National Greenhouse and Energy Reporting (Measurement) Amendment Determination 2013 (No. 1)

I, Greg Combet AM, Minister for Climate Change, Industry and Innovation, make the following determination under sections 7B and 10 of the *National Greenhouse and Energy Reporting Act 2007*.

Dated: 25 June 2013

Greg Combet AM
Minister for Climate Change, Industry and Innovation

Federal Register of Legislative Instruments F2013L01191

Contents

1 Name of determination

This determination may be cited as the *National Greenhouse and Energy Reporting (Measurement) Amendment Determination 2013 (No. 1)*.

2 Commencement

This determination commences on 1 July 2013.

3 Authority

This determination is made under sections 7B and 10 of the *National Greenhouse and Energy Reporting Act 2007*.

4 Schedule(s)

Each instrument that is specified in a Schedule to this instrument is amended or repealed as set out in the applicable items in the Schedule concerned, and any other item in a Schedule to this instrument has effect according to its terms.

Schedule 1—Amendments

National Greenhouse and Energy Reporting (Measurement) Determination 2008

1 Subsection 1.3(1)

Omit "section 7B and subsection 10 (3)", substitute "sections 7B and 10".

2 Paragraph 1.3(1)(d)

Omit "natural gas", substitute "designated fuel".

3 Subsection 1.3(2)

Omit "natural gas", substitute "designated fuel".

4 Subsection 1.3(2) (note 3)

Repeal the note, substitute:

Note 3: ***Designated fuel*** has the meaning given by the *Clean Energy Act 2011*.

5 Subsection 1.4(3)

Omit "natural gas", substitute "designated fuel".

6 At the end of section 1.4

Add:

(4) For potential greenhouse gas emissions embodied in an amount of gaseous designated fuel:
  (a) the default method set out in section 1.10JA is based on national average estimates; and
  (b) the prescribed alternative method set out in Subdivision 1.1B.2.2 uses Australian or equivalent standards for analysis.

(5) For potential greenhouse gas emissions embodied in an amount of liquid designated fuel:
  (a) the default method set out in section 1.10KA is based on national average estimates; and
  (b) the prescribed alternative method set out in Subdivision 1.1C.2.2 uses Australian or equivalent standards for analysis.

7 Section 1.8

Insert:

active gas collection means a system of wells and pipes that collect landfill gas through the use of vacuums or pumps.

alternative waste treatment activity means an activity that:
  (a) accepts and processes mixed waste using:
    (i) mechanical processing; and

(ii) biological or thermal processing; and

(b) extracts recyclable materials from the mixed waste.

alternative waste treatment residue means the material that remains after waste has been processed and organic rich material has been removed by physical screening or sorting by an alternative waste treatment activity that produces compost, soil conditioners or mulch in accordance with:

(a) State or Territory legislation; or

(b) Australian Standard AS 4454:2012.

basin means a geological basin named in the *Australian Geological Provinces Database*.

Note: The *Australian Geological Provinces Database* is available at www.ga.gov.au.

designated fuel has the same meaning as in the *Clean Energy Act 2011*.

enclosed composting activity means composting that takes place within a building, container or vessel from which there is no leakage of emissions.

8 Section 1.8 (definition of *fugitive emissions*)

Repeal the definition, substitute:

fugitive emissions has the meaning given by the *Clean Energy Regulations 2011*.

9 Section 1.8

Insert:

gaseous designated fuel means liquefied natural gas.

10 Section 1.8 (after the definition of *Global Warming Potential)*

Insert:

Note: It is intended that the Global Warming Potentials will be updated from 1 July 2017 to align with those published by the Intergovernmental Panel on Climate Change in *The Physical Science Basis (Cambridge, UK: Cambridge University Press, 2007)*.

11 Section 1.8

Insert:

GST group has the same meaning as in the *Fuel Tax Act 2006*.

GST joint venture has the same meaning as in the *Fuel Tax Act 2006*.

inert waste means waste materials that contain no degradable organic carbon and includes the following waste:

(a) concrete;

(b) metal;

(c) plastic;

(d) glass;

(e) asbestos concrete;

(f) soil.

invoice equivalent means a document (including an electronic document) or series of documents that are intended to be used as evidence of natural gas supply (for example, for commercial or taxation purposes) and from which the following information can be ascertained:

(a) the identity of the natural gas supplier;
(b) the identity of the recipient of natural gas;
(c) the amount of natural gas supplied;
(d) the period to which the supply relates;
(e) the date the document was issued.

Example: Where natural gas is supplied directly from a natural gas transmission pipeline, volume reports provided by the pipeline operator or wholesale supplier will be invoice equivalents.

liquefied natural gas has the same meaning as in the Regulations.

liquefied petroleum gas has the same meaning as in the Regulations.

liquid designated fuel means:

(a) liquefied petroleum gas; and
(b) specified taxable fuel.

12 Section 1.8 (definition of *method*)

Repeal the definition, substitute:

method means a method specified in this determination for estimating:

(a) emissions released from the operation of a facility in relation to a source; or
(b) the potential emissions embodied in an amount of designated fuel.

13 Section 1.8

Insert:

netted out number has:

(a) in relation to liquefied petroleum gas and liquefied natural gas imported into Australia, the same meaning as in section 36B of the *Clean Energy Act 2011* and any regulations made under that section; and
(b) in relation to liquefied petroleum gas and liquefied natural gas manufactured or produced in Australia, the same meaning as in section 36C of the *Clean Energy Act 2011* and any regulations made under that section; and
(c) in relation to liquefied petroleum gas and liquefied natural gas supplied to a person who quotes an OTN, the same meaning as in section 36D of the *Clean Energy Act 2011* and any regulations made under that section.

Opt-in Scheme has the same meaning as in the *Clean Energy Act 2011*.

OTN has the same meaning as in the *Clean Energy Act 2011*.

phytocap means an evapotranspiration landfill capping system that makes use of soil and vegetation to store and release surface water.

point of liability means:

(a) for liquefied natural gas (***LNG***) or liquefied petroleum gas (***LPG***) that was produced in or imported into Australia—the point at which the LNG or LPG is entered for home consumption; or

(b) for LNG or LPG that was supplied in association with an OTN quotation or misuse of an OTN quotation—the point at which the LNG or LPG is supplied; or

(c) for LNG or LPG that is attributable to a netted out number, but not an OTN quotation—the point at which the LNG or LPG is used; or

(d) for acquisition, importation or manufacture of specified taxable fuel by a participant in the Opt-in Scheme:

(i) for fuel that is used by the participant that has been entered for home consumption—the point at which the fuel is entered for home consumption; or

(ii) if subparagraph (i) does not apply—the point at which the fuel is acquired.

14 Section 1.8 (definition of *scope 1 emissions*)

Repeal the definition, substitute:

scope 1 emissions has the same meaning as in the Regulations.

15 Section 1.8 (definition of *scope 2 emissions*)

Repeal the definition (including the note), substitute:

scope 2 emissions has the same meaning as in the Regulations.

