for the whole time period encompassing the 3rd 7-year crediting period for the project activity, the minimum level/share of methane defined as required to be destroyed at the AMC landfill (in the absence of the project activity (baseline scenario)) thus represent 5% of the amount of methane actually collected and destroyed by the project activity by its methane destruction devices (equal to $F_{CH4,PJ,capt,y}$ (sum of the amount of methane that is sent to the internal combustion gas engines and to the flares in year *y* (however by not taking into account values for flare efficiency))). (iii) The provision included in Appendix 3 of the latest version of the registered PDD for the currently expired 1st and 2nd 7-year crediting period (version 16.0 dated 22/01/2020, approved on 30/04/2020) where the baseline is defined as being "(…) *5% of all collected LFG by the project activity* (…)". *Confirmation of the validity of the previously defined applicable/valid value for $\rho_{reg,y}$ along the considered monitoring period:* As part of the monitoring procedures applicable for the project activity, the validity of the contractual requirement previously established by the Administration of the Municipality of Salvador (municipal authority responsible for the public service of solid waste management for the city of Salvador) is annually confirmed on an ex-post basis. This is under conformance with applicable monitoring requirement of ACM0001 (version 19.0). As outlined in a legal/regulatory opinion statement issued by chartered independent 3rd party legal consultant/advisor on 15/02/2018, no modification in the previously defined value for the fraction of LFG contractually required to be flared in the AMC landfill occurred. This confirmation included in the legal/regulatory opinion statement is *inter alia* based on performed systematic review and checking of the legal and regulatory framework applicable and valid for both the AMC landfill and MSW disposal sites in general (in a municipal, regional and national level) at the time of the issuance of such regulatory/legal opinion statement. The legal/regulatory opinion statement issued by chartered independent 3rd party legal consultant/advisor Mr. José Carlos W. Fagundes on 15/02/2018 represents an update of the previously issued legal/regulatory opinion statements dated 17/02/2017 and 26/02/2016 which were also issued by the same chartered independent 3rd-party legal consultant/advisor. Such previously issued legal/regulatory opinion statement confirms no occurrence of any change in the previously defined level/share of methane contractually required to be destroyed (through combustion) at the AMC landfill.
Value(s) of monitored parameter	5%

Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	The validity of the previously defined applicable/valid value for the level/share of methane contractually required to be destroyed (through combustion) at the AMC landfill is annually confirmed/verified.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**$TDL_{grid,y}$**
Unit	-
Description	Average technical transmission and distribution losses for grid sourced electricity consumed by the project activity
Measured/calculated/ Default	Default
Source of data	Applicable default value for consumption of grid-sourced electricity as per Option C.III of the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) is selected.
Value(s) of monitored parameter	20%
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	In accordance with the PDD, default value as per Option C.III of the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) is considered, an every year monitoring frequency is thus assumed as being applied.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of project emissions
Additional comments	-

Data/Parameter	$TDL_{captive,y}$
Unit	-
Description	Average technical transmission and distribution losses for electricity sourced by the captive electricity generator
Measured/calculated/ Default	Default
Source of data	Applicable default value as per Option C.III of the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) is selected.
Value(s) of monitored parameter	20%
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	In accordance with the PDD, default value as per Option C.III of the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) is considered, an every year monitoring frequency is thus assumed as being applied.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of project emissions
Additional comments	-

Data/Parameter	**Status of biogas destruction device**
Unit	-
Description	Operational status of biogas destruction devices
Measured/calculated/ default	Continuously measured.
Source of data	Records confirming the operational status for the installed high temperature enclosed flares are considered by continuous monitoring of the signal of the UV flame detectors installed in each one of the flares were during the considered monitoring period with related monitoring details are included under details for the monitoring parameter "Flame detection of flare in the minute *m*" ($Flame_m$). The electronic control system for each internal combustion gas engine continuously monitor and reports via electronic signal the operational status of the engine-generator set (engine under operation ("*on*") or engine not under operation ("*off*")).

	It is relevant to note that, for the particular case of the set of 19 internal combustion gas engines, the parameter "Status of biogas destruction device" is monitored on the same basis as the monitoring parameter "Operation of the equipment that consumes LFG" ($Op_{j,h}$) (for each individual internal combustion gas engine through the sub-parameters $Op_{engine-1,h}$, $Op_{engine-2,h}$, $Op_{engine-3,h}$, (…), $Op_{engine-19,h}$) as reported in the monthly emission reductions calculation spreadsheets. It is relevant to note that, for the particular case of the set of installed high temperature enclosed flares, the parameter "Status of biogas destruction device" is monitored on the same basis as the monitoring parameter "Flame detection of flare in the minute m" ($Flame_m$) (for each individual flare through the sub-parameters $Flame_{m,flare-2}$ and $Flame_{m,flare-3}$) as reported in the monthly emission reductions calculation spreadsheets.
Value(s) of monitored parameter	Not applicable.
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	Values are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and/or maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed in accordance with detailed working instructions that are included in the company's ISO 9001 and 14001 certified quality management and control (QA/QC) and environmental management system (EMS).
Purpose of data/parameter	Calculation of baseline emissions.
Additional comments	-

The following monitoring parameters (which are also included in the monitoring plan of the PDD) were not monitored as the methodological options for which they are applicable/valid were not selected as the monitoring or calculation approaches for the determination of baseline emissions achieved by the project activity during the considered monitoring period:

- Volumetric flow of LFG stream in time interval *t* on a dry basis ($V_{t,db}$)
- Volumetric fraction of CH_4 in the collected LFG in time interval *t* on a dry basis ($V_{CH4,t,db}$)
- Mass flow of the LFG stream in time interval *t* on dry basis ($M_{t,db}$)
- Saturation pressure of H_2O at temperature T_t in time interval t ($P_{H2O,t,Sat}$)
- Mass flow of methane in the exhaust gas of the flare on a dry basis at reference conditions in the time period *t* ($F_{CH4,EG,t}$)
-

D.3. Implementation of sampling plan

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Not applicable.

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

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Under conformance with provisions and calculation approaches of the PDD, baseline emissions (BE_y) for the project activity under its current design configuration are determined (in tCO_2e) for the considered monitoring period as follows:

$$BE_y = BE_{CH4,y}$$

Where:

$BE_{CH4,y}$ Baseline emissions of methane from the SWDS (in tCO_2e)[15]. As established by ACM0001 (version 19.0), the determination of $BE_{CH4,y}$ is based on the amount of methane that is actually captured and combusted (destroyed) by the project activity in its methane destruction devices and by also taking into account the amount of methane that, in the absence of the project activity (baseline scenario), would be otherwise captured and destroyed in the landfill by the pre-project conventional LFG destruction system (conventional passive flares).

