CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for submission of CPAs that apply a small scale approved methodology using the provision of the proposed small scale CDM PoA.

(ii) The coordinating/managing entity shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)[1,2] that is specified to the proposed PoA by using the provisions stated in the SSC PoA DD. At the time of requesting registration the SSC PoA DD must be accompanied by a CDM-SSC CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC CPA-DD.

[1] The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

[2] At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

SECTION A. General description of small scale CDM programme activity (CPA)

A.1. Title of the small-scale CPA:

>> Los Olivos individual cells MOL Project
Version 01
20/04/2012

A.2. Description of the small-scale CPA:

>>

The project objective is the covering of **two individual cells** at a Solid Waste Disposal Site (SWDS) called ECOPRIAL LANDFILL with a Methane Oxidation Layer (MOL) also known as "Biocover". The MOL consists of Methane Oxidising Material (MOM), which is derived from stabilized biomass (SB) by composting.

Apart from socio-economic benefits, climate- effective goal of the MOL is the reduction of methane emissions from the closed cells at ECOPRIAL landfill in the baseline scenario by means of aerobe oxidation of the methane emitted from the core of the SWDS cells. The key element of the MOL is a layer of MOM (compost) that contains methanotropic bacteria which are able to oxidise the emitted methane from decay processes in the disposed waste. By the complete covering of a SWDS an oxidation factor near to 100% is achieved with low technical efforts at the application or monitoring period.

Based on investigations and calculations performed the project will generate 511 tCO_2 equivalents over the 10-years crediting period 2013-2022.

Like common closed landfills cells in rural areas in Chile the ECOPRIAL landfill site is a poorly controlled site without liner system, leachate collection and treatment, no landfill gas extraction and simple earth as final coverage. Hence, the baseline is crude waste disposal without any precautions to avoid the emission of methane. Like other rural regions in developing and emerging market countries, waste generated in Chiler shows a high content of organic matter. In this particular two closed cells at ECOPRIAL landfill over 90% of the solid waste consists of organic substances, mostly highly degradable organics. After disposal at dumpsites and landfill sites degradable organics generate massive methane emissions. According to the type of landfill operation technologies used, the amount of biodegradable waste disposed off, and the degradation conditions in the landfill, gas emissions are released at an environmentally relevant level over a time span of two to three decades, but even following landfill closure and capping gas emissions may continue to be manifested. Small emissions of gas are estimated to occur up to a period of 100 years.

An important cost-effective measure of reducing greenhouse active methane emissions from closed municipal solid waste landfills is to exploit the natural process of microbiological methane oxidation through improved landfill cover design. This oxidation process is usually mediated by a group of bacteria known as *methanotrophs*. Landfill top covers, which optimise environmental conditions for *methanotrophic* bacteria and enhance biotic methane consumption, are often called "*biocovers*".

Engineered manipulation of landfill covers to maximize oxidation capacity provides a strategy particularly for the control of methane emissions escaping gas collection, as well as for emission mitigation to smaller or older sites where methane production is too low for energy recovery or flaring, and installation of a gas extraction system is inefficient.

The project will be the first MOL-application in Chile. As a pioneering effort by the project participants, the project will contribute to the sustainable development in Osorno Province and in Republic of Chile.

The following environmental, economic and social benefits are to be achieved by executing the project:

1. Environmental benefits – significant reduction of methane emissions from waste disposal sites in ECOPRIAL Landfill and preventing uncontrolled methane generation from waste.

2. Economical benefits – The project will improve local economy by providing job opportunity to local people for the construction of the MOL.

3. Social benefits - jobs for local inhabitants and staff training to improve the skills of the local inhabitants.

A.3. Entity/individual responsible for the small-scale CPA:

>> Here the information on the entity/individual responsible of the CPA shall be included, hence forth referred to as CPA implementer(s). CPA implementers can be project participants of the PoA, under which the CPA is submitted, provided their name is included in the registered PoA.

Asesorías Los Olivos S.A. represented by Mr. Raúl Albrecht Barrientos

A.4. Technical description of the small-scale CPA:

A.4.1. Identification of the small-scale CPA:

>>
The CPA will be undertaken within Osorno commune, specifically in U-40 Route Km 5.2, Tenth Region of Los Lagos. To access the proposed site must be by the U-40 route, reaching 5.2 Km and is accessed via a private road within the property

A.4.1.1. Host Party:

>>
Republic of Chile

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

>>Geographic reference or other means of identification[3], Name/contact details of the entity/individual responsible for the CPA, e.g. in case of stationary CPA geographic reference, in case of mobile CPAs means such as registration number, GPS devices.