16 Section 1.8

Insert:

separate instance of a source has the meaning given by section 1.9A.

separate occurrence of a source has the meaning given by section 1.9B.

shredder flock means the residual waste generated from the process of scrap metal processing that ends up in landfill.

specified taxable fuel has the meaning given by regulation 3.30 of the *Clean Energy Regulations 2011*.

well completion means the period that:

(a) begins on the initial gas flow in the well; and

(b) ends on whichever of the following occurs first:

(i) well shut in; or

(ii) continuous gas flow from the well to a flow line or a storage vessel for collection.

well workover means the period that:

(a) begins on the initial gas flow in the well that follows remedial operations to increase the well's production; and

(b) ends on whichever of the following occurs first:

(i) well shut in; or

(ii) continuous gas flow from the well to a flow line or a storage vessel for collection.

17 After section 1.9

Insert:

1.9A Meaning of *separate instance of a source*

If 2 or more different activities of a facility have the same source of emissions, each activity is taken to be a separate instance of the source if the activity is performed by a class of equipment different from that used by another activity.

Example: The combustion of liquefied petroleum gas in the engines of distribution vehicles of the facility operator and the combustion of liquid petroleum fuel in lawn mowers at the facility, although the activities have the same source of emissions, are taken to be a separate instance of the source as the activities are different and the class of equipment used to perform the activities are different.

1.9B Meaning of *separate occurrence of a source*

(1) If 2 or more things at a facility have the same source of emissions, each thing may be treated as a separate occurrence of the source.

Example: The combustion of unprocessed natural gas in 2 or more gas flares at a facility may be treated as a separate occurrence of the source (natural gas production or processing—flaring).

(2) If a thing at a facility uses 2 or more energy types, each energy type may be treated as a separate occurrence of the source.

Example: The combustion of diesel and petrol in a vehicle at a facility may be treated as a separate occurrence of the source (fuel combustion).

18 At the end of Part 1.1A of Chapter 1

Add:

Division 1.1A.3—Measuring amounts of natural gas supplied

1.10G Measuring natural gas supplied

(1) This section sets out how ***Q*** must be determined for sections 1.10B and 1.10C.

(2) This section applies in relation to reports under the Act relating to a financial year beginning on or after 1 July 2013.

(3) ***Q*** must be determined as a sum of amounts of natural gas supplied where each amount is evidenced using:

(a) one of, or a combination of, the primary and secondary criteria set out in subsections (4) and (5); or

(b) for an amount of natural gas supplied that cannot be evidenced using those criteria—industry practice.

(4) For the purposes of subsection (3), the ***primary criterion*** consists of one of, or a combination of, the following:

(a) data resulting from measurements of amounts that comply with the following:
  (i) the amount of natural gas is measured using volumetric measurement in accordance with sections 2.32 and 2.33;
  (ii) the amount of natural gas is measured using equipment that complies with the requirements mentioned in section 2.34;
  (iii) the measurement is carried out using gas measuring equipment that is in the appropriate category specified in the column headed "Gas measuring equipment category" of the table in subsection 2.31(4), read as if a reference in that table to gas combusted were a reference to gas supplied; and
  (iv) the measurement is carried out using gas measuring equipment that complies with the transmitter and accuracy requirements specified, for the item, in the column headed "Transmitter and accuracy requirements (% of range)" of the table;
(b) metre data that has been, or will be, used as the basis for commercial transactions between parties to a natural gas supply transaction;
(c) reports provided by the relevant market operator, including the Australian Energy Market Operator or the Retail Energy Market Company Limited, as applicable;
(d) invoices or invoice equivalents issued by the natural gas supplier or recipient of natural gas.

(5) For the purposes of subsection (3), the ***secondary criterion*** consists of data extracted from the billing system of a natural gas supplier that is or will be used as a measure of supply in financial reports prepared for the purposes of compliance with the *Corporations Act 2001*.

(6) When ascertaining an interim emissions number for the purposes of subsection 126(7) of the *Clean Energy Act 2011*, information available on 1 April immediately before the end of the eligible financial year must be used. Information available after 1 April of that year may also be used.

(7) When ascertaining a provisional emissions number for the purposes of Division 3 of Part 3 of the *Clean Energy Act 2011*, information available on 1 July immediately following the end of the eligible financial year must be used. Information available after 1 July of that year may also be used.

(8) If the information used to measure a supply contains information relating to a supply in more than one eligible financial year, the amount of natural gas supplied in each year must be apportioned between those years in accordance with industry practice.

Division 1.1A.4—Adjustment to a provisional emissions number

1.10H Adjustment to a provisional emissions number

(1) This section sets out how to increase or reduce, as the case may be, the provisional emissions number for an eligible financial year for the purposes of subsections 10(6) and 10(8) of the Act.

(2) This section applies in relation to reports under the Act relating to an eligible financial year beginning on or after 1 July 2014.

(3) The provisional emissions number is taken to be:

$$PEN + PEN_{Adjustment}$$

where:

PEN is the provisional emissions number for the eligible financial year that arises under Division 3 of Part 3 of the *Clean Energy Act 2011* (before any adjustment under this section).

$\boldsymbol{PEN_{Adjustment}}$ is the number ascertained in accordance with subsection (4), which may be positive or negative.

(4) $\boldsymbol{PEN_{Adjustment}}$ is equal to:

$$PEN_{Revised} - PEN_{Reported} + PEN_{Adjustment\ PFY}$$

where:

$\boldsymbol{PEN_{Adjustment\ PFY}}$ is any adjustment under this section that was made in relation to the eligible financial year before the previous eligible financial year (and so was included in $\boldsymbol{PEN_{Reported}}$).

$\boldsymbol{PEN_{Reported}}$ is the provisional emissions number for an amount of natural gas supplied by a person as reported for the previous eligible financial year in accordance with section 22A of the Act.

$\boldsymbol{PEN_{Revised}}$ is the provisional emissions number a natural gas supplier would have had for the previous eligible financial year for the purposes of Division 3 of Part 3 of the *Clean Energy Act 2011*, if it had been calculated as follows:

(a) the amount of gas supplied is calculated using evidence that:
  (i) meets the primary criterion in subsection 1.10G(4); and
  (ii) was available on 1 July in the year following the eligible financial year (the current year) or became available after that date;
(b) where it is known that the evidence includes gas that was not in fact supplied, so that it is necessary to reduce the amount so calculated to reflect this—the amount is reduced in accordance with industry practice.

(5) A provisional emissions number cannot be reduced below zero.

19 After Part 1.1A of Chapter 1

Insert:

Part 1.1B—Potential greenhouse gas emissions embodied in an amount of gaseous designated fuel

Division 1.1B.1—Preliminary

1.10J Purpose of Part

This Part provides for:

(a) measuring potential greenhouse gas emissions embodied in an amount of gaseous designated fuel in accordance with the default method set out in section 1.10JA; and

(b) ascertaining potential greenhouse gas emissions embodied in an amount of gaseous designated fuel in accordance with the prescribed alternative method set out in Subdivision 1.1B.2.2.

Division 1.1B.2—Available methods

Subdivision 1.1B.2.1—Default method—gaseous designated fuel

1.10JA Default method

(1) For subsection 7B(2) of the Act, the amount of greenhouse gas that would be released into the atmosphere as a result of the combustion of an amount of gaseous designated fuel is determined to be the amount that results from using the following formula:

$$E_i = Q_i \times A_i$$

where:

A ***i*** is the value specified for subsection 7B(2) of the Act for gaseous designated fuel type (***i***), worked out using the formula in subsection (2).

