



**Supplement to the Carbon Credits (Carbon Farming
Initiative—Animal Effluent Management)
Methodology Determination 2019**

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Contents

Part 1—Preliminary	4
1 <u>Name</u>	4
2 <u>Entry into effect</u>	4
3 <u>Definitions</u>	4
4 <u>Section 5—definition of ‘default capacity’</u>	4
5 <u>Section 5—definition of ‘listed types’</u>	4
Part 2—Matters referred to in Parts 1 to 3 in the Determination	5
6 <u>Section 9—Capacity of the project facility</u>	5
7 <u>Section 13—Flare operation for methane destruction projects</u>	5
8 <u>Section 14—Emissions avoidance treatment facility—solids separation method</u>	5
9 <u>Section 14—Emissions avoidance treatment facility—post-diversion treatment</u>	5
10 <u>Section 15—Evidence that satisfies the Regulator that the specified organic effluent would have been treated in an anaerobic pond</u>	6
Part 3—Matters referred to in Part 4 in the Determination – Net abatement amount	7
11 <u>Sections 16, 25 and 27—Measurement of methane-producing capacity</u>	7
12 <u>Section 24—Measuring the quantity of biogas sent to a combustion device, $Q_{biogas, i}$</u>	7
13 <u>Section 24—Measuring the proportion of methane in biogas, $W_{BG, CH4}$</u>	8
14 <u>Section 24—Measuring the methane destruction efficiency of a combustion device, DE_i</u>	8
15 <u>Section 24—Measuring the total amount of electricity produced by combustion device, $Q_{FG, i}$</u>	9
16 <u>Section 24—Measuring the electrical efficiency of the combustion device, $Effi$</u>	9
17 <u>Section 25—Methane Conversion Factor, MCF_n</u>	9
18 <u>Determining the amount of volatile solids in material type w</u>	10
19 <u>Section 30—fuel use attributable to operation of project facility, $Q_{F, i}$</u>	12
20 <u>Section 31—the amount of purchased electricity that is specifically attributable to the operation of the project facility, Q_{PE}</u>	12
21 <u>Section 32—post-diversion methane conversion factor, $MCF_{post, n}$</u>	12
22 <u>Section 32—the methane-producing capacity for the volatile solids, $B_{0, Div, w}$</u>	12
23 <u>Section 32—nitrous oxide conversion factor, N_2O-N_{CF}</u>	13
24 <u>Section 32—nitrous oxide emission factor, $INOEF_{post, n}$</u>	13
25 <u>Section 32—the amount of nitrogen in material type w, $N_{Div, w, n}$</u>	13
Part 4—Recordkeeping	15
26 <u>Sections 38 and 39—Record-keeping requirements</u>	15
27 <u>Section 39—Biogas composition for methane destruction projects</u>	15
28 <u>Section 41—Monitoring equipment</u>	15
Part 5—Monitoring	17
29 <u>Section 41—Monitoring requirements</u>	17
30 <u>Biogas measurement error margins</u>	17
Schedule 1—Default methane-producing capacities for types of material	18
Schedule 2—Treatment method—Solids Separation	20
Schedule 3—Process for updating the Supplement	21

Part 1—Preliminary

1 Name

This is the *Supplement to the Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019*.

2 Entry into effect

- (1) This Supplement comes into effect on the commencement of the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019*.
- (2) A statement on the intended process for updating the Supplement is at Schedule 3.

3 Definitions

In this instrument:

Determination means the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019*.

NATA means the National Association of Testing Authorities Australia (ACN 004 379 749).

US EPA Method followed by a reference to a method number (for example, Method 3C) means a standard of that description issued by the United States Environmental Protection Agency.

4 Section 5—definition of ‘default capacity’

For the definition of ‘default capacity’ in the Determination, the default capacity of the methane-producing capacities of listed types of material are specified in Schedule 1. They differ depending upon which equation the capacity is used.

5 Section 5—definition of ‘listed types’

- (1) For the definition of ‘listed types’ in the Determination, each of the material types listed in Schedule 1 is specified as a listed type.
- (2) However, if material of a listed type is treated by an anaerobic digester, the residual material from that digester is not material of a listed type.