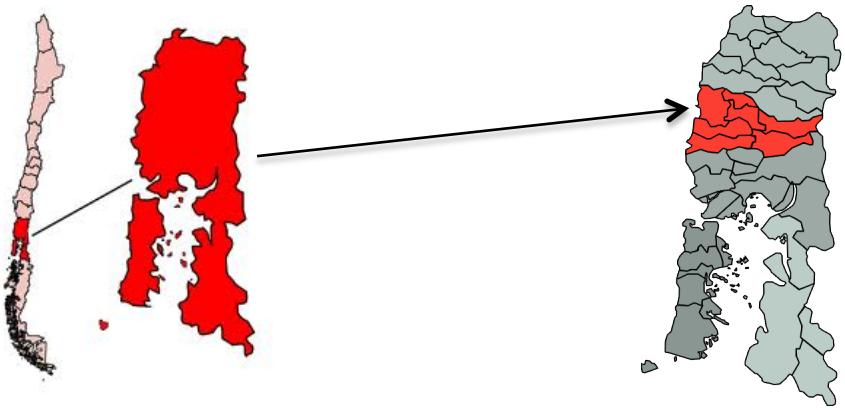
Coordinates: 40° 35′ 0″ S, 72° 10′ 0″ W

[3] E.g. in case of stationary CPA geographic reference, in case of mobile CPAs means such as registration number, GPS devices.

This project's located in south of Chile, in Osorno province, Los Lagos Region. The region has an area of 9,236 km^2, with a population of 218,577inhabitants, distributed in the districts of Rio Negro, Purranque, San Pablo, Puerto Octay, Puyehue, San Juan de la Costa, Osorno.

The city of Osorno is located 946 km south of the country's capital, Santiago, 110 km north of Puerto Montt (the regional capital), 110 km south of Valdivia (capital of Rivers Region) and 232 km Argentina west of the city of San Carlos de Bariloche, which is linked through the international route 215.

Figure N° 1. Location of Los Lagos Region (Osorno)



A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

>> August 2012 or the day of registration the PoA " Organic waste composting programme of activities " (whichever comes first)

A.4.2.2. Expected operational lifetime of the small-scale CPA:

>> The project would have a life span of 25 years

A.4.3. Choice of the crediting period and related information:

Fixed Crediting period

A.4.3.1. Starting date of the crediting period:

>> 1st January 2013

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

>> 10 years

NOTE: Please note that the duration of crediting period of any *CPA* shall be limited to the end date of the *PoA* regardless of when the CPA was added..

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

>>

Year	Annual estimation of emission reductions in tonnes of CO2e
2013	93
2014	87
2015	72
2016	60
2017	50
2018	41
2019	34
2020	31
2021	23
2022	20
Total estimated reductions (tonnes of CO2e)	511
Total number of years in first crediting period	10
Annual average estimated reductions, first crediting period (tonnes of CO2e)	51

A.4.5. Public funding of the CPA:

>> The CPA will not receive any national or international public funding for the development of the proposed project.

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

>>

In order to ensure that "Los Olivos individual cells MOL Project "is not a de-bundled component of another CDM project or CPA, the CME will proceed according to the "Guidelines on assessment of debundling for SSC project activities v3" EB54 Annex 13 para 8, Section II - Guidance for determining the occurrence of de-bundling under a Programme of Activities (PoA) or the latest available rules on debundling at the time of the CPA inclusion.

"For the purposes of registration of a Programme of Activities (PoA), a proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity, which satisfies both conditions (a) and (b) below:

(a) Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same technology/measure, and;

(b) The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point."

There is no previous activity in the area with the same activity implementer nor is there a boundary within 1 km of the boundary of the proposed small-scale CPA at the closest point. Therefore the CPA is not a debundled component of a large scale activity.

