Australian Government
Clean Energy Regulator

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

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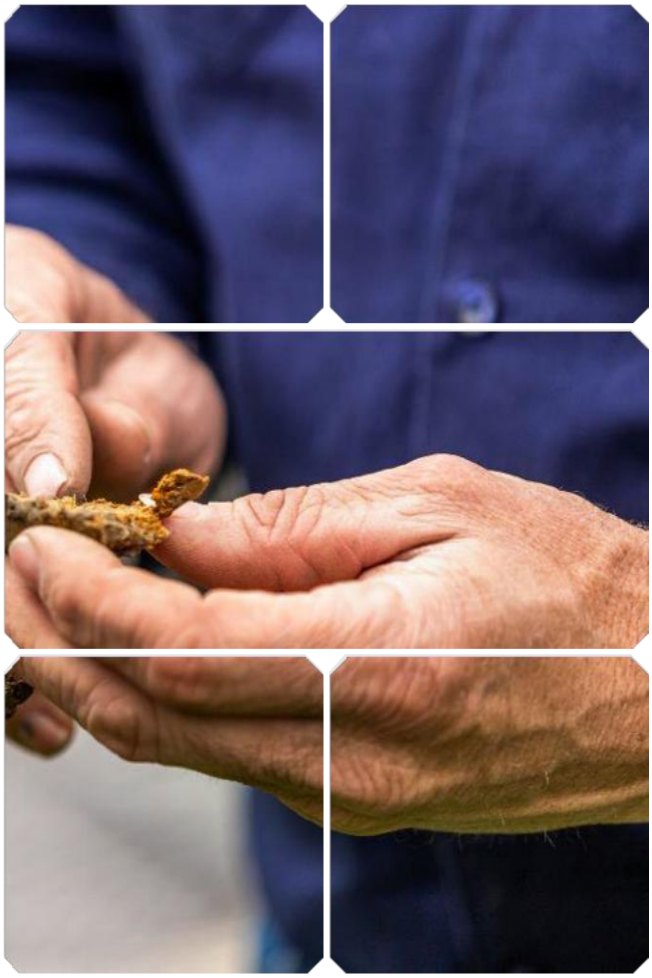

CLEAN ENERGY REGULATOR

Disclaimer

This document has been developed to support the Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019) (the Determination) and is incorporated by various provisions of the Determination. This document does not replace relevant legislative provisions or other laws. All users are encouraged to read this document in conjunction with relevant legislation, including the Determination, referenced throughout this document. Where there are any inconsistencies, please be aware that the legislative provisions will take precedence.

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Contents

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

This Supplement comes into effect on the commencement of the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019*.

Note 1: The *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019* commenced on 7 January 2020.

Note 2: Section 6 of the Determination requires that the version of this Supplement that is in force at the end of the reporting period for a project must be used for all calculations for the whole reporting period for the project. (This is authorised by subsection 106(8) of the *Carbon Credits (Carbon Farming Initiative) Act 2011,* which provides that an Australian Carbon Credit Unit Scheme methodology determination may make provision in relation to a matter by applying, adopting or incorporating a matter contained in an instrument as in force from time to time.)

3 Definitions

(1) In this Supplement:

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

National Inventory Report 2019 means the report of that name produced by Australia in fulfilment of its obligations under the Climate Change Convention and the Kyoto Protocol.

Note: In 2022, the National Inventory Report 2019 could be accessed from http://www.industry.gov.au.

(2) Words and expressions in this Supplement have the same meaning as they have in:

(a) the *Carbon Credits (Carbon Farming Initiative) Act 2011*; or

(b) the Determination.

4 Section 5—Definition of 'default capacity'

(1) For the definition of 'default capacity' in section 5 of the Determination, the default capacity of the methane-producing capacities of listed types of material is specified in Schedule 1.

(2) Two default capacity values are provided for each listed type of material, one to be used in equations 7 and 12, and another to be used in equation 8. (Equations 7, 12 and 8 are set out in sections 25, 32 and 26 of the Determination, respectively.)