E ***i*** is the amount of greenhouse gas that would be released into the atmosphere as a result of the combustion of each gaseous designated fuel type (***i***), measured in $CO_{2\text{-}e}$ tonnes.

Q ***i*** is the amount of gaseous designated fuel type (***i***), measured in cubic metres corrected to standard conditions or gigajoules, estimated in accordance with Division 1.1B.3.

(2) For subsection (1), ***A*** ***i*** is worked out using the following formula:

$$\frac{\left(EC_i \times EF_{iCO_2ox,ec}\right) + \left(EC_i \times EF_{iCH_4}\right) + \left(EC_i \times EF_{iN_2O}\right)}{1\,000}$$

where:

EC ***i*** is the energy content factor for gaseous designated fuel type (***i***) mentioned in Part 2 of Schedule 1.

$\boldsymbol{EF_{iCH_4}}$ is the emission factor for CH_4 mentioned for the gaseous designated fuel type (***i***) in Part 2 of Schedule 1.

$\boldsymbol{EF_{iCO_2ox,ec}}$ is the emission factor for CO_2 mentioned for the gaseous designated fuel type (***i***) in Part 2 of Schedule 1.

$\boldsymbol{EF_{iN_2O}}$ is the emission factor for N_2O mentioned for the gaseous designated fuel type (***i***) in Part 2 of Schedule 1.

Subdivision 1.1B.2.2—Prescribed alternative method—gaseous designated fuel

1.10JB Prescribed alternative method

(1) For subsections 7B(3) and 7B(4) of the Act, this Subdivision specifies the prescribed alternative method for ascertaining the potential greenhouse gas emissions embodied in an amount of gaseous designated fuel.

(2) For subsection (1), the potential greenhouse gas emissions embodied in an amount of gaseous designated fuel is worked out using the following formula:

$$E_i = \frac{Q_i \times EC_i \times \left(EF_{iCH_4} + EF_{iN_2O} + EF_{iCO_2ox,ec} \right)}{1000}$$

where:

E*$_i$** is the potential greenhouse gas emissions embodied in an amount of gaseous designated fuel type (i***), measured in CO_2-e tonnes.

EC*$_i$** is the energy content factor for gaseous designated fuel type (i***), which:

(a) is mentioned for the gaseous designated fuel in Part 2 of Schedule 1; or

(b) is estimated by sampling and analysing samples in accordance with sections 1.10JC to 1.10JF.

EF*$_{iCH_4}$** is the emission factor for CH_4 mentioned for the gaseous designated fuel type (i***) in Part 2 of Schedule 1.

EF*$_{iCO_2ox,ec}$** is the carbon dioxide emission factor for gaseous designated fuel type (i***) measures in kiolgrams CO_2-e per gigajoule as worked out under subsection (3).

EF*$_{iN_2O}$** is the emission factor for N_2O mentioned for the gaseous designated fuel type (i***) in Part 2 of Schedule 1.

Q*$_i$** is the quantity of gaseous designated fuel type (i***) estimated in accordance with Division 1.1B.3.

(3) For subsection (2), the factor ***EF*$_{iCO_2ox,ec}$** is worked out as follows:

Method statement

Step 1. Estimate ***EF*$_{iCO_2ox,kg}$** using the formula:

$$EF_{iCO_2ox,kg} = \sum_y \left[\left(\frac{mol_y\% \times \left(\frac{mw_y}{V} \times 100 \right)}{d_{y,\,total}} \right) \times \left(\frac{44.010 \times f_y \times OF_g}{mw_y \times 100} \right) \right]$$

where:

Σ_y is sum for all component gas types.

$d_{y,\,total}$ is worked out in accordance with subsection (4).

$EF_{iCO_2ox,kg}$ is the carbon dioxide emission factor for the gaseous designated fuel type (***i***) incorporating the effects of a default oxidation factor expressed as kilograms of carbon dioxide per kilogram of gaseous designated fuel type (***i***).

f_y is, for each component gas type (***y***) mentioned in the table in subsection (5), the number of carbon atoms in a molecule of the component gas type (***y***).

$mol_y\%$ is, for each component gas type (***y***), the gas type's share of:

(a) one mole of gaseous designated fuel type (***i***), expressed as a percentage; or

(b) the total volume of gaseous designated fuel type (***i***) supplied to the person, expressed as a percentage.

mw_y is, for each component gas type (***y***), the molecular weight of the component gas type (***y***) measured in kilograms per kilomole.

OF_g is the oxidation factor 0.995.

V is the volume of 1 kilomole of the gas at standard conditions, which is 23.6444 cubic metres.

Step 2. Work out $EF_{iCO_2ox,ec}$ using the formula:

$$EF_{iCO_2ox,ec} = EF_{iCO_2ox,kg} \div \left(\frac{EC_i}{C_i} \right)$$

where:

C_i is the density of the gaseous designated fuel type (***i***) expressed in kilograms of fuel per cubic metre, analysed in accordance with a standard mentioned in subsection 1.10JD.

EC**$_i$* is the energy content factor for gaseous designated fuel type (i***) as:

(a) mentioned in Part 2 of Schedule 1; or

(b) estimated by sampling and analysing samples in accordance with sections 1.10JC to 1.10JF.

EF**$_{iCO_2ox,kg}$* is the carbon dioxide emission factor for gaseous designated fuel type (i***) worked out under step 1.

(4) For subsection (3), the factor ***d**$_{y,\ total}$* is worked out using the following formula:

$$d_{y,\ total} = \sum_{y} mol_{y}\% \times \left(\frac{mw_{y}}{V} \right)$$

where:

***Σ**$_y$* is sum of all component gas types.

mol**$_y$**% is, for each component gas type (***y***), the gas type's share of:

(a) one mole of gaseous designated fuel type (***i***), expressed as a percentage; or

(b) the total volume of gaseous designated fuel type (***i***) supplied to the person, expressed as a percentage.

mw**$_y$* is, for each component gas type (y***), the molecular weight of the component gas type (***y***) measured in kilograms per kilomole.

V is the volume of 1 kilomole of the gas at standard conditions, which is 23.6444 cubic metres.

(5) For subsection (3), the molecular weight and number of carbon atoms in a molecule of each component gas type (***y***) mentioned in column 1 of an item in the following table is set out in columns 2 and 3, respectively, for the item.

Molecular weight and number of carbon atoms of each component gas type (*y*)

Item	Column 1 Component gas type (y)	Column 2 Molecular Weight (kg/kmole)	Column 3 Number of carbon atoms in component molecules
1	Argon	39.948	0
2	Butane	58.123	4
3	Carbon dioxide	44.010	1
4	Carbon monoxide	28.016	1
5	Ethane	30.070	2
6	Hydrogen	2.016	0
7	Hydrogen sulphide	34.082	0
8	Methane	16.043	1

Molecular weight and number of carbon atoms of each component gas type (*y*)			
Item	**Column 1** **Component gas type (y)**	**Column 2** **Molecular Weight (kg/kmole)**	**Column 3** **Number of carbon atoms in component molecules**
9	Nitrogen	28.013	0
10	Oxygen	31.999	0
11	Pentane	72.150	5
12	Propane	44.097	3
13	Water	18.015	0

1.10JC General requirements for sampling gaseous designated fuels—prescribed alternative method

(1) A sample of a gaseous designated fuel must be derived from a composite of amounts of the gaseous designated fuel.