Note: The methane producing capacity of such residual material would need to be measured under section 11.

Part 2—Matters referred to in Parts 1 to 3 in the Determination

6 Section 9—Capacity of the project facility

For section 9 of the Determination, the capacity of the facility must be specified using the following metrics:

- (a) for a project facility that treats organic effluent by emissions destruction—ML or m³ of organic effluent treated by the facility per year; and
- (b) for a project facility that treats organic effluent by emissions avoidance—tonnes per year.

7 Section 13—Flare operation for methane destruction projects

- (1) For section 13 of the Determination, and for the purposes of determining the destruction efficiency DE_i of the flaring system (subsection 24(2) of the Determination), this section sets out the requirements for determining whether a flaring system used in the project is operational.
- (2) Subject to subsection (3), if for any particular hour:
 - (a) there is no record of the flare being operational for a period exceeding 30 minutes in that hour; or
 - (b) there is other evidence which indicates that the flare is not operational for a period exceeding 30 minutes;then it must be assumed that during that hour the flare destruction efficiency is zero.
- (3) A flare is operational if the continuous presence of a flame is detected using:
 - (a) an ultra-violet beam sensor; or
 - (b) a thermocouple; or
 - (c) a temperature sensor; or
 - (d) an equivalent device that automatically detects the presence or absence of the flame.

8 Section 14—Emissions avoidance treatment facility—solids separation method

For section 14 of the Determination, the requirements for the use of a solids separation method of diversion are set out in Schedule 2.

9 Section 14—Emissions avoidance treatment facility—post-diversion treatment

For section 14 of the Determination, the post-diversion treatment must:

- (a) take into account industry best practice to ensure the treatment facility complies with subsection 7(4) of the Determination; and
- (b) ensure that stockpiles do not become large or compacted so as to create significant emissions of methane or nitrous oxide; and
- (c) be carried out consistently with the definitions of composting (passive windrow) or stockpiles (solid storage) in the Determination.

Note: The storage of solids is expected to typically be in small stockpiles (approximately 5m diameter x 2m high) or windrows (approximately 3m wide and 2m high) so as to reduce the amount of methane produced.

10 Section 15—Evidence that satisfies the Regulator that the specified organic effluent would have been treated in an anaerobic pond

- (1) For paragraph 15(2)(b) of the Determination, organic effluent from new or expanded piggeries is specified.
- (2) For paragraph 15(2)(b) of the Determination, evidence that satisfies the Regulator that organic effluent specified by subsection (1) would have been treated in an anaerobic pond must include:
 - (a) an explanation of why material would have been treated in an anaerobic pond; and
 - (b) an explanation of why paragraph 15(2)(a) of the Determination does not apply; and
 - (c) a signed statement from the owner of the facility that produced the material:
 - (i) verifying that without the project the material would have been treated in an anaerobic pond; and
 - (ii) providing the details and location of the existing or proposed pond which would have treated the material.

Part 3—Matters referred to in Part 4 in the Determination – Net abatement amount

11 Sections 16, 25 and 27—Measurement of methane-producing capacity

Note: This section refers to the measurement of the methane-producing capacity. For the default methane-producing capacity of a material w for section 27 of the Determination, see section 4 and Schedule 1.

- (1) For sections 16 and 27 of the Determination, the methane-producing capacity of material of type w must be assessed before treatment of the material has commenced.
- (2) For section 25 of the Determination, the methane-producing capacity of material of type w must be measured immediately after the material has been diverted.
- (3) Subject to subsection (5), all measurements of the methane-producing capacity of the material must be determined at least annually by:
 - (a) collecting, transporting and analysing samples of the waste type on at least three separate occasions in accordance with:
 - (i) the approach outlined by Christof Holliger and others in “Towards a standardization of biomethane potential tests” in *Water Science and Technology* (2016); or