In addition, the effect of methane oxidation (that, as per ACM0001 (version 19.0), is assumed as existing in the baseline scenario and not in the project scenario) is also taken into account. $BE_{CH4,y}$ is thus determined as follows:

$$BE_{CH4,y} = ((1 - OX_{top\_layer}) * F_{CH4,PJ,y} - F_{CH4,BL,y}) * GWP_{CH4}$$

Where:

OX_{top_layer} Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline scenario. OX_{top_layer} is ex-ante determined as 10%. Further details about the selection of the value for OX_{top_layer} is included in Section D.1 and in the PDD.

$GWP_{CH4,y}$ Global warming potential of CH_4. GWP_{CH4} is ex-ante determined as 25. Further details about the selection of the value for GWP_{CH4} is included in Section D.1 and in the PDD.

$F_{CH4,BL,y}$ Amount of methane in the LFG that would be flared in the baseline scenario (absence of project activity) (in tCH_4). As outlined in Section B.6.1 of the PDD, $F_{CH4,BL,y}$ is calculated as follows:

$$F_{CH4,BL,y} = 0.05 * F_{CH4,PJ,capt,y}$$

Where:

$F_{CH4,PJ,capt,y}$ Amount of methane collected by the project activity (in tCH_4). In the particular case of the determination of $F_{CH4,BL,y}$, the calculation parameter $F_{CH4,PJ,capt,y}$ is determined as the sum of the amount of methane that is sent to the project's methane destruction devices (i.e. amount of CH_4 sent to the set of 19 internal combustion

[15] SWDS = Solid Waste Disposal Site. For the case of the project activity, the SWDS is the UVS-Caieiras landfill.

gas engines and to the set of 2 high temperature enclosed flares) as follows:

$F_{CH4,PJ,capt,y} = F_{CH4,sent,flare,y} + F_{CH4,EL,y}$

Where:

$F_{CH4,EL,y}$ Amount of methane which is destroyed through combustion of collected LFG in the internal combustion gas engines (in tCH_4).
Details for the determination of every-minute values for $F_{CH4,EL,y}$ are presented below (under "*Determination of every-minute values for the calculation parameters $F_{CH4,sent\_flare,y}$ and $F_{CH4,EL,y}$*").
It is relevant to note that for the particular context of determination of $F_{CH4,BL,y}$, the working hours and/or other status/conditions of which each device and status of the internal combustion gas engines are not accounted, thus potentially maximizing the determined value for $F_{CH4,BL,y}$ as a conservative approach.

$F_{CH4,sent,flare,y}$ Amount of methane in the LFG which is sent to the flares (in tCH_4). Details for the determination of every-minute values for $F_{CH4,sent\_flare,y}$ are presented below (under "*Determination of every-minute values for the calculation parameters $F_{CH4,sent\_flare,y}$ and $F_{CH4,EL,y}$*").

For the considered monitoring period, the accumulated value for $F_{CH4,BL,y}$ is calculated as 807 tCH_4.

$F_{CH4,PJ,y}$ Amount of methane which is destroyed by the project activity through combustion of collected LFG in project's methane destruction devices (in tCH_4). $F_{CH4,PJ,y}$ is determined as follows:

$F_{CH4,PJ,y} = F_{CH4,flared,y} + F_{CH4,EL,y}$

Where:

$F_{CH4,EL,y}$ Amount of methane which is destroyed through combustion of collected LFG in the internal combustion gas engines (in tCH_4). Details for the determination of every-minute values for $F_{CH4,EL,y}$ for each individual internal combustion gas engine during the are presented below (under "*Determination of every-minute values for the calculation parameters $F_{CH4,sent\_flare,y}$ and $F_{CH4,EL,y}$*").

$F_{CH4,flared,y}$ Amount of methane which is destroyed through combustion of collected LFG in the flares (in tCH_4). In accordance with calculation guidance included in the PDD and by following applicable guidance of the methodological tool "Tool to

determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0), for each individual flare every-minute values for $F_{CH4,flared,y}$ are determined as the difference between the amount of methane supplied to the flare and residual methane emissions from combustion of LFG in the flare, as follows:

$$F_{CH4,flared,y} = F_{CH4,sent\_flare,y} - (PE_{flare,y} / GWP_{CH4})$$

Where:

$F_{CH4,sent\_flare,y}$	Amount of methane in the LFG which is sent to the flares. Details for the determination of every-minute values for $F_{CH4,sent\_flare,y}$ for each individual flare are presented below (under "*Determination of every-minute values for the calculation parameters $F_{CH4,sent\_flare,y}$ and $F_{CH4,EL,y}$*").
$PE_{flare,y}$	Project emissions from flaring of the residual gas stream. Details for the determination of every-minute values for $PE_{flare,y}$ for each individual flare are presented below (under "*Determination of $PE_{flare,y}$*").
GWP_{CH4}	Global warming potential of CH_4. GWP_{CH4} is ex-ante determined as 25. Further details about the selection of the value for GWP_{CH4} is included in Section D.1 and in the PDD.

Determination of $F_{CH4,sent\_flare,y}$ (calculation of sub-parameters $F_{CH4,sent\_flare,flare-2}$ and $F_{CH4,sent\_flare,flare-3}$):

By following calculation Option C of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0)[16], the mass flow of greenhouse gas *i* ($F_{i,t}$) (*i* = CH_4) for each installed flare is determined as follows:

$$F_{CH4,sent\_flare,y,flare-n} = V_{t,n,wb,flare-n} * v_{CH4,t,wb} * \rho_{CH4,n}$$

Where:

[16] For the considered monitoring period, Option C of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0) (where the gaseous stream the tool shall be applied to is the stream of collected LFG that is sent to the flares and to the electricity generation facility)[16] is the selected option for determination of values of $F_{CH4,sent\_flare,y}$ valid for each one of the installed 2 flares (calculation sub-parameters $F_{CH4,sent\_flare,y,flare-2}$ and $F_{CH4,sent\_flare,y,flare-3}$) and values of $F_{CH4,EL,y}$ valid for each one of the 21 internal combustion gas engines (based on the calculation of the sub-parameters $F_{CH4,EL,y,engine-1}$, $F_{CH4,EL,y,engine-2}$, (…) , $F_{CH4,EL,y,\ engine-19}$). This option represents one of the applicable calculation methods the PDD refers to. The PDD states the following regarding the calculation approach for values of $F_{CH4,sent\_flare,y}$ and $F_{CH4,EL,y}$:

> "*Applicable guidance of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" will be applied to determine $F_{CH4,sent\_flare,y}$ by using Option 2: Simplified calculation without measurement of the moisture content, and one of the options A, C or D. The selection of the determination option will depend on project conditions and equipment to be installed."*

Suffix "*Flare-n*": (flare in question: Flare 2 and Flare 3)

$V_{t,n,wb,flare-n}$ Volumetric flow of the gaseous stream (LFG) in time interval *t* on a wet basis at normal conditions. For the considered monitoring period, every-minute values of the calculation parameter $V_{t,wb,flare-n}$ valid for each flare (calculation sub-parameters $V_{t,wb,flare-2}$ and $V_{t,wb,flare-3}$) are directly measured and reported (in Nm^3 wet gas/h) in the monthly emission reduction calculation spreadsheets valid for the considered monitoring period (and enclosed to this Monitoring Report).