A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

>>

The present small-scale CPA is not registered as an individual CDM project and is not part of another PoA

The CPA proponent confirms in writing that the present SSC-CPA is not registered as an individual CDM project and is not part of another registered PoA. The CME has exhaustively checked the UNFCCC database and confirms that the present SSC -CPA is not registered as an individual CDM project and is not part of another registered PoA, as described in section A.4.4.1 of the proposed SSC-PoA-DD.

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

>>

Title of the PoA: "Methane avoidance in closed landfill and/or individual cells Programme of Activity"
This CPA is part of the request for registration of the above mentioned PoA.

B.2. Justification of the why the small-scale CPA is eligible to be included in the Registered PoA :

>>

Eligibility criteria	Compliance with the eligibility criteria
The CPA is within the Republic of Chile and hence its boundary is consistent with the geographical boundary of the PoA.	The CPA is located within the Republic of Chile
The CPA would be a private company or public entity (such as a municipality)	The CPA is a private company
Documentary evidence that the start date of the CPA is not prior to the commencement of validation of the programme of activities.	The CPA is not prior to the commencement of validation of the programme of activities.
The CPA Operator shall demonstrate that the project activity not lead to double counting .	The CPA implementer confirms in writing that the project activity not lead to double counting.
CPA will meet the requirements including applicability criteria of the latest version of AMS.III.AX.	The CPA will met the requirements including applicability criteria of AMS.III.AX.
An agreement shall be in place between the CPA and the Coordinating and Managing Entity (CME), authorizing the CME to include the CPA into the PoA and therefore ceding the carbon rights to the CME.	An agreement was signed between the CPA and the Coordinating and Managing Entity (CME), authorizing the CME to include the CPA into the

	PoA and therefore ceding the carbon rights to the CME.
The CPA shall take responsibility for operating the avoidance methane emission project, as per the guidelines and training provided in the program.	The CPA shall take responsibility for operating the avoidance methane emission project, as per the guidelines and training provided in the program.
At the time of inclusion of the CPA in the PoA, there is no enforced regulation in Chile that prohibits the current disposal of MSW (landfilling).	At the time of inclusion of the CPA in the PoA, there is no enforced regulation in Chile that prohibits MSW into a solid waste disposal site (landfilling).
The maximum distance for transporting compost or compost-like materials for the MOL construction will be 200 km.	The maximum distance for transporting compost or compost-like materials for the MOL construction will be 200 km.
CPA must be in compliance with all laws and regulations of Chile.	CPA is in compliance with all laws and regulations of Chile.
No diversion of official development assistance has taken place in case the CPA receives funding from an Annex I parties.	The CPA do not receives funding from an Annex I parties.

B.3. Assessment and demonstration of additionality of the small-scale CPA , as per eligibility criteria listed in the Registered PoA:

>>

Related to the project activity foreseen, the following baseline scenarios have been analysed within a feasibility study:

Potential baseline scenarios	Probability
Continuation of the current situation without project activity.	Most likely situation since there are no legal regulations enforcing the engineered covering of SWDS.
Project activity without the implementation of the CDM.	Not probable because of financial and technical barriers
Combustion of the emitted methane with production of electricity	Methane concentrations and volume flux are too low for energy recovery.
Flaring the emitted methane	Not probable because of financial and technical barriers. Methane concentrations are too low for flaring.

The analysis shows that the continuation of the current situation is the most likely baseline scenario, with continuous methane emissions due to the anaerobic decay of organic waste in uncontrolled conditions. According to Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the additionality of the project activity could be assessed following the criteria below:

Investment barrier

As mentioned above, a financially more viable alternative to the project activity without CDM is the continuation of the present situation due to both the avoidance of capital investments and the almost zero maintenance costs when leaving the landfill in the current condition. In general, non engineered kinds of landfill covers (such as simple soil coverage) are the cheapest method of landfill closure and this procedure is quite popular due to endemic budget constraints of the landfill operators (usually in developing and emerging market countries not more than 1 $/ton is available to cover all costs for final disposal including the operation of the actual site. Significant increase of waste fees is a difficult political task. Even in case it is achieved the available budget is soaked by more urgent tasks such as improvements of collection and recycling, which are either visible to the citizens or prosperous in terms of additional revenues (from valuable goods).