Note: In 2019, this could be accessed at:
https://repositorium.sdum.uminho.pt/bitstream/1822/43883/1/document_44173_1.pdf
 - (ii) an equivalent Australian or international standard; and
 - (b) causing each of those samples to be:
 - (i) kept cold in a sealed container by storing and shipping on ice (but not frozen) or in a refrigerator until analysed; and
 - (ii) analysed in a laboratory in triplicate; and
 - (iii) subtracting the background methane production of any inoculum that was used in the test.
- (4) Methane-producing capacity must be measured in a laboratory throughout the test, and the measurement data is to be fitted with a suitable and statistically significant kinetic model to estimate the maximum achievable methane-producing capacity to be reported in units of cubic metres per tonne of volatile solids added.
- (5) If the material of a listed type is diverted by an emissions avoidance treatment method immediately after entering the facility, the project proponent may choose to use the default methane-producing capacity for that type specified in Schedule 1 for the relevant equation.

12 Section 24—Measuring the quantity of biogas sent to a combustion device,

Q_{biogas, i}

- (1) The total volume of biogas sent to combustion device i during a reporting period ($Q_{\text{biogas}, i}$) must be measured in accordance with the following requirements:
 - (a) the biogas flow must be:
 - (i) measured as close to the delivery location of the gaseous fuel to the combustion device as is safely possible;
 - (ii) measured using a continuous monitoring system; and
 - (iii) recorded in cubic metres (m^3).
- (2) Biogas flow must be measured using equipment that:

- (a) is rated for use with raw biogas which may contain corrosive ingredients such as hydrogen sulphide, entrained aerosols and fine particulate matter;
 - (b) is rated for use at the expected flow rates and pressures for the combustion devices being used;
 - (c) is designed for use in the anticipated operating temperature range; and
 - (d) is accurate to +/- 5% for flow measurement.
- (3) Gas flow must be continuously recorded and integrated using an integration device that is isolated from the flow computer in such a way that if the computer fails, the integration device will retain the previously stored data that was on the computer immediately before the failure.

Note: Section 42 of the Determination includes a process for making a conservative estimate of gas flow if equipment has failed for a period. This process would need to take account of any potential seasonal variation in gas flow.

- (4) All measurements must comply with the *National Measurement Act 1960*.

13 Section 24—Measuring the proportion of methane in biogas, W_{BG, CH_4}

- (1) The proportion of methane in biogas (W_{BG, CH_4}) must be:
- (a) a default value calculated under subsection (2); or
 - (b) measured under subsection (3).
- (2) The default values for proportion of methane in biogas (W_{BG, CH_4}) are:
- (a) if over 95% of the biogas is likely to have been produced from piggery effluent—70%; or
 - (b) if over 95% of the biogas is likely to have been produced from dairy effluent—60%; or
 - (c) otherwise—50%.
- (3) When the proportion of methane in biogas (W_{BG, CH_4}) must be measured, it is to be measured using either:
- (a) an inline gas analyser; or
 - (b) analysis, taken from samples, and performed at an accredited laboratory.
- (4) Where subsection (3)(b) applies, the following requirements apply:
- (a) biogas composition samples must be taken as close to the delivery location of the gaseous fuel as is safely possible;
 - (b) biogas composition samples must be taken at least monthly;
 - (c) biogas composition analysis must be based on triplicate samples collected in accordance with subparagraphs (a) and (b);
 - (d) the sampling train must be gastight;
- (5) The biogas composition must be accurate to +/- 3% absolute.
- (6) All measurements must be taken in accordance with the instrument manufacturer's instructions and the relevant Australian and New Zealand standards.

14 Section 24—Measuring the methane destruction efficiency of a combustion device, DE_i

For section 24 of the Determination, the methane destruction efficiency of methane in biogas (DE_i) is determined, as a fraction, using a default or measured approach in the following table:

	Default	Measured
Open flares	98% (factor of 0.98)	N/A
Enclosed flares	98% (factor of 0.98)	Duplicate compliance testing, measured every 6 months, by a NATA accredited emission stack testing company, using a method based on US EPA Method 18 or US EPA Method 3C.
Internal combustion engine	98% (factor of 0.98)	Duplicate compliance testing, measured every 6 months, by a NATA accredited emission stack testing company, using a method based on US EPA Method 18 or US EPA Method 3C; It is not measured if amount of methane combusted is calculated from amount of electricity (MWh) produced in accordance with subsection 22(3) of the Determination.
Gas boiler	98% (factor of 0.98)	Measured every 6 months if using measured efficiency by an appropriate testing company. Section 7 also applies as if the boiler were a flare.