By taking into account that in the particular case of the project activity, during the considered monitoring period, measurements of volumetric flow of the gaseous stream (LFG) valid for each one of the 2 flares are already performed in Nm^3 wet gas per hour (by considering standard temperature and pressure (STP) conditions), the following assumption is valid:

$V_{t,n,wb,flare-n}$ is equivalent to $V_{t,wb,flare-n}$

Where:

$V_{t,wb,flare-n}$ Volumetric flow of the gaseous stream (LFG) in time interval *t* on a wet basis for flare *n* (n = 2 and 3), with monitoring details being presented in Section D.2

Note: in accordance with the PDD, since measurements of LFG flow to each one of the flares are automatically performed and recorded in normalized cubic meters (by considering standard temperature and pressure (STP) conditions), monitoring of "Pressure of the LFG stream in time interval t" (P_t) and "Temperature of the LFG stream in time interval *t*" (T_t) are not required to be considered for the determination of $V_{t,n,wb,flare-n}$.

$v_{CH4,t,wb}$ Volumetric fraction of CH_4 in the gaseous stream in time interval *t* on a wet basis. As per the applied monitoring procedure, every-minute values of the monitoring parameter $v_{CH4,t,wb}$ (in m^3 of CH_4 / m^3 of wet LFG) are reported in the monthly emission reduction calculation spreadsheet valid for the considered monitoring period (and enclosed to this Monitoring Report). Further monitoring details about the monitoring parameter $v_{CH4,t,wb}$ are included in Section D.2.

$\rho_{CH4,n}$ Density of CH_4 in the gaseous stream (LFG) at normal conditions. For the considered monitoring period, value of $\rho_{CH4,n}$ (in kg of CH_4 / m^3 of CH_4) is calculated and reported in the monthly emission reduction calculation spreadsheet valid for the considered monitoring period (and enclosed to this Monitoring Report) as follows:

$\rho_{CH4,n} = (P_n * MM_i) / (R_u * T_n)$

Where:

P_n Absolute pressure at normal conditions. P_n is ex-ante determined as 101,325 Pa. Further details about the ex-ante determined parameter P_n are included in Section D.1 and in the PDD.

T_n Temperature at normal conditions. T_n is ex-

ante determined as 273.15 Kelvin. Further details about the ex-ante determined parameter T_n are included in Section D.1 and in the PDD.

MM_i Molecular mass of greenhouse gas *i* (*i* = CH_4). MM_i (*i* = CH_4) is ex-ante determined as 16.04 kg/mol. Further details about the ex-ante determined parameter MM_i (*i* = CH_4) are presented in Section D.1 and in the PDD.

R_u Universal ideal gases constant. R_u is ex-ante determined as 8,314 Pa.m^3 /kmol.K. Further details about the ex-ante determined parameter R_u are presented in Section D.1 and in the PDD.

$\rho_{CH4,n}$ is calculated as 0.7156650 $kgCH_4$ / m^3CH_4 as reported in the monthly emission reduction calculation spreadsheet valid for the considered monitoring period.

While for each installed flare, the calculated every-minute values of $F_{i,t,flare-n}$ are equivalent to every-minute values for $F_{CH4,sent\_flare,y,flare-n}$, (where n = 2 and 3) the monthly emission reduction calculation spreadsheets valid for the considered monitoring period include the determination of every minute values of $F_{CH4,sent\_flare,y,flare-n}$ that is applicable for each one of the installed 2 high temperature enclosed flares for which collected LFG is sent for combustion.

Determination of $F_{CH4,EL,y}$ (calculation sub-parameters $F_{CH4,EL,y,engine-1}$, $F_{CH4,EL,y,engine-2}$, (…), $F_{CH4,EL,y,engine-19}$):

By also following calculation Option C of of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0), the mass flow of greenhouse gas *i* ($F_{i,t}$) (*i* = CH_4) to each individual internal combustion gas engine ($F_{CH4,EL,y,engine-1}$, $F_{CH4,EL,y,engine-2}$, (…), $F_{CH4,EL,y,engine-19}$) is determined as follows:

$$F_{CH4,EL,y,\ engine-n} = V_{t,wb,n,engine-n} * v_{CH4,t,wb,flare} * \rho_{CH4,n}$$

Where:

n Number of the installed internal combustion gas engines *n* (additional/alternative methane destruction devices for the project activity) = 1, 2, …, 19.

$V_{t,,wb,n,engine-n}$ Volumetric flow of the gaseous stream (LFG) to the internal combustion gas engine *n* in time interval *t* on a wet basis at normal conditions. For the considered monitoring period, every-minute values of $V_{t,wb,n.engine-n}$ (calculation sub-parameters $V_{t,wb,n,engine-1}$, $V_{t,wb,n,engine-2}$, (…), $V_{t,wb,n,engine-19}$) are reported (in Nm^3 wet gas/h) in the monthly emission reduction calculation spreadsheets valid for the considered monitoring period (and enclosed to the Monitoring Report).