(2) The samples must be collected on enough occasions to produce a representative sample.

(3) The samples must be free of bias so that any estimates are neither over nor under estimates of the true value.

(4) Bias must be tested in accordance with an appropriate standard (if any).

(5) The value obtained from the samples must only be used for the delivery period, usage period or consignment of the gaseous designated fuel for which it was intended to be representative.

1.10JD Requirements for sampling gaseous designated fuels—prescribed alternative method

(1) A gaseous designated fuel mentioned in the column headed "Gaseous fuel" of an item of the table in subsection 2.26(3) must be sampled in accordance with a standard specified in the item for the fuel.

(2) A gaseous designated fuel may also be sampled in accordance with a standard that is equivalent to a standard that is set out for the gaseous designated fuel in the table in subsection 2.26(3).

1.10JE Standards for analysing samples of gaseous designated fuels—prescribed alternative method

(1) Samples of a gaseous designated fuel mentioned in the column headed "Fuel type" of an item of the table in subsection 2.24(1) must be analysed in accordance with one of the standards mentioned in:

(a) for analysis of energy content—the column headed "Energy content" for that item; and

(b) for analysis of gas composition—the column headed "Gas Composition" for that item.

(2) A gaseous designated fuel may also be sampled in accordance with a standard that is equivalent to a standard that is set out for the gaseous designated fuel in the table in subsection 2.24(1).

(3) The analysis must be undertaken by:
  (a) an accredited laboratory; or
  (b) a laboratory that meets requirements equivalent to those in AS ISO/IEC 17025:2005; or
  (c) using an online analyser if:
    (i) the online analyser is calibrated in accordance with an appropriate standard; and
    (ii) the online analysis is undertaken in accordance with this section.

(4) The density of a gaseous designated fuel must be analysed in accordance with ISO 6976:1995 or in accordance with a standard that is equivalent to that standard.

1.10JF Frequency of analysis—prescribed alternative method

(1) Subject to subsection (2), samples of gaseous designated fuel must be analysed:
  (a) for gas composition—monthly; and
  (b) for energy content:
    (i) if the samples are analysed using gas measuring equipment that is category 1 or 2 of the following table—monthly; or
    (ii) if the samples are analysed using gas measuring equipment that is category 3 or 4 of the following table—continuously.

Frequency of analysis

Item	Column 1 Gas measuring equipment category	Column 2 Maximum daily quantity of gaseous designated fuel that is supplied, entered for home consumption or received (excluding any quantity of gaseous designated fuel that is counted twice) (GJ/day)	Column 3 Transmitter and accuracy requirements (% of range)
1	1	0-1750	Pressure <±0.25% Diff. pressure <±0.25% Temperature <±0.50%
2	2	1751-3500	Pressure <±0.25% Diff. pressure <±0.25% Temperature <±0.50%
3	3	3501-17500	Smart transmitters: Pressure <±0.10% Diff. pressure <±0.10% Temperature <±0.25%
4	4	17501 or more	Smart transmitters: Pressure <±0.10%

Frequency of analysis			
Item	**Column 1**	**Column 2**	**Column 3**
	Gas measuring equipment category	**Maximum daily quantity of gaseous designated fuel that is supplied, entered for home consumption or received (excluding any quantity of gaseous designated fuel that is counted twice) (GJ/day)**	**Transmitter and accuracy requirements (% of range)**
			Diff. pressure <±0.10% Temperature <±0.25%

(2) If the liable entity certifies in writing that the frequency of analysis mentioned in subsection (1) will cause significant hardship or expenses to the liable entity, the analysis may be undertaken at a frequency that is less than the frequency mentioned in subsection (1) if the reduced analysis would allow for an unbiased estimate to be obtained.

Division 1.1B.3—Measuring amounts of gaseous designated fuel

1.10JG Purpose of Division

This Division sets out how quantities of gaseous designated fuels are to be estimated for the purpose of working out the potential emissions embodied in that fuel.

1.10JH Criteria for measurement

(1) For the purpose of calculating the potential emissions embodied in an amount of gaseous designated fuel and, in particular, for Q_i in subsections 1.10JA(1) and 1.10JB(2), the amount of fuel must be estimated in accordance with:
  (a) if the fuel was entered for home consumption—subsection (2); or
  (b) if paragraph (a) does not apply and the acquisition of the fuel was the subject of a commercial transaction—subsection (3); or
  (c) if paragraphs (a) and (b) do not apply—subsection (4).

(2) For paragraph (1)(a), the quantity of gaseous designated fuel must be estimated using:
  (a) records kept to substantiate quantities of fuel delivered in accordance with a permission granted under:
    (i) section 61C of the *Excise Act 1901*; or
    (ii) section 69 of the *Customs Act 1901*; or
  (b) for fuel acquired after it had been entered for home consumption—the quantity recorded in invoices or other documentation provided by the supplier.

(3) For paragraph (1)(b), the quantity of gaseous designated fuel must be estimated using one of the following criteria:
  (a) the amount of fuel, expressed in cubic metres or gigajoules, sold during the year as evidenced by invoices from the vendor of the fuel (***criterion A***);

(b) the criteria provided in section 1.10JI (***criterion AA***);
(c) the criteria provided in section 1.10JJ (***criterion AAA***).

(4) For paragraph (1)(c), the quantity of gaseous designated fuel must be estimated using one of the following criteria:
(a) the criteria provided in section 1.10JJ (***criterion AAA***);
(b) the criteria provided in section 1.10JQ (***criterion BBB***).

(5) Subject to subsection (6), the criteria provided for in subsection (3) may be used for the purpose of estimating part of an amount of gaseous designated fuel that has been previously entered for home consumption.

(6) If, during a year, criterion AA is used to estimate the quantity of the gaseous designated fuel, then, in each year after that year, only criterion AA or criterion AAA is to be used.

(7) If, during a year, criterion AAA is used to estimate the quantity of the gaseous designated fuel, then, in each year after that year, only criterion AAA is to be used.

1.10JI Indirect measurement—criterion AA

For paragraph 1.10JH(3)(b), criterion AA is the amount of gaseous designated fuel acquired during the year (evidenced by invoices) as adjusted for the estimated change in the quantity of the person's stockpile of the fuel during the year.

1.10JJ Direct measurement—criterion AAA

(1) For paragraphs 1.10JH(3)(c) and (4)(a), criterion AAA is the measurement of the gaseous designated fuel that is acquired.

(2) In measuring the quantity of gaseous designated fuel the quantities of gas must be measured:
(a) using volumetric measurement in accordance with:
(i) for gases other than super-compressed gases—section 1.10JK; and
(ii) for super-compressed gases—sections 1.10JK and 1.10JL; and
(b) using gas measuring equipment that complies with section 1.10JM.