15 Section 24—Measuring the total amount of electricity produced by combustion device. $Q_{EG,i}$

For section 24 of the Determination, the total amount of electricity produced by combustion device ($Q_{EG,i}$), in megawatt hours, over the reporting period that is:

- (a) estimated consistently with Part 6.1 of the NGER (Measurement) Determination; or
- (b) estimated by measuring only the electricity produced from the combustion of biogas produced by the project (not from the combustion of other fuel types).

16 Section 24—Measuring the electrical efficiency of the combustion device, Eff_i

For section 24 of the Determination, the electrical efficiency of the combustion device, (Eff_i) must be:

- (a) measured as a fraction, in accordance with the manufacturer’s specification in the technical manual for the equipment; or
- (b) the default value set out in subsection 2.38(2) of the NGER (Measurement) Determination.

17 Section 25—Methane Conversion Factor, MCF_n

For section 25 of the Determination, the methane conversion factor for the source material from a region in the National Inventory Report (MCF_n) must:

- (a) reflect the State or Territory where the material was sourced from; and
- (b) if the source was a dairy—use the factor applicable to ‘Anaerobic lagoon’; and
- (c) if the source was a piggery—use the factor applicable to ‘Effluent pond (Uncovered anaerobic lagoon)’.
- (d) if the source was from feedlot cattle—use the factor applicable to ‘Uncovered anaerobic lagoon (Effluent pond)’; and

- (e) if the the source was another source for which the National Inventory Report provides an equivalent factor—that factor; and
- (f) if paragraph (b) of the definition of the MCF_n applies (there is no factor in the National Inventory Report)—the factor of 0.65 is the default.

18 Determining the amount of volatile solids in material type w

Sections 25 and 32—Material diverted in project facility during the reporting period
($VS_{Div, w, n}$)

- (1) The total amount of volatile solids in material of type w that is diverted in the project facility during the reporting period, and treated using treatment method n . It is measured in tonnes of volatile solids. $VS_{Div, w, n}$ is worked out using the formula:

$VS_{Div, w, n} = C_{VS, Div, w, n} \times Q_{Div, w, n}$	Equation S1
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where:

$C_{VS, Div, w, n}$ is the volatile solids concentration in material of type w that is diverted in the project facility under treatment method n during the reporting period, as a proportion. This is based on the concentration of volatile solids in the whole sample analysed by the laboratory, including the moisture contained in the material. This value is measured at a frequency and timing that gives representative monthly measurements.

$Q_{Div, w, n}$ is the total amount of material of type w that is diverted in the project facility under treatment method n during the reporting period, in tonnes, determined in accordance with this section.

Section 26—Determining amount of volatile solids in ineligible material type w
($VS_{Inel, w}$)

- (2) The total amount of volatile solids in ineligible material of type w that enters the project facility during the reporting period, in tonnes of volatile solids, $VS_{Inel, w}$ is worked out using the formula:

$VS_{Inel, w} = C_{VS, Inel, w} \times Q_{Inel, w}$	Equation S2
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where:

$C_{VS, Inel, w}$ is the volatile solids concentration of ineligible material of type w that enters the project facility during the reporting period, as a proportion. This is based on the concentration of volatile solids in the whole sample analysed by the laboratory, including the moisture contained in the material. This value is measured at a frequency and timing that gives representative monthly measurements.

$Q_{Inel, w}$ is the total amount of ineligible material of type w that enters the project facility during the reporting period, in tonnes, determined in accordance with this section.