While in the particular case of the project activity, during the considered monitoring period, measurements of volumetric flow of the gaseous stream (LFG) sent to each one of the 19 engines are not processed and recorded in Nm^3 of wet gas/h (normal conditions), values of values of $V_{t,wb,n,engine-n}$ (calculation sub-parameters $V_{t,wb,n,engine-1}$, $V_{t,wb,n,engine-2}$, (…), $V_{t,wb,n,engine-19}$) valid for each minute encompassed by the 220-day

monitoring period are thus calculated in a separated spreadsheet[17] (that is also enclosed to this Monitoring Report) as follows:

Under conformance with related provisions of the PDD, the following equation is applied to convert every-minute records of measurements of volumetric flow of LFG sent to each one of the 19 internal combustion gas engines from actual conditions to normalized (standard) conditions of temperature and pressure:

$V_{t,wb,n,engine-n} = V_{t,wb,engine-n} * (T_n / T_{t,engine-n}) * (P_{t,engine-n} * P_n)$

Where:

$V_{t,wb,engine-n}$	Volumetric flow of the gaseous stream (LFG) to the engine *n* in time interval *t* on a wet basis at actual conditions. Every-minute measurement records of $V_{t,wb,engine-n}$ for each engine *n* (where *n* = 1, 2, (…), 19) valid for the whole considered monitoring period are reported (in m³ wet gas/h) in a separated reduction calculation spreadsheet which is enclosed to the Monitoring Report. Measurement records are presented under sub-parameters $V_{t,wb,engine-1}$, $V_{t,wb,engine-2}$, $V_{t,wb,engine-3}$, (…), $V_{t,wb,engine-19}$). Further monitoring details for the sub-parameters $V_{t,wb,engine-n}$ (*n* = 1, 2, 3, (…), 19) are included under details for the monitoring parameter $V_{t,wb,j,}$ in Section D.2.
$T_{t,engine-n}$	Temperature of the gaseous stream in time interval *t*. Every-minute values of $T_{t,engine-n}$ for each engine *n* (where *n* = 1, 2, (…), 19) are reported (in Kelvin) in the monthly emission reduction calculation spreadsheets enclosed to the Monitoring Report. Further monitoring details about the sub-parameters $T_{t,engine-n}$ are included under details for the monitoring parameter T_t in Section D.2.
T_n	Temperature at normal conditions. T_n is ex-ante determined as 273.15 Kelvin. Further details about the ex-ante determined parameter T_n are included in Section D.1 and in the PDD.
$P_{t,engine-n}$	Pressure of the gaseous stream in time interval *t*. Every-minute values of $P_{t,engine-n}$ for each engine *n* are reported (in Pa) in the monthly emission reduction calculation spreadsheets enclosed to the Monitoring Report. Further monitoring details about the sub-parameters $P_{t,engine-n}$ are included under details for the monitoring parameter P_t in Section D.2.
P_n	Absolute pressure at normal conditions. P_n is ex-ante determined as 101,325 Pa. Further details about the ex-ante determined parameter P_n are included in Section D.1 and in the PDD.
n	Number of the installed internal combustion gas engines *n* (additional/alternative methane destruction devices for the project activity) = 1, 2, …, 19.

[17] In order to avoid having each one of the 8 MS-Excel monthly emission reduction spreadsheets with very high file size (i.e. exceeding 150 MB), the calculation of every-minute value of $V_{t,n,wb,engine-n}$ (under normalized (standard) conditions of temperature and pressure) valid for the whole considered monitoring period is made in a separated calculation spreadsheet. As part of the monitoring and emission reduction calculation procedure applied for the project activity, calculated values for $V_{t,n,wb,engine-n}$ (where n = 1, 2, (…), 19) (as reported in the separated calculation spreadsheet) are thus considered in the monthly emission reduction calculation spreadsheet.

All related calculation is presented in the monthly emission reduction calculation spreadsheets that are enclosed to the Monitoring Report.

$v_{CH4,t,wb}$ Volumetric fraction of CH_4 in the gaseous stream in time interval *t* on a wet basis. Further monitoring details about the monitoring parameter $v_{CH4,t,wb}$ are included above and in Section D.2.

$\rho_{CH4,n}$ Density of CH_4 in the gaseous stream (LFG) at normal conditions. $\rho_{CH4,n}$ is calculated as 0.7156650 $kgCH_4$ / m^3CH_4 as reported in the monthly emission reduction calculation spreadsheet valid for the considered monitoring period. Details about the determination of $\rho_{CH4,n}$ are presented above.

It is relevant to note that, as established in the PDD and presented in the monthly emission reduction calculation spreadsheets, for each one of the 19 internal combustion gas engine, the calculated amount of methane destroyed for minute *m* for a particular gas engine is directly accounted as 0 (zero) if the such methane destruction device is monitored as "not working" in such minute *m* (on the basis of available every-minute records for the parameter $Op_{j,h}$ (sub-parameters $Op_{engine-1,h}$, $Op_{engine-2,h}$, (…), $Op_{engine-19,h}$).

Determination of $PE_{flare,y}$:

$PE_{flare,y}$ is determined for each one of the installed flares ($PE_{flare,y,flare-2}$ and $PE_{flare,y,flare-3}$) by following the applicable stepwise guidance of the methodological tool "Project emissions from flaring" (version 03.0). For the considered monitoring period, every minute values for $PE_{flare,y,flare-2}$ and $PE_{flare,y,flare-3}$ are determined as a function of every-minute records of mass flow of methane actually sent to the flare in question (for each flare *n*, $F_{CH4,RG,m,flare-n} = F_{CH4,sent\_flare,y,flare-n}$, where *n* = 2 and 3) as well as based on calculated values for flare efficiency ($\eta_{flare,m}$) for each one of the flares as follows:

$$PE_{flare,y} = GWP_{CH4} * \sum_{m=1}^{525,600} F_{CH4,RG,m} * (1 - \eta_{flare,m}) * 10^{-3}$$

Where:

$\eta_{flare,m}$ Flare efficiency in minute m. Details for the determination of applicable values of $\eta_{flare,m}$ during the considered monitoring period are presented below under "*Determination of every-minute values of $\eta_{flare,m,flare-2}$ and $\eta_{flare,m,flare-3}$ (Flare 2 and Flare 3)".*

$F_{CH4,RG,m}$ Methane mass flow in the residual gas for the considered flare. For each minute *m* of the considered monitoring period and for each individual flare *n*, values for $F_{CH4,RG,m}$ are equal to every-minute reported measurement records of the calculation sub-parameter "Amount of methane in the LFG which is sent to the flares" ($F_{CH4,sent\_flare,y}$) that is valid for each individual flare (calculation sub-parameters $F_{CH4,sent\_flare,y,flare-2}$ and $F_{CH4,sent\_flare,y,flare-3}$)).

As per the applicable guidance of the methodological tool "Project emissions from flaring" and also as per the PDD, the methane mass flow in the residual gas (in a dry basis) for each minute *m* of the two time periods in year *y* during which the flare efficiency is measured shall be calculated by following the applicable guidance of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream". Values for the parameter $F_{CH4,RG,t}$ valid for each flare (calculation sub-parameters $F_{CH4,RG,t,flare-2}$ and $F_{CH4,RG,t,flare-3}$) are thus calculated as follows:

$F_{CH4,RG,t,flare-n} = V_{t,db,n,flare-n} * v_{CH4,t,db} * \rho_{CH4,n}$

Where:

$\rho_{CH4,n}$ Density of greenhouse gas *i* (*i* = CH_4) in the gaseous stream (LFG) at normal conditions. Further details for the determination of $\rho_{CH4,n}$ are presented above under the sub-section "*Determination of every-minute values for the calculation parameter $F_{CH4,sent\_flare,y}$*".