(3) The measurement must be carried out:
(a) at the point of liability using gas measuring equipment that:
(i) is in a category specified in column 1 of an item in the table in section 1.10JF according to the maximum daily quantity specified in column 2 of the table; and
(ii) complies with the transmitter and accuracy requirements specified, for the item, in column 3 of the table; or
(b) at the point of sale using measuring equipment that complies with paragraph (a).

(4) Paragraph (3)(b) only applies if:

(a) the change in the stockpile of the fuel for the person for the year is less than 1% of total liability on average for the person during the year; and

(b) the change in the stockpile of the fuel for the person for the year is less than 1% of the person's liability for the fuel during the year.

1.10JK Volumetric measurement—gaseous designated fuels

(1) For subparagraph 1.10JJ(2)(a)(i) and (ii), volumetric measurement must be calculated at standard conditions and expressed in cubic metres.

(2) The volumetric measurement must be calculated using a flow computer that measures and analyses the following at the point of liability for the gaseous designated fuel:

(a) flow symbols;

(b) relative density;

(c) gas composition.

(3) The volumetric flow rate must be:

(a) continuously recorded; and

(b) continuously integrated using an integration device.

(4) All measurements, calculations and procedures used in determining volume (except for any correction for deviation from the ideal gas law) must be made in accordance with:

(a) the instructions mentioned in subsection (5); or

(b) an internationally recognised standard or code that is equivalent to an instruction mentioned, for a system, in paragraph (5)(a), (b) or (c).

Note: An example of an internationally recognised equivalent standard is New Zealand standard NZS 5259:2004.

(5) For paragraph (4)(a), the instructions are those mentioned in:

(a) for orifice plate measuring systems:

(i) the publication entitled *AGA Report No. 3, Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids Part 3: Natural Gas Applications*, published by the American Gas Association in August 1992; or

(ii) Parts 1 to 4 of the publication entitled *ANSI/API MPMS Chapter 14.3 Part 2 (R2011) Natural Gas Fluids Measurement: Concentric, Square-Edged Orifice Meters - Part 2: Specification and Installation Requirements*, fourth edition, published by the American Petroleum Institute on 30 April 2000; and

(b) for turbine measuring systems—the publication entitled *AGA Report No. 7, Measurement of Natural Gas by Turbine Meter (2006)*, published by the American Gas Association on 1 January 2006; and

(c) for positive displacement measuring systems—the publication entitled *ANSI B109.3—2000, Rotary Type Gas Displacement Meters*, published by the American Gas Association on 13 April 2000.

(6) Measurements must comply with Australian legal units of measurement.

1.10JL Volumetric measurement—super-compressed gases

(1) For subparagraph 1.10JJ(2)(a)(ii), this section applies in relation to measuring the volume of super-compressed natural gases.

(2) If it is necessary to correct the volume for deviation from the ideal gas law, the correction must be determined using the relevant method set out in the publication entitled *AGA Report No. 8, Compressibility Factor of Natural Gas and Related Hydrocarbon Gases (1994)*, published by the American Gas Association on 1 January 1994.

(3) The measuring equipment used must calculate super-compressibility by:
   (a) if the measuring equipment is category 3 or 4 equipment in accordance with the table in section 1.10JF—using gas composition data; or
   (b) if the measuring equipment is category 1 or 2 equipment in accordance with the table in section 1.10JF—using an alternative method set out in the publication entitled *AGA Report No. 8, Compressibility Factor of Natural Gas and Related Hydrocarbon Gases (1994)*, published by the American Gas Association on 1 January 1994.

1.10JM Gas measuring equipment—requirements

For paragraph 1.10JJ(2)(b), gas measuring equipment that is category 3 or 4 equipment in accordance with the table in section 1.10JF must comply with the following requirements:
   (a) if the equipment uses flow devices—the requirements relating to flow devices set out in section 1.10JN;
   (b) if the equipment uses flow computers—the requirement relating to flow computers set out in section 1.10JO;
   (c) if the equipment uses gas chromatographs—the requirements relating to gas chromatographs set out in section 1.10JP.

1.10JN Flow devices—requirements

(1) This section is made for paragraph 1.10JM(a).

(2) If the measuring equipment has flow devices that use orifice measuring systems, the flow devices must be constructed in a manner that ensures that the maximum uncertainty of the discharge coefficient is not more than ±1.5%.

Note: The publication entitled *AGA Report No. 3, Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids Part 3: Natural Gas Applications*, published by the American Gas Association in August 1992, sets out a manner of construction that ensures that the maximum uncertainty of the discharge coefficient is not more than ±1.5%.

(3) If the measuring equipment has flow devices that use turbine measuring systems, the flow devices must be installed in a manner that ensures that the maximum uncertainty of the flow measurement is not more than ±1.5%.

Note: The publication entitled *AGA Report No. 8, Compressibility Factor of Natural Gas and Related Hydrocarbon Gases (1994)*, published by the American Gas Association on 1 January 1994, sets out a manner of installation that ensures that the maximum uncertainty of the flow measurement is not more than ±1.5%.

(4) If the measuring equipment has flow devices that use positive displacement measuring systems, the flow devices must be installed in a manner that ensures that the maximum uncertainty of flow is ±1.5%.

Note: The publication entitled *ANSI B109.3—2000, Rotary Type Gas Displacement Meters, published by the American Gas Association on 13 April 2000*, sets out a manner of installation that ensures that the maximum uncertainty of flow is ±1.5%.

(5) If the measuring equipment uses any other type of flow device, the maximum uncertainty of flow measurement must not be more than ±1.5%.

(6) All flow devices that are used by gas measuring equipment in a category specified in column 1 of an item in the table in section 1.10JF must, wherever possible, be calibrated for pressure, differential pressure and temperature:
(a) in accordance with the requirements specified, for the item, in column 3 of the table; and
(b) taking into account the effects of static pressure and ambient temperature.

1.10JO Flow computers—requirements

For paragraph 1.10JM(b), the requirement is that the flow computer that is used by the equipment for measuring purposes must record:
(a) the instantaneous values for all primary measurement inputs; and
(b) the following outputs:
(i) instantaneous corrected volumetric flow;
(ii) cumulative corrected volumetric flow;
(iii) for turbine and positive displacement metering systems—instantaneous uncorrected volumetric flow;
(iv) for turbine and positive displacement metering systems—cumulative uncorrected volumetric flow;
(v) super-compressibility factor.

1.10JP Gas chromatographs—requirements

For paragraph 1.10JM(c), the requirements are that gas chromatographs used by the measuring equipment must:
(a) be factory tested and calibrated using a measurement standard:
(i) that is produced by gravimetric methods; and
(ii) that uses Australian legal units of measurement; and
(b) perform gas composition analysis with an accuracy of:
(i) ±0.15% for use in calculation of gross calorific value; and
(ii) ±0.25% for calculation of relative density; and
(c) include a mechanism for re-calibration against a certified reference gas.

1.10JQ Simplified measurements—criterion BBB

For paragraph 1.10JH(4)(b), criterion BBB is the estimation of gaseous designated fuel in accordance with industry practice if the measuring equipment used to estimate the amount of the fuel does not meet the requirements of criterion AAA.