Technological barrier

A less technologically advanced alternative to the project activity is the continuation of the present situation or non engineered simple landfill covers (layer of soil). The current situation is a complepte absence of any technology and thus has a much lower standard than the foreseen technology of the project activity. Basically, producing MOM and constructing the MOL are controlled processes which require an advanced understanding of biological processes inside the construction materials as well as technical excellence in terms of process controll (laboratory methods for quality management) and logistic requirements. MOL has not been realised in Chile, yet. Experiences from other MOL projects in developed first world countries prove that the implementation of this technology faces major barriers.

Barrier due to prevailing practice

The current situation complies with the laws and regulatory requirements for the project location. No national landfill ordinance has been enforced so far, and most likely will not be enforced within the crediting period, which demands improvements compared to this situation. Due to this common practice, the MOL (as well as any other advanced waste management and landfill activities) suffers an unfavourable competition with low cost solutions.

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

>>

	Source	Gas		Justification / Explanation
Baseline	Emissions from decomposition of waste at the landfill site	CH_4	Included	The major source of emissions in the baseline
		N_2O	Excluded	N_2O emissions are small compared to CH_4 emissions from landfills. Exclusion of this gas is conservative
		CO_2	Excluded	CO_2 emissions from the decomposition of organic waste are not accounted[a]
	Emissions from electricity consumption	CO_2	Excluded	Excluded for simplification. This is conservative
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
	Emissions	CO_2	Excluded	Thermal energy generation is not included in the PoA

[a] CPAs wishing to neglect these emission sources shall follow the clarification in Annex 2 of EB 22 report which states that "magnitude of emission sources omitted in the calculation of project emissions and leakage effects (if positive) should be equal to or less than the magnitude of emission sources omitted in the calculation of baseline emissions".

	Source	Gas		Justification / Explanation
	from thermal energy generation	CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
Project Activity	On-site fossil fuel consumption due to the project activity other than for electricity generation	CO_2	Included	May be an important emission source. It includes vehicles used on-site, etc [4]
		CH_4	Excluded	Excluded for simplification. This emission source is assumed to be very small
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small
	Emissions from on-site electricity use	CO_2	Included	May be an important emission source. [5]
		CH_4	Excluded	Excluded for simplification. This emission source is assumed to be very small
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small
	Emissions from thermal energy generation	CO_2	Excluded	Thermal energy generation is not included in the PoA
		CH_4	Excluded	Thermal energy generation is not included in the PoA
		N_2O	Excluded	Thermal energy generation is not included in the PoA
	Direct emissions from the waste treatment processes.	N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		CO_2	Excluded	Incineration, gasification or combustion of fossil based waste are not included in the PoA.
		CH_4	Included	The composting process may not be complete and result in anaerobic decay.
	Emissions from waste water treatment	CO_2	Excluded	Wastewater treatment is not included in the PoA.
		CH_4	Excluded	Wastewater treatment is not included in the PoA.
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

>>

Data / Parameter:	φ
Data unit:	-
Description:	Model correction factor to account for model uncertainties
Source of data used:	Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site
Value applied:	0,9

[4] This source will no significant at CPAs where Aerated Static Pile (ASP) composting technology will be used.
[5] This source will no significant at CPAs where Aerated Static Pile (ASP) composting technology by natural convection (passive aeration) will be used.

Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value from the Tool is applied
Any comment:	

Data / Parameter:	f
Data unit:	-
Description:	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
Source of data used:	Baseline information
Value applied:	0 (currently no methane is captured and flared or combusted in another manner at the SWDS)
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	OX
Data unit:	-
Description:	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Source of data used:	Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied :	The baseline SWDS of the project has no oxidizing covering material.
Any comment:	

Data / Parameter:	F
Data unit:	-
Description:	Fraction of methane in the SWDS gas (volume fraction)
Source of data used:	Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site
Value applied:	0,5
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value from the Tool is applied

Any comment:	

Data / Parameter:	DOC_f
Data unit:	-
Description:	Fraction of degradable organic carbon (DOC) that can decompose
Source of data used:	Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site
Value applied:	0,5
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value from the Tool is applied
Any comment:	

Data / Parameter:	MCF
Data unit:	-
Description:	Methane correction factor
Source of data used:	Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site
Value applied:	0,8
Justification of the choice of data or description of measurement methods and procedures actually applied :	Depth of baseline SWDS is greater than 5 meter with high water table. Default value for "unmanaged solid waste disposal sites – deep and/or with high water table" from the Tool is applied.
Any comment:	