$v_{CH4,t,db}$ Volumetric fraction of greenhouse gas *i* (*i* = CH_4) in the gaseous stream in a time interval *t* on a dry basis. The following is stated in footnote 3 of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream":

> "*(…) Flow measurement on a dry basis is not feasible at reasonable costs for a wet gaseous stream, so there will be no difference in the readings for volumetric fraction in wet basis analyzers and dry basis analyzers (…).*"

Thus, every-minute values of $v_{CH4,t,db}$ are regarded as equal to every-minute values of the monitoring parameter $v_{CH4,t,wb}$ (for which further details are presented above under the sub-section "*Determination of every-minute values for the calculation parameter $F_{CH4,sent\_flare,y}$*").

$V_{t,db,n,flare-n}$ Volumetric flow of the gaseous stream (LFG) in time interval *t* on a dry basis for flare *n* (*n* = 2 and 3) at normal conditions. As per Option B of the applicable methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0), the volumetric flow of the gaseous stream on a dry basis for each flare at normal conditions (calculation sub-parameters $V_{t,db,n,flare-2}$ and $V_{t,db,n,flare-3}$) is determined by converting the measured volumetric flow from wet basis to dry basis as follows:

$V_{t,db,n,flare-n} = V_{t,wb,n,flare-n} / (1 + v_{H2O,t,db})$

Where:

$V_{t,wb,n,flare-n}$ Volumetric flow of the gaseous stream (LFG) in time interval *t* on a wet basis at normal conditions. Further details of $V_{t,wb,n,flare-n}$ are presented above under the sub-section "*Determination of every-minute values for the calculation parameter $F_{CH4,sent\_flare,y}$*"

$v_{H2O,t,db}$ Volumetric fraction of H_2O in the gaseous stream in time interval *t* on a dry basis. As per applicable guidance of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream", $v_{H2O,t,db}$ is calculated as follows:

$$v_{H2O,t,db} = \frac{m_{H2O,t,db} * MM_{t,db}}{MM_{H2O}}$$

Where:

MM_{H2O} Molecular mass of H_2O. MM_{H2O} is ex-ante determined as 18.0152 kg/kmol. Further details

about the ex-ante determined parameter MM_{H2O} are included in Section D.1 and in the PDD.

$MM_{t,db}$ Molecular mass of the gaseous stream in time interval *t* on a dry basis. As per applicable guidance of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream", $MM_{t,db}$ is calculated as follows:

$$MM_{t,db} = \sum_{k} (v_{k,t,db} * MM_{k})$$

Where:

k All gases, except H_2O, contained in the gaseous stream (e.g. N_2, CO_2, O_2, CO, H_2, CH_4, N_2O, NO, NO_2, SO_2, SF_6 and PFCs). See simplification below.

$V_{k,t,db}$ Volumetric fraction of gas *k* in the gaseous stream in time interval *t* on a dry basis. As per applicable guidance of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream":

> "*(…) The determination of the molecular mass of the gaseous stream ($MM_{t,db}$) requires measuring the volumetric fraction of all gases (k) in the gaseous stream. However, as a simplification, the volumetric fraction of only the gases k that are greenhouse gases and are considered in the emission reduction calculation in the underlying methodology must be monitored and the difference to 100% may be considered as pure nitrogen."*

ACM0001 (version 19.0) does not include any restriction to such simplification. Thus, only the volumetric fraction of gases that are greenhouse gases and are considered in related calculations (CH_4 in the particular case of the project activity) should be measured and the difference to 100% is just considered as pure nitrogen. Further details for the determination of the volumetric fraction of CH_4 in the gaseous stream ($V_{k,t,db}$ = $v_{CH4,t,db}$) are presented above under the calculation parameter $v_{CH4,t,db}$.

MM_k Molecular mass of gas *k* (*k* = CH_4 and N_2). The molecular mass of CH_4 and N_2 are ex-ante determined as 16.04 and 28.01, respectively. Further details about the ex-ante determined values for MM_k are included in Section D.1 and in the PDD.

$m_{H2O,t,db}$ Absolute humidity in the gaseous stream in time interval *t* n a dry basis. As per Option 2 of the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream", by conservatively assuming that the gaseous stream is saturated ($m_{H2O,t,db}$ = $m_{H2O,t,db,Sat}$), $m_{H2O,t,db}$ is calculated as follows [18]:

$$m_{H2O,t,db,Sat} = \frac{p_{H2O,t,Sat} * MM_{H2O}}{(P_t - p_{H2O,t,Sat}) * MM_{t,db}}$$

Where:

MM_{H2O} Molecular mass of H_2O. MM_{H2O} is ex-ante determined as 18.0152 kg/kmol. Further details about the ex-ante determined values for MM_{H2O} are included in Section D.1 and in the PDD.

P_t Absolute pressure of the gaseous stream in time interval *t*. Further monitoring details for P_t are included in Section D.2.

$MM_{t,db}$ Molecular mass of the gaseous stream in a time interval *t* on a dry basis. Further details for the determination of $MM_{t,db}$ are presented above.

[18] It is important to note that the simplified calculation for the absolute humidity of the gaseous stream ($m_{H2O,t,db}$) presented in Option 2 of the methodological "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" shall be applied by assuming the gaseous stream is dry or saturated depending on which is the conservative situation. Footnote 4 of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" states the following:

> "*An assumption that the gaseous stream is saturated is conservative for the situation that the mass flow of greenhouse gas I is underestimated (applicable for calculating baseline emissions). Conversely, an assumption that the gas stream is dry is conservative for the situation that the greenhouse gas t is overestimated (applicable for calculating project emissions).*"

In this particular case, $m_{H2O,t,db}$ is calculated for the determination of the mass flow of methane in the residual gas on a dry basis during the time period t ($F_{CH4,RG,t}$). While $F_{CH4,RG,t}$ is used for the determination of the parameter $PE_{flare,y}$ (project emissions from flaring the residual gas), the assumption that the gaseous stream is dry (conservatively applicable for calculating project emissions) would not be conservative in this case as an overestimation of the amount of methane in the residual gas would actually increase the calculated efficiency of the flares, thus resulting in a reduction of $PE_{flare,y}$ and consequent increment of emission reductions.