Part 1.1C—Potential greenhouse gas emissions embodied in an amount of liquid designated fuel

Division 1.1C.1—Preliminary

1.10K Purpose of Part

This Part provides for:

(a) measuring potential greenhouse gas emissions embodied in an amount of liquid designated fuel in accordance with the default method set out in section 1.10KA; and

(b) ascertaining the potential greenhouse gas emissions embodied in an amount of liquid designated fuel in accordance with the prescribed alternative method set out in Subdivision 1.1C.2.2.

Division 1.1C.2—Available methods

Subdivision 1.1C.2.1—Default method—liquid designated fuels

1.10KA Default method

(1) For subsection 7B(2) of the Act, the amount of greenhouse gas that would be released into the atmosphere as a result of the combustion of an amount of liquid designated fuel is determined to be the amount that results from using the following formula:

$$E_i = Q_i \times A_i$$

where:

A*$_i$** is the value specified for subsection 7B(2) of the Act for gaseous designated fuel type (i***), worked out using the formula in subsection (2).

E*$_i$** is the amount of greenhouse gas that would be released into the atmosphere as a result of the combustion of each gaseous designated fuel type (i***), measured in CO_2-e tonnes.

Q*$_i$** is the amount of liquid designated fuel type (i***), measured in kilolitres, supplied to a person for:

(a) stationary energy purposes; and

(b) transport energy purposes;

during a reporting year and estimated in accordance with Division 1.1C.3.

(2) For subsection (1), ***A*$_i$** is worked out using the following formula:

$$\frac{\left(EC_i \times EF_{iCO_2ox,ec}\right) + \left(EC_i \times EF_{iCH_4}\right) + \left(EC_i \times EF_{iN_2O}\right)}{1\,000}$$

where:

EC**$_i$* is the energy content factor for liquid designated fuel type (i***) as mentioned in:

(a) for stationary energy purposes—Part 3 of Schedule 1; and

(b) for transport energy purposes—Part 4 of Schedule 1.

EF**$_{iCH_4}$* is the emission factor for CH_4 mentioned for the liquid designated fuel type (i***) in:

(a) for stationary energy purposes—Part 3 of Schedule 1; and

(b) for transport energy purposes—Part 4 of Schedule 1.

EF**$_{iCO_2ox,ec}$* is the emission factor for CO_2 mentioned for the liquid designated fuel type (i***) in:

(a) for stationary energy purposes—Part 3 of Schedule 1; and

(b) for transport energy purposes—Part 4 of Schedule 1.

EF**$_{iN_2O}$* is the emission factor for N_2O mentioned for the liquid designated fuel type (i***) in:

(a) for stationary energy purposes—Part 3 of Schedule 1; and

(b) for transport energy purposes—Part 4 of Schedule 1.

(3) In this section:

stationary energy purposes means purposes for which fuel is combusted that do not involve transport energy purposes.

transport energy purposes means purposes for which fuel is combusted that consist of any of the following:

(a) transport by vehicles registered for road use;

(b) rail transport;

(c) marine navigation;

(d) air transport.

Subdivision 1.1C.2.2—Prescribed alternative method—liquid designated fuels

1.10KB Prescribed alternative method

(1) For subsections 7B(3) and 7B(4) of the Act, this Subdivision specifies the prescribed alternative method for ascertaining the potential greenhouse gas emissions embodied in an amount of liquid designated fuel.

(2) For subsection (1), the potential greenhouse gas emissions embodied in an amount of liquid designated fuel is worked out using the following formula:

$$E_i = \frac{Q_i \times EC_i \times \left(EF_{iCH_4} + EF_{iN_2O} + EF_{iCO_2ox,ec} \right)}{1000}$$

where:

E**i* is the potential greenhouse gas emissions embodied in an amount of liquid designated fuel type (i***), measured in CO_2-e tonnes.

EC**i* is the energy content factor for liquid designated fuel type (i***) as mentioned in:

(a) for stationary energy purposes—Part 3 of Schedule 1; and

(b) for transport energy purposes—Part 4 of Schedule 1.

EF_{iCH_4} is the emission factor for CH_4 mentioned for the liquid designated fuel type (***i***) in:

(a) for stationary energy purposes—Part 3 of Schedule 1; and

(b) for transport energy purposes—Part 4 of Schedule 1.

EF_{iN_2O} is the emission factor for N_2O mentioned for the liquid designated fuel type (***i***) in:

(a) for stationary energy purposes—Part 3 of Schedule 1; and

(b) for transport energy purposes—Part 4 of Schedule 1.

$EF_{iCO_2ox,ec}$ is the carbon dioxide emission factor for liquid designated fuel type (***i***) measured in kilograms of CO_2-e per gigajoule and calculated in accordance with subsection (3).

Q**i* is the quantity of liquid designated fuel type (i***) supplied to a person for:

(a) stationary energy purposes; and

(b) transport energy purposes;

during a reporting year and measured in accordance with Division 1.1C.3.

(3) For subsection (2), the emission factor $EF_{iCO_2ox,ec}$ is worked out as follows:

Method statement

Step 1. Estimate $EF_{iCO_2ox,kg}$ using the formula:

$$EF_{iCO_2ox,kg} = \frac{C_a}{100} \times OF_i \times 3.664$$

where:

***C**a* is the carbon in the liquid designated fuel expressed as a percentage of the mass of the fuel as received, as sampled, or as combusted, as the case may be.

$EF_{iCO_2ox,kg}$ is the carbon dioxide emission factor for liquid designated fuel type (***i***) incorporating the effects of a default oxidation factor expressed as kilograms of dioxide per kilogram of liquid designated fuel type (***i***), worked out under this step.

***OF**i* is the oxidation factor 0.99.

Note: 3.664 converts tonnes of carbon to tonnes of carbon dioxide.

Step 2. Work out $EF_{iCO_2ox,ec}$ using the formula:

$$EF_{iCO_2ox,ec} = EF_{iCO_2ox,kg} \div \left(\frac{EC_i}{C_i} \right)$$

where:

C_i is the density of the liquid designated fuel type (***i***) expressed in kilograms of fuel per thousand litres, analysed in accordance with a standard mentioned in subsection 1.10KD.

EC_i is the energy content factor for liquid designated fuel type (***i***) as mentioned in:

(a) for stationary purposes—Part 3 of Schedule 1; and

(b) for transport energy purposes—Part 4 of Schedule 1.

$EF_{iCO_2ox,kg}$ is the carbon dioxide emission factor for liquid designated fuel type (***i***) worked out under step 1.

1.10KC General requirements for sampling liquid designated fuels—prescribed alternative method

(1) A sample of a liquid designated fuel must be derived from a composite of amounts of the liquid designated fuel.

(2) The samples must be collected on enough occasions to produce a representative sample.

(3) The samples must be free of bias so that any estimates are neither over nor under estimates of the true value.

(4) Bias must be tested in accordance with an appropriate standard (if any).

(5) The value obtained from the samples must only be used for the delivery period or consignment of the liquid designated fuel for which it was intended to be representative.