Data / Parameter:	Wx
Data unit:	tons
Description:	Total amount of organic waste type j disposed on the SWDS in the year x
Source of data used:	Local geographical and historical values
Value applied:	1.400 for two closed cells (disposal between 2009-2010)
Justification of the choice of data or description of measurement methods and procedures actually applied :	The W_x prior to the project implementation is cited from local geographical, geodetic and historical values.
Any comment:	

Data / Parameter:	k_j
Data unit:	-

Description:	Decay rate for the waste type j
Source of data used:	Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site
Value applied:	The following values for the different waste types j were applied:

Waste type j	k_j
C - Food, food waste, beverages and tobacco (other than sludge)	0.185

Justification of the choice of data or description of measurement methods actually applied :	
Any comment:	The used values are for following conditions: MAT ≤ 20°C and MAP/PET > 1 [If these conditions are not met the k_j factor should be corrected]

Data / Parameter:	DOC_j
Data unit:	-
Description:	Fraction of degradable organic carbon (by weight) in the waste type j
Source of data used:	Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site
Value applied:	The following values for the different waste types j were applied:

Waste type j	DOC_j (%)
C - Food, food waste, beverages and tobacco (other than sludge)	15

Justification of the choice of data or description of measurement methods actually applied :	
Any comment:	The applied values reflect wet waste.

Data / Parameter:	x
Data unit:	years
Description:	Disposal period
Source of data used:	Local historical values
Value applied:	x runs from 2009 to 2010
Justification of the choice of data or description of measurement methods applied :	
Any comment:	

Data / Parameter:	NCV_{fuel}
Data unit:	MJ/kg
Description:	Caloric value of fuel (diesel)
Source of data used:	2006 IPCC Guidelines, Energy
Value applied:	43.3

Description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	EF_{fuel}
Data unit:	tCO2e/MJ
Description:	Emission factor of Diesel
Source of data used:	Emission Factor for Diesel-IPCC standard value
Value applied:	7.41E-05
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	OX_{MOL}
Data unit:	-
Description:	Oxidation factor of MOL
Source of data used:	Methodology
Value applied:	0.9
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

B.5.2. Ex-ante calculation of emission reductions:

>>

Baseline emissions

$$BE_y = BE_{CH4,SWDS,y} \bullet Af_{MOL,y}$$

and

$$BE_{CH4,SWDS,y} = \varphi \bullet (1-f) \bullet GWP_{CH4} \bullet (1-OX) \bullet \frac{16}{12} \bullet F \bullet DOC_f \bullet MCF \bullet \sum_{x=1}^{y} \sum_{j} W_{j,x} \bullet DOC_j \bullet e^{-k_j \bullet (x-y)} \bullet (1-e^{-k_j})$$

The landfill area which will be covered with MOL constituted by two individual cells where the disposal occurred from 2009 to 2010

Table B.2 – data applied and its justification for ex-ante calculation of emissions due to the SWDS

Parameter	Value	Unit	Description	Source
φ	0.9	-	Model correction factor to account for model uncertainties	Default
f	0	-	Fraction of methane captured at the SWDS and flared, combusted or used in another manner	Project
GWP_{CH4}	21	tCO_2/tCH_4	Global Warming Potential (GWP) of methane, valid for the relevant commitment period	Tool *)
OX	0	-	Oxidation factor	Tool *)
F	0.5	-	Fraction of methane in the SWDS gas	Tool *)
DOC_f	0.5	-	Fraction of degradable organic carbon (DOC) that can decompose	Tool *)
MCF	0.8	-	Methane correction factor	Tool *)
$W_{j,x}$	1,400	t	Amount of organic waste type *j* disposed in the SWDS in the year *x*	Project
DOC_j	15%	-	Fraction of degradable organic carbon (by weight) in the waste type *j*	Tool *)
kj	0.185	-	Decay rate for the waste type *j*	Tool *)
j	Food Waste		Waste type category (index)	IPCC Guidelines **)
x	Runs from 2009 to 2010 .	years	Year during the crediting period: x runs from the first year of disposal to the year when disposal stopped	Project
y	Runs from 2013 to 2022	years	Year for which methane emissions are calculated	Project
$BE_{CH4,SWDS,y}$	Table B.4	tCO_{2e}	Methane generation from the SWDS	Calc. result

*) Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site

**) Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 5 (waste),

Table B.3. – waste data applied for ex-ante calculation of baseline emission of the closed cells area

Category (j)	A	B	C	D	E	F
	Wood	Paper	Food	Textile	Green	Inert
$W_{j,x}$	0	0	1,400	0	0	0
DOCj	0.43	0.4	0.15	0.24	0.2	0
kj	0.03	0.06	0.185	0.06	0.1	0

$BE_y = BE_{CH4,SWDS,y} \bullet Af_{MOL,y}$

It is planned that the MOL application lasts two weeks for the grandfathered area and for the first extension area of the SWDS.

Table B.4 – Calculation of baseline emissions

Year	Total baseline emissions (tCO2e)
2013	116
2014	97
2015	80
2016	67
2017	56
2018	46
2019	38
2020	32
2021	26
2022	22
Total	580

Project Activity Emissions

$$EF_{CO2} = NCV_{fuel} \bullet EF_{fuel} \bullet FC \bullet d_{fuel}$$

Table B.5 – Calculation table of the emission factor for transportation

Parameter	Value	Unit	Description	Source
NCV_{fuel}	43.33	MJ/kg	Caloric value of fuel	IPCC
EF_{fuel}	7.41E-05	tCO2e/MJ	Global Warming Potential of Diesel	IPCC
FC	0.30	L/km	Average fuel consumption	Estimation
d_{fuel}	0.85	kg/L	Density of fuel	-
EF_{CO2}	8.19E-04	tCO2/km	CO2 emission factor from fuel use due to transportation	Calculation result

$$PE_{y,transp} = \sum EF_{CO2} \bullet (Q_{y,m} / CT_{y,m}) \bullet DAF_{m\,m}$$

Table B.6 – Calculation table of the project emissions due to transportation

Parameter	Value	Unit	Description	Source
$Q_{y,SB}$	0	t	Quantity of stabilized biomass transported in year y	Project
$Q_{y,excesse}$	0	t	Quantity of excess material transported in year y	Estimation
$Q_{y,MOM}$	800	t	Quantity of MOM transported in year y	Estimation
$Q_{y,DM}$	100	t	Quantity of distribution material transported in year y	Estimation
$CT_{y,m}$	10	t/truck	Average truck capacity for transportation of SB, MOM, excess and distribution material	Estimation
$DAF_{SB,excess}$	0	km/truck	Average incremental distance for transportation of SB and refuse	Estimation
$DAF_{MOM,DM}$	5	km/truck	Average distance for transportation MOM and distribution material	Project
EF_{CO2}	8,19E-04	kgCO2/km	CO2 emission factor from fuel use due to transportation	Calculated
$PE_{y,transp}$	11	tCO2e	Emissions due to transportation during the year y	Calculation result

$PE_{y,power} = F_{cons,y} * NCV_{fuel} * EF_{fuel}$

Table B.7 – Calculation table of project activity emissions due to on-site fuel consumption

Parameter	Value	Unit	Description	Source
$F_{cons,y}$	30	kg	Fuel (diesel) consumption on site in year y	Estimation
NCV_{fuel}	43,33	MJ/kg	Caloric value of fuel	IPCC
EF_{fuel}	7,41E-05	tCO2e/MJ	Global Warming Potential of Diesel	IPCC
$PE_{y,power}$	9	tCO2e	CO2 emissions due to on-site fuel combustion in year y	Calculation result

$$PE_{y,MOL} = BE_y \bullet \left(1 - OX_{MOL,y}\right)$$

using $OX_{MOL,y} = 90\ \%$

and

$$PE_y = PE_{y,transp} + PE_{y,power} + PE_{y,MOL}$$

Table B.8 – Calculation table of the project activity emissions

Year	Transport emissions (tCO2e)	Electricity or fossil fuel emissions (tCO2e)	Residual methane emissions (tCO2e)	Project Activity Emissions (tCO2e)
2013	11	0	12	23
2014	0	0	10	10
2015	0	0	8	8
2016	0	0	7	7
2017	0	0	6	6
2018	0	0	5	5
2019	0	0	4	4
2020	0	0	3	3
2021	0	0	3	3
2022	0	0	2	2
Total	11	0	60	71

Leakage: No leakage effects are expected.