Sections 25, 26 and 32—Determining amount of material of type w

- (3) The parameters $Q_{Div, w, n}$ and $Q_{Inel, w}$ must be determined by:
 - (a) determining either the weight of each batch (truck, trailer, wagon load or other carrying device) of relevant material, or the volume of each batch; and
 - (b) summing the weights or volumes; and
 - (c) if volume is used—converted to tonnes based on calibrations consistent with subsection (5).
- (4) The weight or volume of each batch must be:
 - (a) measured in a way appropriate to the material; or
 - (b) for material entering project facility—as evidenced by invoices or other records.
- (5) If the volume of each batch is used:
 - (a) the volumes need to be calibrated with mass measurements for at least the first 6 months and at least once every 2 years after that;
 - (b) monthly records need to be kept of the estimated mass of material diverted; and
 - (c) if the estimated mass of material diverted exceeds the current calibration by more than 10%, the volumes need to be recalibrated by mass measurements for at least another 6 months.

Sections 25, 26 and 32—Determining volatile solids concentration

- (6) The parameters $C_{VS, Div, w, n}$ and $C_{VS, Inel, w}$ must be determined by:
 - (a) collecting representative composite samples of the relevant material, including:
 - (i) at least once each month for the first 6 months; and
 - (ii) if all measurements over the most recent 6 month period do not deviate by more than 10%—at least once every 3 months; and
 - (iii) if subparagraph (ii) does not apply—at least once each month; and
 - (b) causing any samples to be analysed for volatile solids to be:
 - (i) immediately stored in a sealed container and transported on ice (but not frozen) or a refrigerator until analysed; and
 - (ii) analysed in a laboratory in triplicate; and
 - (c) collecting sufficient sub-samples of the material to get a representative composite sample for analysis of the diverted material in accordance with:
 - (i) the *National Environmental Pig Guidelines* published by Australian Pork Limited; or
 - (ii) the *Sampling manual for environmental monitoring by intensive livestock industries* written by Mathew Redding in 2003 and published by the Queensland Government; and
 - (d) analysing those samples in accordance:
 - (i) the relevant method in the most recent *Standard Methods for the Examination of Water and Wastewater* published by the American Public Health Association; or

Note: In 2019, the relevant method was at 2540E at <https://www.standardmethods.org/>.

- (ii) an equivalent Australian standard.

19 **Section 30—fuel use attributable to operation of project facility, $Q_{F,i}$**

For section 30 of the Determination, $Q_{F,i}$ is the amount of fuel type i that is specifically attributable to the operation of the project facility during the reporting period, in tonnes, kilolitres, cubic metres, or gigajoules is:

- (a) the best estimate of the amount of fuel type i used in the operation of the project facility during the reporting period and attributable to the current operation of the project; less
- (b) an estimate of use of type i used in the operation of the project facility that would have occurred without the project during the reporting period, based on average fuel used before the project was implemented;

that:

- (c) is estimated in accordance with Division 2.2.5, 2.3.6 or 2.4.6 of the NGER (Measurement) Determination (as appropriate to the fuel type); and
- (d) is evidenced by invoices, contractual arrangements or industry metering records; and
- (e) uses a representative historical period, generally of at least 1 year, to estimate the average of fuel use before the project was implemented under paragraph (b); and
- (f) fairly attributes fuel use between the project facility and uses of the fuel outside of the project facility included in any relevant invoice, contractual arrangements or industry metering records.

20 **Section 31—the amount of purchased electricity that is specifically attributable to the operation of the project facility, Q_{PE}**

- (1) For section 31 of the Determination, the amount of purchased electricity that is specifically attributable to the operation of the project facility, Q_{PE} during the reporting period:
 - (a) is the best estimate of amount of purchased electricity used for the project based on evidence from invoices, contractual arrangements or industry metering records; and
 - (b) must fairly attribute electricity use between the project facility and uses of the electricity outside of the project facility included in any relevant invoice, contractual arrangements or industry metering records.
- (2) If Q_{PE} is measured in gigajoules, the amount of kilowatt hours must be calculated by dividing the amount of gigajoules by the conversion factor of 0.0036.

21 **Section 32—post-diversion methane conversion factor, $MCF_{Post,n}$**

For section 32 of the Determination, $MCF_{Post,n}$ the post-diversion methane conversion factor for each type of material and each treatment method is:

- (a) if composting is used—0.02; and
- (b) if stockpiling is used—0.02.