$p_{H2O,t,Sat}$ Saturation pressure of H_2O at temperature T in time *t*, Further monitoring details about the monitoring parameter $p_{H2O,t,Sat}$ are included in Section D.2.

Determination of every-minute values of $\eta_{flare,m,flare-2}$ and $\eta_{flare,m,flare-3}$ (Flare 2 and Flare 3):

Flare 2 and Flare 3:

For the particular case of Flare 3, the reference default value of $\eta_{flare,m}$ is directly considered as per Option A (Default value) of the methodological tool "Project emissions from flaring" from which the following related guidance of the PDD is applied:

"(…)
Option A: Default value
For each one of the high temperature enclosed flares installed as part of the project activity, the flare efficiency for each minute m ($\eta_{flare,m}$) is 90% when the following two operational conditions/requirements are simultaneously met (in order to demonstrate that the flare is operating as per the recommendations and requirements set by the equipment manufacturer for the minute m in question):

(1) The temperature of the exhaust gases o the flare (monitoring parameter $T_{EG.m}$) and the flow rate of LFG to the flare (monitoring parameter $F_{RG,m}$) is within the manufacturer's specification/requirements for the flare (monitoring parameter $SPEC_{flare}$) in minute m;

(2) Flame is detected in the flare in minute m (monitoring parameter $Flame_m$).

If for the minute m, conditions (1) and/or (2) are not met, $\eta_{flare,m}$ is set as 0% for the minute in question. (…)"

Furthermore, while Flare 2 and Flare 3 are regarded as a low height flare, the determined value of flare efficiency for this particular flare is adjusted, as a conservative approach, by subtracting 10 percentile points as established by the methodological tool "Project emissions from flaring" (version 03.0).

In applying Option A, for every minute m within the considered monitoring period, ηflare,m = 0.90 (90% – 10% = 0.80 (80%) (upon demonstration of full compliance with operational and maintenance requirements for the flare) or 0% (in case full compliance with operational and maintenance requirements for the flare in question is not demonstrated). As defined by the ex-ante determined parameter "Manufacturer's flare specifications for temperature, flow rate and maintenance schedule interval" ($SPEC_{flare}$), compliance with operational temperature range, flow rate range and required maintenance schedule interval is considered for the determination of the selected default value of $\eta_{flare,m}$ for the determination of $F_{CH4,flared,y}$ and its application along every minute m the considered monitoring period. The selection and application of the default value for $\eta_{flare,m}$ (80% or 0%) for each minute m of the considered monitoring period is presented in the monthly emission reduction calculation spreadsheets.

In summary, for the considered monitoring period, the values of $\eta_{flare,m}$ obtained for Flare 2 and Flare 3 are summarized below:

Determined (calculated)	Flare 2 ($\eta_{flare,m,flare-2}$)	Flare 3 ($\eta_{flare,m,flare-3}$)

reference values for $\eta_{flare,m}$ for the considered monitoring period	0.800000	0.800000

Confirmation/validation of the application of determined values of $\eta_{flare,m,flare-2}$ and $\eta_{flare,m,flare-3}$ for every minute of the considered monitoring period:
It is relevant to note that, as data records for the monitoring parameter "Flame detection of flare in the minute *m*" ($Flame_m$) are also considered for the confirmation of the application of the reference values of $\eta_{flare,m}$ for the determination of values of $F_{CH4,flared,y}$ along the considered monitoring period for every minute "*m*" of the considered monitoring period. For each installed flare, the time the flare has operated is determined by monitoring for every single minute "*m*" the flame combustion status/condition in each flare through status records of individual UV flame detectors installed in each flare (of which status signal (flame status "*on*" or "*off*") is continuously recorded and reported). It is also relevant to note that the monitoring requirements related to operational requirements/conditions for the flare (as established in the specifications for operational conditions defined by the flares' designer and manufacturer as per the ex-ante determined parameter $SPEC_{flare}$ (min. and max. flow of LFG to the flares + temperature of exhaust gas of the flares + meeting of maintenance requirements)) are also effectively considered in the context of the application of the reference values for $\eta_{flare,m}$ for Flare 2 and Flare 3 for every minute *"m"* of the considered monitoring period. As outlined in the monthly emission reduction spreadsheets, for each minute "*m"* of the considered monitoring period in which the given flare has combusted LFG by not operating in accordance with all the operational criteria as established by the ex-ante estimated parameter $SPEC_{flare}$ (in terms of LFG flow, temperature of exhaust gas or maintenance practice), the 0% value is directly applied for $\eta_{flare,m}$ and no destruction of methane is therefore accounted for the flare in question during the minute *m* as part of the calculation value of $F_{CH4,flared,y}$.

For the considered monitoring period, the accumulated value for $F_{CH4,PJ,y} = F_{CH4,flared,y} + F_{CH4,EL,y}$ is calculated as 14,384 tCH_4.

For the considered monitoring period, baseline emissions of methane from the SWDS ($BE_y = BE_{CH4,y}$) are calculated as 321,623 tCO_2e. The summarized emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report) summarizes the determination of $BE_y = BE_{CH4,y}$ for the considered monitoring period.

E.2. Calculation of project emissions or actual net removals

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Under conformance with provisions and calculation approaches of the PDD, project emissions (PE_y) for the considered monitoring period are determined (in tCO_2e) as follows:

$PE_y = PE_{EC,y} + PE_{FC,y}$

Where:

$PE_{EC,y}$	Project emissions from consumption of electricity due to the project activity (tCO_2/yr)
$PE_{FC,y}$	Project emissions from consumption of fossil fuels due to the project activity (for purpose other than electricity generation) (tCO_2/yr).

Project emissions due to the consumption of electricity by the project activity ($PE_{EC,y}$):

During the considered monitoring period, the electricity demand of the project activity was entirely met by electricity which is regarded as grid-sourced electricity[19].

While grid-sourced electricity and electricity generated by the backup captive off-grid electricity generator (fuelled by diesel) represent the sources of electricity consumed by the project activity, $PE_{EC,y}$ is thus calculated as follows:

$$PE_{EC,y} = PE_{EC,grid,y} + PE_{EC,captive,y}$$

Where:

$PE_{EC,grid,y}$ Project emissions from consumption of grid-sourced electricity by the project activity

$PE_{EC,captive,y}$ Project emissions from consumption of electricity generated by a captive off-grid electricity generator fuelled by fossil fuel (diesel)

For the considered monitoring period, $PE_{EC,grid,y}$ and $PE_{EC,captive,y}$ are determined as follows:

(i) Project emissions due to the consumption of grid-sourced electricity by the project activity ($PE_{EC,grid,y}$):

By directly applying applicable guidance of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0), project emissions due to the consumption of grid-sourced electricity by the project activity ($PE_{EC,grid,y}$) are calculated as follows:

$$PE_{EC,grid,y} = EC_{PJ,grid,y} * EF_{EL,grid,y} * (1 + TDL_{grid,y})$$

Where:

$TDL_{grid,y}$ Average technical transmission and distribution losses for grid-sourced electricity consumed by the project activity in year *y.* As per applied monitoring procedure, the value for $TDL_{grid,y}$ is determined 20%. Further details about the ex-post determination of the value for $TDL_{grid,y}$ are included in Section D.2.