5 Section 5—Definition of 'listed type'

(1) For the definition of 'listed type' in section 5 of 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 in accordance with clause 10.

Part 2—Matters referred to in Part 3 of the Determination (project requirements)

6 Section 9C—Flare operation for methane destruction projects

(1) This clause sets out the requirements for determining whether a flaring system used in a project is operational for the purposes of:

(a) paragraph 9C(3)(b) of the Determination; and

(b) determining the destruction efficiency DE_i of the flaring system (as required by subsection 24(2) of the Determination).

(2) Subject to subclause (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 that 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.

7 Section 9D—Emissions avoidance treatment facility—solids separation method

For paragraph 9D(a) of the Determination, the requirements for the use of a solids separation method of diversion are as follows:

(a) a project must use one of the various methods for separating solids from organic effluent that generally rely on a gravitational processor, a mechanical device, or both;

(b) these methods can be grouped according to their basic removal mechanism, as follows:

(i) gravitational settling;

(ii) perforated screens and presses;

(iii) centrifugal separation;

(iv) dissolved air flotation;

(v) chemical flocculation;

(vi) 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.

(c) the solids separation devices must be used in a manner that is consistent with the manufacturer’s requirements and any other regulations.

Note 1: The Determination requires that records be kept that demonstrate that any solids separation device is maintained and operated in accordance with the manufacturer’s requirements throughout the duration of the project (see section 39C of the Determination).

Note 2: 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.

Note 3: 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).

Note 4: Project treatment facilities treating organic effluent by diversion using solids separation devices for emissions avoidance are not permitted to include ineligible material in the effluent stream (see section 16 of the Determination).

8 Section 9D—Emissions avoidance treatment facility—post-diversion treatment

For paragraph 9D(b) of the Determination, the post-diversion treatment must:

(a) take into account industry best practice to ensure that the treatment facility complies with subsection 8A(5) 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.

9 Section 15—Evidence that 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 or dairies is specified.

(2) For paragraph 15(2)(b) of the Determination, evidence that satisfies the Regulator that organic effluent specified by subclause (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 that would have treated the material

Part 3—Matters referred to in Part 4 of the Determination (net abatement amount)

Division 1—Measuring methane-producing capacity

10 Sections 16, 25 and 27—Measuring methane-producing capacity

Note: This clause refers to the measurement of the methane-producing capacity of a material. For the default methane-producing capacity of material of type *w* for section 27 of the Determination, see clause 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 subclause (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 3 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 2022, 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

(c) 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.

Division 2—Working out gross abatement amount

11 Section 24—Measuring the quantity of biogas from a project treatment facility sent to a combustion device or biogas upgrading system, $Q_{biogas\ h,\ i}$

(1) For subsection 24(2) of the Determination, the total volume of biogas from project treatment facility *h* sent to combustion device *i* or biogas upgrading system *i* during a reporting period ($Q_{biogas\ h,\ i}$) must be measured as follows:

(a) the biogas flow must be measured:

(i) as close to the delivery location of the gaseous fuel to the combustion device or biogas upgrading system as is safely possible; and

(ii) at a point at which the biogas flow is entirely biogas from project treatment facility *h*; and

(iii) using a continuous monitoring system;

(b) the biogas flow must be recorded in cubic metres (m^3).

(2) Biogas flow must be measured using equipment that:

(a) is rated for use with raw biogas that may contain corrosive ingredients such as hydrogen sulphide, entrained aerosols and fine particulate matter; and

(b) is rated for use at the expected flow rates and pressures for the combustion devices or biogas upgrading system being used; and

(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*.

12 Section 24—Measuring the proportion of methane in biogas, $W_{BG,\ CH4}$

(1) For subsection 24(2) of the Determination, the proportion of methane in biogas ($WW_{BBBB,CCCC_{44}}$) must be:

(a) a default value calculated under subclause (2); or

(b) measured under subclause (3).

(2) The default values for the proportion of methane in biogas ($WW_{BBBB,CCCC_{44}}$) 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 ($WW_{BBBB,CCCC_{44}}$) 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 paragraph (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 paragraphs (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.