22 **Section 32—the methane-producing capacity for the volatile solids, $B_{0,Div,w}$**

For section 32 of the determination, $B_{0,Div,w}$ is the methane-producing capacity for the volatile solids of material, in cubic metres of methane per tonne of volatile solids is determined:

- (a) in accordance with subsection 32(3) of the Determination and the relevant column of Schedule 1: and

- (b) if they are to be measured—determined consistently with the requirements in section 11.

23 Section 32—nitrous oxide conversion factor, N_2O-N_{CF}

For section 32 of the Determination, N_2O-N_{CF} , the factor that converts tonnes of N_2O-N (the nitrogen component of nitrous oxide) into tonnes CO_2-e at standard conditions is 44/28 multiplied by the global warming potential of nitrous oxide in the NGER Regulations.

24 Section 32—nitrous oxide emission factor, $INOEF_{Post, n}$

For section 32 of the Determination, $INOEF_{Post, n}$, the post-diversion integrated nitrous oxide emission factor for each post-diversion treatment method is 0.00791.

25 Section 32—the amount of nitrogen in material type w , $N_{Div, w, n}$

Amount of material diverted in project facility during the reporting period ($N_{Div, w, n}$)

- (1) The total amount of nitrogen in material of type w that is diverted in the project facility during the reporting period, and treated using treatment method n . It is measured in tonnes of nitrogen. $N_{Div, w, n}$ is worked out using the formula:

$N_{Div, w, n} = C_{N, Div, w, n} \times Q_{Div, w, n}$	Equation S3
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where:

$C_{N, Div, w, n}$ is the nitrogen concentration of material of type w that is diverted in the project facility during the reporting period under treatment method n , as a proportion. This is based on the concentration of nitrogen in the whole sample analysed by the laboratory, including the moisture contained in the material. This value is measured at a frequency and timing that gives representative monthly measurements.

$Q_{Div, w, n}$ is the total amount of material of type w that is diverted in the project facility under treatment method n during the reporting period, in tonnes, determined in accordance with subsection 18(3).

Determining nitrogen concentration

- (2) The parameter $C_{N, Div, w, n}$ must be determined by:
- (a) collecting representative composite samples of the relevant material, including:
 - (i) at least once each month for the first 6 months; and
 - (ii) if all measurements over the most recent 6 month period do not deviate by more than 10%—at least once every 3 months; and
 - (iii) if subparagraph (ii) does not apply—at least once each month; and
 - (b) causing any samples to be analysed for Total Nitrogen or Total Kjeldahl Nitrogen solids to be:
 - (i) immediately stored in a sealed container and transported on ice (but not frozen) or a refrigerator until analysed; and

- (ii) analysed in a laboratory in triplicate; and
 - (iii) subtracting the background nitrogen used in the test; and
 - (c) collecting sufficient sub-samples of the material to get a representative analysis of the diverted material in accordance with:
 - (i) the *National Environmental Pig Guidelines* published by Australian Pork Limited; or
 - (ii) the *Sampling manual for environmental monitoring by intensive livestock industries* written by Mathew Redding in 2003 and published by the Queensland Government.,
 - (d) analysing those samples in accordance:
 - (i) the relevant method in the most recent *Standard Methods for the Examination of Water and Wastewater* published by the American Public Health Association; or
- Note: In 2019, the relevant method was at 2540E at <https://www.standardmethods.org/>.
- (ii) an equivalent Australian standard.
 - (e) calculating the concentration of nitrogen, in tonnes of nitrogen per tonne of material analysed.