B.5.3. Summary of the ex-ante estimation of emission reductions:

>>

Year	Estimation of project activity emissions (tonnes of CO_2 e)	Estimation of baseline emissions (tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of overall emission reductions (tonnes of CO_2 e)
2013	23	116	0	93
2014	10	97	0	87
2015	8	80	0	72
2016	7	67	0	60
2017	6	56	0	50
2018	5	46	0	41
2019	4	38	0	34
2020	3	32	0	31
2021	3	26	0	23
2022	2	22	0	20
Total (tonnes of CO_2 e)	71	580	0	511

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

>>

The monitoring plan as described in section E.7 of the "Methane avoidance in closed landfill and/or individual cells Programme of Activity" PoA-DD, under which this CPA is being proposed, will be followed.

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

☐ Please tick if this information is provided at the PoA level. In this case sections C.2. and C.3. need not be completed in this form.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>>

The project might have some environmental impacts such as air pollution, noise and odour emissions, etc. which may occur along with MOL construction. However, the project's overall impact on environment will be small, and be reduced to minimum by implementation of project.

Negative impacts that may occur on environment during construction and operation include as follows;

<Construction>

• Air pollution, through the use of fossil fuel on vehicles required for transportation of MOL construction, and machinery required for construction.
• Generation of noise to some extent, due to material transportation, number of worker increase, installing of facilities, etc.

These negative impacts shall be reduced by taking the appropriate mitigation measures. In addition, all the potential negative impacts were taken into account in the environmental management plan which was developed in accordance with the Environmental Impact Statement (DIA) defined by the 19.300 Law

Positive environmental impacts of the project activity are as follows;

• Significant decrease of methane generation due to organic waste degradation in the landfill, which contributes to avoiding the GHG emissions
• Decrease of fire and explosions risk in the landfill site caused by methane emissions from disposed organic waste
• Recovery of recycled materials (compost)

C.3. Please state whether an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA), in accordance with the host Party laws/regulations:

>>

Because the CPAs under this POA has tight project boundaries with low environmental impacts confined within these boundaries then the CPA owner require to submit and approve an Environmental Impact Statement (DIA) under Chilean Law.

However, very small CPAs probably does not even require to submit a DIA this situation will be sanctioned by the National environmental authority on case-by-case basis according to the merit of each CPA.

The DIA was presented in the form of a sworn statement, in which the responsible party (the proponent) states that the project or activity complies with ruling environmental legislation (Art. 18 – Law 19,300).

The resolution classifying an DIA as positive or negative has the nature of a environmental permit, because if it is positive, no state agency can deny the relevant environmental authorizations, and if it is negative, state agencies are obliged to deny the corresponding authorizations or relevant environmental permits (Art. 24 – Law 19,300).

SECTION D. Stakeholders' comments

>>

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

☐ Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

>>

The following ***Public Consultation Process*** (PCP) activities will performed by each CPA owner:

a) 02 public announcements in a regional newspaper.
b) Letters to all the local authorities and/or neighbors was sent explaining the project.

The PCP will be developed following crystal-clear procedures and tried to cover the interested parties and/or by those (eventually) affected by the CPA.

D.3. Summary of the comments received:

>>

To be collected. The full list of received comments will be available during validation site visit.

D.4. Report on how due account was taken of any comments received:

>>

The comments received from the stakeholders will be incorporated into the design of the program including the implementation arrangements.

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-SCALE CPA

Organization:	Asesorías Los Olivos S.A
Street/P.O.Box:	Av. Pilauco Nº 1200
Building:	
City:	Osorno
State/Region:	Tenth Region of Los Lagos
Postcode/ZIP:	
Country:	Chile
Telephone:	+5664 - 202572
FAX:	+5664 - 202572
E-Mail:	cdmlfg@gmail.com
URL:	
Represented by:	Raúl Albrecht Barrientos
Title:	General Manager
Salutation:	Mr.
Last name:	Albrecht
Middle name:	
First name:	Raúl
Department:	
Mobile:	+56 - 9 9 886 54 54
Direct FAX:	
Direct tel:	
Personal e-mail:	cdmlfg@gmail.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The CPA does not receive any public funding.

Annex 3

BASELINE INFORMATION

Annex 4

MONITORING INFORMATION

- - - - -