13 Section 24—Measuring the methane destruction efficiency of a combustion device or biogas upgrading system, *DE_i*

(1) For subsection 24(2) of the Determination, the methane destruction efficiency of methane in biogas (***DE_i***) is determined, as a fraction, using a default or measured approach specified 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 the amount of methane combusted is calculated from the amount of electricity (MWh) produced in accordance with subsection 24(4) of the Determination.
Gas boiler	98% (factor of 0.98)	Measured every 6 months if using measured efficiency by an appropriate testing company. Clause 6 also applies as if the boiler were a flare.
Biogas upgrading system	98% (factor of 0.98)	N/A

(2) In this clause:

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

US EPA Method 3C means the standard entitled “Method 3C—Determination of carbon dioxide, methane, nitrogen, and oxygen from stationary sources using a thermal conductivity detector” issued by the United States Environmental Protection Agency, as in force on 2 August 2017.

US EPA Method 18 means the standard entitled “Method 18—Measurement of gaseous organic compound emissions by gas chromatography” issued by the United States Environmental Protection Agency, as in force on 1 October 2022.

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

For subsection 24(4) of the Determination, the total amount of electricity produced by combustion device ($Q_{EG, i}$), in megawatt hours, over the reporting period must be either:

(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).

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

For subsection 24(4) 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.

16 Section 24A—Measuring the proportion of methane in biomethane, $W_{BM, CH4, k}$

For subsection 24A of the Determination, the proportion of methane in biomethane sent out by biogas upgrading system k ($W_{BM, CH4, k}$), expressed as a fraction, must be measured:

(a) using an inline gas analyser that analyses gas composition at a point after biogas upgrading is complete; and

(b) to an accuracy of +/ 3% absolute; and

(c) in accordance with the instrument manufacturer’s instructions and the relevant Australian and New Zealand standards; and

(d) must be paired to measurements of the volume of biomethane sent out by biogas upgrading system k ($Q_{BM, k}$) for the same measurement interval.

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)’; and

(d) if the source was from feedlot cattle—use the factor applicable to ‘Uncovered anaerobic lagoon (Effluent pond)’; and

(e) if 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 '***MCF_n***' in section 25 of the Determination applies (that is, there is no factor in the National Inventory Report)—the factor of 0.65 is the default.

18 Sections 25, 26 and 32—Determining the amount of volatile solids in material type *w*

Material diverted in project treatment facility during the reporting period ($VS_{Div, w, n}$)

(1) For section 25 and subsection 32(1) of the Determination, the amount of volatile solids from material of type w, in tonnes of volatile solids, that is diverted in the project treatment facility during the reporting period and treated using treatment method n, (***$VS_{Div, w, n}$***) is worked out using the formula:

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

where:

$C_{VS,Div, w, n}$ is the volatile solids concentration in material of type *w* that is diverted in the project treatment 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 treatment facility under treatment method *n* during the reporting period, in tonnes, determined in accordance with this clause.

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

(2) For section 26 of the Determination, the total amount of volatile solids in ineligible material of type *w* that enters the project treatment 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

where:

$C_{VS, Inel, w}$ is the volatile solids concentration of ineligible material of type *w* that enters the project treatment 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 treatment facility during the reporting period, in tonnes, determined in accordance with this clause.

Determining amount of material of type w

(3) For subclauses (1) and (2), the parameters $\boldsymbol{Q_{Div, w, n}}$ and $\boldsymbol{Q_{Inel, w}}$ 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—converting the amount to tonnes based on calibrations consistent with subclause (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 the project treatment 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; and

(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.

Determining volatile solids concentration

(6) For subclauses (1) and (2), the parameters $\boldsymbol{C_{VS,Div, w, n}}$ and $\boldsymbol{C_{VS, Inel, w}}$ 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:

a. in the case of an indoor piggery—the *National Environmental Guidelines for Indoor Piggeries* published by Australian Pork Limited in May 2018; or

(ii) in the case of an outdoor piggery—the *National Environmental Guidelines for Rotational Outdoor Piggeries* published by Australian Pork Limited in 2013; or

(iii) in any other case—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 with:

(i) the relevant method in the relevant *Standard Methods for the Examination of Water and Wastewater* published by the American Public Health Association in 2017; or

Note: In 2022, the relevant method was at 2540E at https://www.standardmethods.org/.