Part 4—Recordkeeping

26 Sections 38 and 39—Record-keeping requirements

The following information is specified in relation to direct and indirect measurement:

- (a) records of any raw data and site observations relating to the animal effluent project;
- (b) all values and intermediate calculations in the calculation of the net abatement amount;
- (c) monitoring data, including data to evidence animal effluent project performance to show that any ineligible material had no significant adverse effect on the operation and performance of the treatment system;
- (d) electronic recording of values of logged primary parameters for each measurement interval, for each measurement, including the following:
 - (i) biogas flow data for each flow meter;
 - (ii) methane content of gas (% by volume) for each measurement including date, time and location of measurement, notes of non-compliance to performance specifications, remedial actions taken to correct instrument;
- (e) auditable evidence of fuel use;
- (f) auditable evidence of purchased electricity use;
- (g) auditable evidence of electricity use;
- (h) auditable evidence of the amount of electricity produced by each internal combustion engine generator used in the project;
- (i) auditable evidence of quantities of any ineligible material used (see paragraph 16(2)(c) of the Determination);
- (j) auditable calibration data relevant to the project and the calculation of the net abatement amount;
- (k) auditable evidence of any measurements taken in accordance with the Determination or this Supplement, including:
 - (i) the location and contract details of any laboratory used to undertake the measurements; and
 - (ii) the credentials of those conducting any tests or verifying the accuracy of any equipment used in those tests.
- (l) auditable evidence that the post-diversion treatment complies with the requirements of section 9.

27 Section 39—Biogas composition for methane destruction projects

The following information is specified in relation to site determination of biogas composition:

- (a) biogas analyser information if used, including the model, serial number and calibration procedures for the instrument; and
- (b) biogas analyser calibration data for each gas analyser.

28 Section 41—Monitoring equipment

The details of each instrument of the following kinds are specified, including the model, serial number for each instrument, and calibration procedures where relevant:

- (a) biogas flow meters;
- (b) electricity meters;
- (c) devices for measuring diverted material;

(d) devices for measuring volatile solids and nitrogen in material.

Part 5—Monitoring

29 Section 41—Monitoring requirements

For section 41 of the Determination, the Part specifies requirements relevant to the monitoring obligations in that section.

30 Biogas measurement error margins

The measurement of biogas pressures must be carried out using equipment that complies with the following accuracy and transmitter requirements:

- (a) pressure $<\pm 0.5\%$; and
- (b) differential pressure $<\pm 0.5\%$.

Schedule 1—Default methane-producing capacities for types of material

Note: See section 4 of this Supplement, and the definition of *default capacity* in section 5 of the Determination.

The *default capacity* for the methane-producing capacity of the volatile solids deriving from a type of material listed in the table below is as specified in the table for the relevant equation that the capacity is used:

Default methane-producing capacities for different types of material			
Item	Type of material (w)	Equations 7 and 12 default methane-producing capacity ($B_{0, Div w}$) cubic metres of methane per tonne of volatile solids ($m^3 CH_4$/tonne VS) (<i>eligible material</i>)	Equations 8 default methane-producing capacity ($B_{0, w}$) cubic metres of methane per tonne of volatile solids ($m^3 CH_4$/tonne VS) (<i>ineligible material</i>)
1	Piggery effluent, including separated solids	270	450
2	Dairy cow effluent, including separated solids	145	250
3	Feeder cattle effluent	130	220
4	Poultry manure, including litter	200	330
5	Horse dung	150	190
6	Sheep manure	150	250
7	Abattoir waste	340	980
8	Abattoir paunch	180	470
9	Blood (abattoir)	400	490
10	Sewage sludge	270	460
11	Grease trap waste	550	970
12	Sugar mill press mud	180	280
13	Glycerol	370	720
14	Food waste	290	700
15	Bakery waste	360	730
16	Cheese waste	350	730
17	Spent grains fresh (e.g. brewery, distillers)	240	330
18	Apples	281	440
19	Bananas	270	410
20	Cabbage	290	380
21	Carrot	240	420
22	Cauliflower	190	420
23	Citrus, including waste	300	730
24	Vegetable oil	420	940
25	Sugarcane	230	300
26	Lucerne	230	500
27	Clover	280	560
28	Ryegrass	390	510