1.10KD Requirements for sampling liquid designated fuels—prescribed alternative method

A liquid designated fuel that is mentioned in the column headed "Liquid Fuel" of an item of the table in subsection 2.47(3) must be sampled in accordance with:

(a) a standard specified in the item for the fuel; or

(b) a standard that is equivalent to a standard specified in the item for the fuel.

1.10KE Standards for analysing samples of liquid designated fuels—prescribed alternative method

(1) Samples of a liquid designated fuel that is mentioned in the column headed "Fuel" of an item of the table in subsection 2.45(1) must be analysed in accordance with a standard (if any) mentioned in:

(a) for energy content analysis—the column headed "Energy Content" for that item; and

(b) for carbon analysis—the column headed "Carbon" for that item; and

(c) density analysis—the column headed "Density" for that item.

(2) A liquid designated fuel that is mentioned in the column headed "Fuel" of an item of the table in subsection 2.45(1) may also be analysed:

(a) for energy content—in accordance with a standard that is equivalent to a standard mentioned in the column headed "Energy Content" for that item; and

(b) for carbon—in accordance with a standard that is equivalent to a standard mentioned in the column headed "Carbon" for that item; and

(c) for density—in accordance with a standard that is equivalent to a standard mentioned in the column headed "Density" for that item.

(3) Analysis must be undertaken by:

(a) an accredited laboratory; or

(b) a laboratory that meets requirements equivalent to those in AS ISO/IEC 17025:2005.

1.10KF Frequency of analysis—prescribed alternative method

Liquid designated fuel of a type mentioned in column 1 of an item in the following table must be analysed for the parameter mentioned in column 2 for that item at least at the frequency mentioned in column 3 for that item.

Frequency of analysis

Item	Column 1 Liquid Designated Fuel	Column 2 Parameter	Column 3 Frequency
1	All types of liquid designated fuel	Carbon	Quarterly or by delivery of the liquid designated fuel
2	All types of liquid designated fuel	Energy	Quarterly or by delivery of the liquid designated fuel

Division 1.1C.3—Measuring amounts of liquid designated fuel

1.10KG Purpose of Division

This Division sets out how quantities of liquid designated fuels are to be estimated for the purpose of working out the potential emissions embodied in that fuel.

1.10KH Criteria for measurement

(1) For the purpose of working out the potential emissions embodied in an amount of liquid designated fuel and, in particular, for Q_i in subsections 1.10KA(1) and 1.10KB(2), the amount of fuel must be estimated in accordance with:
  (a) if the fuel is liquefied petroleum gas—subsection (2); or
  (b) if paragraph (a) does not apply and the fuel is used by a person who entered it for home consumption—subsection (2); or
  (c) if paragraph (a) does not apply and the fuel is used by a person who did not enter it for home consumption—subsection (3); or
  (d) if paragraphs (a), (b) and (c) do not apply and the acquisition of the fuel was the subject of a commercial transaction—subsection (3); or
  (e) if paragraphs (a) to (d) do not apply—subsection (4).

(2) For paragraphs (1)(a) and (b), the quantity of liquid designated fuel must be estimated using:
  (a) records kept to substantiate quantities of fuel delivered in accordance with a permission granted under:
    (i) section 61C of the *Excise Act 1901*; or
    (ii) section 69 of the *Customs Act 1901*; or
  (b) for fuel acquired after it had been entered for home consumption—the quantity recorded in invoices or other documentation provided by the supplier.

(3) For paragraphs (1)(c) and (d), the quantity of liquid designated fuel must be estimated using one of the following criteria:
  (a) the amount of fuel acquired during the year as evidenced by invoices from the vendor of the fuel (***criterion A)***;
  (b) the criteria provided in section 1.10KI (***criterion AA***);
  (c) the criteria provided in section 1.10KJ (***criterion AAA***).

(4) For paragraph (1)(e), the quantity of liquid designated fuel must be estimated using one of the following criteria:
  (a) the criteria provided in section 1.10KJ (***criterion AAA***);
  (b) the criteria provided in section 1.10KK (***criterion BBB***).

(5) Subject to subsection (6), the criteria provided for in subsection (3) may be used for the purpose of estimating part of an amount of liquid designated fuel that has been previously entered for home consumption.

(6) If, during a year, criterion AA is used to estimate the quantity of the liquid designated fuel, then, in each year after that year, only criterion AA or criterion AAA is to be used.

(7) If, during a year, criterion AAA is used to estimate the quantity of the liquid designated fuel, then, in each year after that year, only criterion AAA is to be used.

1.10KI Indirect measurement—criterion AA

For paragraph 1.1KH(3)(b), criterion AA is the amount of the liquid designated fuel acquired during the year (evidenced by invoices) as adjusted for the estimated change in the quantity of the person's stockpile of the fuel during the year.

1.10KJ Direct measurement—criterion AAA

(1) For paragraphs 1.10KH(3)(c) and (4)(a), criterion AAA is a measurement of the liquid designated fuel that is acquired.

(2) The measurement must be carried out:
  (a) at the point of liability at ambient temperatures and converted to standard temperatures, using measuring equipment calibrated to a measurement requirement; or
  (b) at the point of sale of the liquid designed fuel at ambient temperatures and converted to standard temperatures, using measuring equipment calibrated to a measurement requirement.

(3) Paragraph (2)(b) only applies if:
  (a) the change in the stockpile of fuel for the person for the year is less than 1% of total liability on average for the person during the year; and
  (b) the change in the stockpile of the fuel for the person during the year is less than 1% of the person's liability for the fuel during the year.

1.10KK Simplified measurements—criterion BBB

For paragraph 1.10KH(4)(b), criterion BBB is the estimation of the amount of a liquid designated fuel using accepted industry measuring devices or, in the absence of such measuring devices, in accordance with industry practice if the equipment used to measure the amount of the fuel is not calibrated to a measurement requirement.

1.10KL Information to be used when ascertaining interim and provisional emissions numbers

(1) When ascertaining an interim emissions number for the purposes of subsection 126(7A) or (8) of the *Clean Energy Act 2011*:
  (a) information available on 1 April immediately before the end of the eligible financial year must be used; and
  (b) information available after 1 April of the eligible financial year may be used.

(2) When ascertaining a provisional emissions number for the purposes of Division 7 of Part 3 of the *Clean Energy Act 2011*:
  (a) information available on 1 July immediately following the end of the eligible financial year must be used; and
  (b) information available after 1 July of the eligible financial year may be used.

1.10KM Apportionment of specified taxable fuel between uses that are eligible and ineligible fuel tax credits

An amount of specified taxable fuel determined in accordance with this Division may be apportioned between uses that are eligible and ineligible for fuel tax credits using the records of a GST group, a GST joint venture or a liable entity if the records are based on at least one of the following:

(a) records of business expenses that relate to activities conducted in the course of carrying on the enterprise;
(b) sales and production records;
(c) lease documents for agricultural land or equipment;
(d) share farming contracts;
(e) vehicle and equipment use and maintenance records;
(f) work contracts or government requirements (such as licences).

Division 1.1C.4—Adjustment to provisional emissions number

1.10KN Adjustment to provisional emissions number

(1) This section sets out how to increase or reduce, as the case may be, the provisional emissions number for an eligible financial year for the purposes of subsections 10(6) and 10(8) of the Act.