(ii) an equivalent Australian standard.

Division 3—Working out project emissions

19 Section 30—Fuel use attributable to operation of project treatment facility, $Q_{F\ conversion,\ i}$

For subsection 30(1) of the Determination, $Q_{F\ conversion,\ i}$, is the amount of fuel type *i* that is specifically attributable to the operation of the project treatment 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 treatment 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 treatment 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 treatment facility and uses of the fuel outside of the project treatment facility included in any relevant invoice, contractual arrangements or industry metering records.

20 Section 31—Amount of purchased electricity that is specifically attributable to the operation of the project treatment facility, $Q_{PE,\ conversion}$

(1) For section 31 of the Determination, the amount of purchased electricity that is specifically attributable to the operation of the project treatment facility, ($Q_{PE,\_conversion}$) during the reporting period:

(a) is the best estimate of the 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 treatment facility and uses of the electricity outside of the project treatment facility included in any relevant invoice, contractual arrangements or industry metering records.

(2) If $Q_{PE,\ conversion}$ 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 subsection 32(1) 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—Methane-producing capacity for the volatile solids, $B_{oDiv,w}$

For subsection 32(1) of the Determination, $B_{o,Div,w}$, 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 clause 10.

23 Section 32—Nitrous oxide conversion factor, $N_2O\text{-}N_{CF}$

For subsection 32(2) of the Determination, $N_2O\text{-}N_{CF}$, the factor that converts tonnes of $N_2O\text{-}N$ (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 subsection 32(2) 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—Amount of nitrogen in material type *w*, $N_{Div,\,w,\,n}$

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

(1) For subsection 32(2) of the Determination, the total amount of nitrogen in material of type *w* that is diverted in the project treatment 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

where:

$C_{N,Div,\,w,\,n}$ is the nitrogen concentration of material of type *w* that is diverted in the project treatment 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 treatment facility under treatment method *n* during the reporting period, in tonnes, determined in accordance with subclause 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

(c) when testing for Total Nitrogen or Total Kjeldahl Nitrogen solids, by subtracting the background nitrogen used in the test; and

(d) collecting sufficient sub-samples of the material to get a representative analysis of the diverted material in accordance with:

a. in the case of an indoor piggery—the *National Environmental Guidelines for Indoor Piggeries* published by Australian Pork Limited in 2018; or

(ii) in the case of an outdoor piggery—the *National Environmental Guidelines for Rotational Outdoor Piggeries* published by Australian Pork Limited in 2013; or

(iii) in any other case—the *Sampling manual for environmental monitoring by intensive livestock industries* written by Mathew Redding in 2003 and published by the Queensland Government; and

(e) analysing those samples in accordance with:

(i) the relevant method in the most recent *Standard Methods for the Examination of Water and Wastewater* published by the American Public Health Association in 2017; or

Note: In 2022, the relevant method was at 2540E at https://www.standardmethods.org/.

(ii) an equivalent Australian standard; and

(f) calculating the concentration of nitrogen, in tonnes of nitrogen per tonne of material analysed.

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

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

For 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) *(eligible material)*	Equations 8 default methane-producing capacity ($B_{0,\ w}$) cubic metres of methane per tonne of volatile solids (m^3 CH_4/tonne VS) *(ineligible material)*
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

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) *(eligible material)*	**Equations 8 default methane-producing capacity ($B_{0,\ w}$)** cubic metres of methane per tonne of volatile solids (m^3 CH_4/tonne VS) *(ineligible material)*
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
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

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) *(eligible material)*	**Equations 8 default methane-producing capacity ($B_{0,\ w}$)** cubic metres of methane per tonne of volatile solids (m^3 CH_4/tonne VS) *(ineligible material)*
40	Corn grain	440	470
41	Lupin grain	310	360
42	Sorghum grain	360	370