Default methane-producing capacities for different types of material

Item	Type of material (w)	Equations 7 and 12 default methane-producing capacity ($B_{0, Div w}$) cubic metres of methane per tonne of volatile solids ($m^3 CH_4$/tonne VS) (<i>eligible material</i>)	Equations 8 default methane-producing capacity ($B_{0, w}$) cubic metres of methane per tonne of volatile solids ($m^3 CH_4$/tonne VS) (<i>ineligible material</i>)
29	Macroalgae (saltwater)	100	560
30	Macroalgae (freshwater)	100	230
31	Microalgae (freshwater)	180	420
32	Grass hay & silage	100	390
33	Rye, barley and corn silage	280	600
34	Forage sorghum silage	260	420
35	Triticale silage	250	610
36	Barley straw	230	320
37	Oats straw	70	320
38	Wheat straw	160	300
39	Cereal grains (barley, wheat, oats)	310	690
40	Corn grain	440	470
41	Lupin grain	310	360
42	Sorghum grain	360	370

Schedule 2—Treatment method—Solids Separation

Note: See section 8 of this Supplement.

Background

Projects that use solids separation devices manage the diverted solids aerobically to avoid further methane production. Solids separation devices operate to remove volatile solids and nitrogen contained in organic effluent.

One or more solids separation devices may be used in projects to divert volatile solids. Facilities using solids separation devices are emissions avoidance facilities. Projects can include a combination of solids separation devices (emissions avoidance) with methane capture and combustion facilities (emissions destruction).

Project facilities treating organic effluent by diversion using solids separation devices for emissions avoidance are not permitted to include ineligible material in the effluent stream – consistent with section 16 of the determination.

Requirements

Projects must use one of the various methods for separating solids from organic effluent that generally rely on a gravitational process and/or a mechanical device. These methods can be grouped according to their basic removal mechanism:

- Gravitational settling
- Perforated screens and presses
- Centrifugal separation
- Dissolved Air Flotation
- Chemical flocculation
- Combined systems

Note: The efficiency of each system depends on the flow rate of the animal effluent, its solids concentration, the shape and size distribution of the particles, and their chemical nature.

Project proponents must use the solids separation devices in a manner consistent with the manufacturer's requirements and any other regulations.

Note: The type of solids removal device and the manufacturer's specifications must be reported on in accordance with paragraph 34(3)(b) of the Determination. The determination requires that records be kept that demonstrate the device is maintained and operated in accordance with the manufacturer's requirements throughout the duration of the project (section 39 of the Determination).

Schedule 3—Process for updating the Supplement

Note: See section 2 of this Supplement.

Subsection 106(8) of the *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act) allows for Emissions Reduction Fund methods to reference factors or parameters that are contained in subsidiary material that is external to the methodology determination.

Factors in subsidiary material can be updated to ensure that methods continue to operate and calculate abatement as intended and continue to meet the offsets integrity standards in the Act. This method provision ensures that abatement estimates remain aligned into the future with Australia's international greenhouse gas reporting.

Section 6 of the Determination requires that the version of the Supplement that is in force at the end of the reporting period must be used for all calculations for the whole reporting period.

Prior to a decision to make any updates to the Supplement to the Determination, the Department will consider all of the following:

- The robustness of the science and weight of supporting evidence for the change;
- The impact (if any) of changing or not changing the material on the compliance of the method with the offsets integrity standards;
- Responses from consultation following a review period for the proposed change;
- The potential impact on abatement estimates and regulatory burden for projects and overall scheme integrity should the update be made;
- An independent technical review of the proposed update, if appropriate;
- Any views on the update expressed by the Clean Energy Regulator;
- The ability of the National Inventory to accommodate the proposed change.

As part of the Emissions Reduction Assurance Committee's regular method reviews, consideration will be given to any proposed updates to the Supplement assessed by the Department as appropriate and provided to the Committee for advice. Any advice from the Emissions Reduction Assurance Committee will be published on the Department's website. These reviews are generally conducted every 4 years.

Updates would only be progressed outside of the review process if:

- they are of a minor nature (such as corrections to errors without significant regulatory impact); or
- they are needed to address material issues for the integrity of the method such that it would be inappropriate to wait until the next review.

Separate advice from the Emissions Reduction Assurance Committee would be sought on any material updates progressed outside of the review process.