$EC_{PJ,grid,y}$ Quantity of grid sourced electricity consumed by the project activity. As per the applied monitoring procedure, monthly records of consumption of electricity regarded as supplied by the grid valid for the considered monitoring period are summarized below:

[19] Under conformance with project design description outlined in the PDD, during the considered monitoring period, the project activity consumed only electricity sourced by the grid-connected electricity generation infrastructure fueled by LFG (of which the set of 19 internal combustion engines (project's methane destruction devices) represents major components) and grid-sourced electricity (during periods when the grid-connected electricity generation was not under operation, but supply of grid-sourced electricity was normal). As defined in the PDD, since emission reductions due to displacement of a more-GHG-intensive service (due to generation of electricity using collected LFG as fuel) are not eligible and/or claimable for the project activity, all consumption by the project activity of electricity generated by the grid-connected electricity generation infrastructure fuelled by LFG located within the geographical limits of the AMC landfill is to be regarded and accounted as consumption of grid-sourced electricity (with related project emissions being determined ex-post) as a conservative approach.

Month	Amount of electricity regarded as supplied by the grid consumed by the project activity (MWh)
May./2018 (27/05 to 31/05/2018)	17.221
Jun./2018	97.486
Jul/2018	112.398
Aug./2018	117.591
Sep./2018	108.030
Oct./2018	113.384
Nov./2018	106.431
Dec./2018	109.105

Additional monitoring details about the monitoring parameter $EC_{PJ,grid,y}$ are included in Section D.2.

$EF_{EL,grid,y}$ Emission factor for grid sourced electricity in year *y.* By taking into account the source of electricity to be consumed by the project activity (gird-sourced electricity and electricity sourced by backup captive off-grid electricity generator (fueled by diesel)), the PDD defines that the project activity fits under Scenario C with Case C.III of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) and the following generic approach is thus defined as applicable for the determination of $EF_{EL,grid}$:

> *"Where case C.III has been identified, as a conservative simple approach, the emission factor for electricity generation should be the more conservative value between the emission factor determined as per guidance for scenario A and B respectively. This means that the more conservative value should be chosen between a) the result of applying either option A1 or A2 and b) the result of applying either option B1 or B2."*

Determination of $EF_{EL,grid,y}$ as per Option A2:
Under Option A2, $EF_{EL,grid,y}$ is directly determined as 1.3 tCO2/MWh (applicable conservative default value as per methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation"). Further details for the ex-ante selected value of $EF_{EL,grid,y}$ under Option A2 is made available in Section D.1 and in the PDD.

Since 1.3 tCO_2/MWh represents the most conservative (higher) value for $EF_{EL,grid,y}$ under Option A1 (when compared to all the monthly average values for the months of 2018 encompassed by the considered monitoring period) and value selected under Option A2, this value is thus selected as the applicable value of $EF_{EL,grid,y}$ for the whole considered monitoring period.

For the considered monitoring period, the accumulated value of $PE_{EC,grid,y}$ is thus calculated as follows:

$PE_{EC,grid,y}$ = 781,646 MWh * 1.3 * (1 + 20%) = 1,219 tCO_2 (rounded value)

The summarized emission reduction calculation spreadsheet (that is enclosed to this Monitoring Report) includes all calculations related to the determination of the accumulated value of $PE_{EC,grid,y}$ for the considered monitoring period.

(ii) Project emissions due to the consumption of electricity sourced by backup captive off-grid electricity generator (fuelled by diesel) ($PE_{EC,captive,y}$):

By directly applying applicable guidance of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0), project emissions due to the consumption of grid-sourced electricity by the project activity ($PE_{EC,grid,y}$) are calculated as follows:

$$PE_{EC,captive,y} = EC_{PJ,captive,y} * EF_{EL,grid,y} * (1 + TDL_{captive,y})$$

Where:

$TDL_{captive,y}$ Average technical transmission and distribution losses for electricity sourced by the captive electricity generator in the project activity in year *y.* As per applied monitoring procedure, the value for $TDL_{captive,y}$ is determined 20%. Further details about the ex-post determination of the value for $TDL_{captive,y}$ are included in Section D.2.

$EC_{PJ,captive,y}$ Quantity of electricity consumed from captive diesel backup generator during the year y. As per the applied monitoring procedure, monthly records of consumption of electricity from captive diesel backup generator valid for the considered monitoring period are summarized below:

Month	Amount of electricity consumed from captive diesel backup generator (MWh)
May./2018 (from 27/05 to 31/05/2018)	0
Jun./2018	0
Jul/2018	0
Aug./2018	0
Sep./2018	17.883
Oct./2018	12.308
Nov./2018	57
Dec./2018	0
Jul/2018	0

Additional monitoring details about the monitoring parameter $EC_{PJ,captive,y}$ are included in Section D.2.

$EF_{EL,grid,y}$ Emission factor for grid sourced electricity in year *y.* By taking into account the source of electricity to be consumed by the project activity (gird-sourced electricity and electricity sourced by backup captive off-grid electricity generator (fueled by diesel)), the PDD defines that the project activity fits under Scenario C with Case C.III of the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) and the following generic approach is thus defined as applicable for the determination of $EF_{EL,grid}$:

> *"Where case C.III has been identified, as a conservative simple approach, the emission factor for electricity generation should be the more conservative value between the emission factor determined as per guidance for scenario A and B respectively. This means that the more conservative value should be chosen between a) the result of applying either option A1 or A2 and b) the result of applying either option B1 or B2."*

Determination of $EF_{EL,grid,y}$ as per Option A2:

Under Option A2, $EF_{EL,grid,y}$ is directly determined as 1.3 tCO2/MWh (applicable conservative default value as per methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation"). Further details for the ex-ante selected value of $EF_{EL,grid,y}$ under Option A2 is made available in Section D.1 and in the PDD.

Since 1.3 tCO_2/MWh represents the most conservative (higher) value for $EF_{EL,grid,y}$ under Option A1 (when compared to all the monthly average values for the months of 2018 encompassed by the considered monitoring period) and value selected under Option A2, this value is thus selected as the applicable value of $EF_{EL,grid,y}$ for the whole considered monitoring period.

For the considered monitoring period, the accumulated value of $PE_{EC,captive,y}$ is thus calculated as follows:

$PE_{EC,captive,y}$ = 30.248 MWh * 1.3 * (1 + 20%) = 48 tCO_2 (rounded value)

The summarized emission reduction calculation spreadsheet (that is enclosed to this Monitoring Report) includes all calculations related to the determination of the accumulated value of $PE_{EC,captive,y}$ for the considered monitoring period.

Total project emissions due to the consumption of electricity by the project activity ($PE_{EC,y}$) for the considered monitoring period are calculated as $PE_{EC,grid,y}$ + $PE_{EC,captive,y}$ and represents 1,267 tCO_2 (rounded value).

Project emissions from consumption of fossil fuels due to the project activity (for purpose other than electricity generation) ($PE_{FC,y}$):

During the considered monitoring period relatively low amount of Liquefied Petroleum Gas (LPG) was consumed for igniting project's high temperature enclosed flares. By following related provisions in the PDD, project emissions associated with consumption of fossil fuel (for purposes other than electricity generation) ($PE_{EC,y}$) are determined as follows:

$PE_{FC,y} = PE_{LPG,y}$

Where:

$PE_{LPG,y}$ Project emissions due to the consumption of Liquefied Petroleum Gas by the project activity in year y (in tCO_2/year). By directly applying valid guidance of the methodological tool "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (version 03) and under conformance with the PDD, $PE_{LPG,y}$ is determined as follows:

$PE_{LPG,y} = FC_{LPG,y} * COEF_{LPG,y}$

Where:

$FC_{LPG,y}$ Quantity of LPG consumed by the project activity in year *y*. As per the adopted monitoring procedure, during the considered monitoring $FC_{LPG,y}$ is determined as 0 kg of LPG. Additional monitoring details for the monitoring parameter $FC_{LPG,y}$ are included in Section D.2.

$COEF_{LPG,y}$ CO_2 emission coefficient for LPG. As established in the PDD, $COEF_{LPG,y}$ is determined by following applicable guidance of Option B of the methodological tool "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (version 03) as follows:

$COEF_{LPG,y} = NCV_{LPG,y} * EF_{CO2,LPG,y}$

Where:

$NCV_{LPG,y}$ Net calorific value of the fuel LPG (in GJ/ton LPG)

$EF_{CO2,LPG,y}$ CO_2emission factor of fuel LPG (in energy basis). As per the applied monitoring procedure, $EF_{CO2,LPG,y}$ is determined as 0.0656 tCO_2/GJ. Further details about the determination of the monitoring parameter $EF_{CO2,LPG,y}$ are included in Section D.2.

$NCV_{LPG,y}$ Net calorific value of the fuel LPG. As per the applied monitoring procedure, $NCV_{LPG,y}$ is determined as 49.2 GJ/ton for the considered monitoring period. Further details about the monitoring parameter $NCV_{LPG,y}$ are included in Section D.2

Thus, $COEF_{LPG,y}$ = 0.0656 tCO_2/GJ * 49.2 GJ/ton = 3.23 tCO_2/ton

In summary, $PE_{LPG,y}$ is calculated as follows:

$PE_{LPG,y}$ = 0 ton LPG * 3.23 tCO_2/ton LPG = 0 tCO_2 (rounded value).

Project emissions due to the consumption of LPG are thus determined as 0 tCO_2 (rounded value).

The summarized emission reduction calculation spreadsheet (that is enclosed to this Monitoring Report) includes all calculations related to the determination of the accumulated value of $PE_{LPG,y}$ for the considered monitoring period.

In summary, total project emissions (PE_y) for the considered monitoring period are calculated as $PE_{EC,y}$ + $PE_{LPG,y}$ and represents 1,267 tCO_2 (rounded value).

E.3. Calculation of leakage emissions

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Not applicable.

E.4. Calculation of emission reductions or net anthropogenic removals

Emission reductions achieved by the project activity during the considered monitoring period are determined as the difference between accumulated total values for baseline emissions (BE_y) and project emissions (PE_y) which are determined for such period as presented in Section E.1 and E.2 respectively.

During the considered monitoring period, achieved emission reductions are calculated and reported as follows:

	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	321,623	1,267	-	-	320,356	320,356

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante for this monitoring period in the PDD (t CO_2e)
320,356	308,174

E.5.1. Explanation of calculation of "amount estimated ex ante for this monitoring period in the PDD"

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The 308,174 tCO_2e value is calculated as the share of the previously determined ex-ante estimates of emission reductions valid for the 220-day period from 27/05//2018 to 31/12/2018. The value of ex-ante estimation of emission reductions as per the PDD that is valid/equivalent for the considered monitoring period is calculated as 511,289 * 220 / 365 tCO_2e.

E.6. Remarks on increase in achieved emission reductions

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Achieved emission reductions by the project activity during the considered monitoring period are about ~4% higher than the calculated equivalent value of ex-ante estimation of emission reductions valid for the same period as per the PDD. The following aspect(s) justify and explain the relative difference between the value for ex-ante estimation of emission reductions as per the PDD (calculated as valid/equivalent for the considered monitoring period) and emission reductions actually achieved by the project activity during the considered monitoring period:

Aspect/condition which represents an increase factor of reported emission reductions for the considered monitoring period when compared against the ex-ante estimation of emission reduction for the same period in the PDD:

- *Uncertainties associated with the application of First Order Decay (FOD) multi-phased model for estimating the emission reductions in the PDD:*
  As outlined in the PDD, like other similar CDM project activities encompassing LFG collection and destruction/utilization, the amount of methane to be generated by decomposition of MSW disposed at the AMC landfill and collected by the project activity was derived by applying the First Order Decay (FOD) model as per the methodological tool "Emissions from Solid Waste Disposal Sites" (version 08.0) in the context of the determination of ex-ante estimated emission reductions to be achieved during the 3rd and last 7-year renewable crediting period. By taking in account all potential uncertainties associated with the application of such multi-phased decay model, it is reasonable to assume that, in the particular case of the project activity during the considered monitoring period, the application of this model somehow slightly sub estimated the amount of LFG to be actually generated and collected by the project activity.

E.7. Remarks on scale of small-scale project activity

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Not applicable.

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Document information

Version	*Date*	*Description*
07.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).

Version	*Date*	*Description*
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.

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