(2) This section applies in relation to reports under the Act relating to a financial year beginning on or after 1 July 2014.

(3) The provisional emissions number is taken to be:

$$PEN + PEN_{Adjustment}$$

where:

PEN is the provisional emissions number for the eligible financial year for the purposes of Division 7 of Part 3 of the *Clean Energy Act 2011*.

$\boldsymbol{PEN_{Adjustment}}$ is the number ascertained in accordance with subsection (4), which may be positive or negative.

(4) $\boldsymbol{PEN_{Adjustment}}$ is equal to:

$$PEN_{Revised} - PEN_{Reported}$$

where:

$\boldsymbol{PEN_{Reported}}$ is the provisional emissions number for the purposes of Division 7 of Part 3 of the *Clean Energy Act 2011* reported by the person for the previous eligible financial year in accordance with section 22A of the Act.

$\boldsymbol{PEN_{Revised}}$ is the provisional emissions number a person had for the previous eligible financial year for the purposes of Division 7 of Part 3 of the *Clean Energy Act 2011*, recalculated using information available on 1 July in the year following the eligible financial year.

(5) A provisional emissions number cannot be reduced below zero.

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20 Paragraph 1.13(b)

After "corporation", insert "or liable entity".

21 Paragraph 1.13(b)

After "corporations", insert "or entities".

22 Paragraph 1.13(c)

After "corporation", insert "or liable entity".

23 Section 1.18 (heading)

Repeal the heading, substitute:

1.18 Method to be used for a separate occurrence of a source

24 Subsection 1.18(1)

Omit "source", substitute "separate occurrence of a source".

25 Subsection 1.18(2)

Repeal the subsection, substitute:

(2) Subject to subsection (3) and (3A), one method for the separate occurrence of a source must be used for 4 reporting years unless another higher method is used.

26 Subsection 1.18(3)

Repeal the subsection, substitute:

(3) If:

(a) at a particular time, a method is being used to estimate emissions in relation to the separate occurrence of a source; and

(b) either:

(i) in the preceding 4 reporting years before that time, only that method has been used to estimate the emissions from the separate occurrence of the source; or

(ii) a registered corporation or liable entity certifies in writing that the method used was found to be non-compliant during an external audit of the separate occurrence of the source;

then a lower method may be used to estimate emissions in relation to the separate occurrence of the source from that time.

(3A) If section 22AA of the Act applies to a person, a lower method may be used to estimate emissions in relation to the source for the purposes of reporting under section 22AA.

27 Subsections 1.18(5) and (6)

Repeal the subsections, substitute:

(5) ***Higher method***, is:

(a) a prescribed alternative method; or

(b) in relation to a method (the ***original method***) being used to estimate emissions in relation to a separate occurrence of a source, a method for the source with a higher number than the number of the original method.

(6) ***Lower method***, is:

(a) a default method; or

(b) in relation to a method (the ***original method***) being used to estimate emissions in relation to a separate occurrence of a source, a method for the source with a lower number than the number of the original method.

28 Subsection 1.19(1)

Omit "source or potential greenhouse gas emissions embodied in an amount of natural gas", substitute "separate occurrence of a source or potential greenhouse gas emissions embodied in an amount of designated fuel".

29 Subsection 1.19(2)

Repeal the subsection, substitute:

(2) For each day or part of a day during the down time, the estimation of emissions from the separate occurrence of a source or potential greenhouse gas emissions embodied in an amount of designated fuel must be consistent with the principles in section 1.13.

30 Subsection 1.19(4)

Repeal the subsection, substitute:

(4) If down time is more than 6 weeks in a year, the registered corporation or liable entity must inform the Regulator, in writing, of the following:

(a) the reason why down time is more than 6 weeks;

(b) how the corporation or entity plans to minimise down time;

(c) how emissions have been estimated during the down time.

(5) The information mentioned in subsection (4) must be given to the Regulator within 6 weeks after the day when down time exceeds 6 weeks in a year.

(6) The Regulator may require a registered corporation or liable entity to use method 1 to estimate emissions during the down time if:

(a) method 2, 3 or 4 has been used to estimate emissions for the separate occurrence of a source; and

(b) down time is more than 6 weeks in a year.

31 At the end of Subdivision 1.3.2.1

Add:

1.21A Emissions from a source where multiple fuels consumed

If more than one fuel is consumed for a source that generates carbon dioxide that is directly measured using method 4 (CEM), the total amount of carbon dioxide is to be attributed to each fuel consumed in proportion to the carbon content of the fuel relative to the total carbon content of all fuel consumed for that source.

32 After section 1.27

Insert:

1.27A Emissions from a source where multiple fuels consumed

If more than one fuel is consumed for a source that generates carbon dioxide that is directly measured using method 4 (PEM), the total amount of carbon dioxide is to be attributed to each fuel consumed in proportion to the carbon content of the fuel relative to the total carbon content of all fuel consumed for that source.

33 Section 2.2

Repeal the section, substitute:

2.2 Application

This Part applies to emissions released from the combustion of solid fuel in relation to a separate instance of a source if the amount of solid fuel combusted in relation to the separate instance of the source is more than 1 tonne.

34 Subsection 2.12(3) (table item 1)

Repeal the item, substitute:

1	Bituminous coal	AS 4264.1—1995
1A	Sub-bituminous coal	AS 4264.1—1995
1B	Anthracite	AS 4264.1—1995

35 Subsection 2.15(2)

Repeal the subsection, substitute:

(2) To work out the adjustment for the estimated change in the quantity of the stockpile of the fuel for the facility during the year, one of the following approaches must be used:

(a) the survey approach mentioned in subsection (2C);

(b) the error allowance approach mentioned in subsection (2D).

(2A) The approach selected must be consistent with the principles mentioned in section 1.13.

(2B) The same approach, once selected, must be used for the facility for each year unless:

(a) there has been a material change in the management of the stockpile during the year; and

(b) the change in the management of the stockpile results in the approach selected being less accurate than the alternative approach.

(2C) The survey approach is as follows:

Step 1. Estimate the quantity of solid fuel in the stockpile by:

(a) working out the volume of the solid fuel in the stockpile using aerial or general survey in accordance with industry practice; and

(b) measuring the bulk density of the stockpile in accordance with subregulation (3).

Step 2. Replace the current book quantity with the quantity estimated under step 1.

Step 3. Maintain the book quantity replaced under step 2 by:

(a) adding deliveries made during the year, using:

(i) invoices received for solid fuel delivered to the facility; or

(ii) solid fuel sampling and measurements provided by measuring equipment calibrated to a measurement requirement; and

(b) deducting from the amount calculated under paragraph (a), solid fuel consumed by the facility.

Step 4. Use the book quantity maintained under step 3 to estimate the change in the quantity of the stockpile of the fuel.

(2D) The error allowance approach is as follows:

Step 1. Estimate the quantity of the stockpile by:

(a) working out the volume of the solid fuel in the stockpile using aerial or general survey in accordance with industry practice; and

(b) measuring the bulk density of the stockpile in accordance with subregulation (3).

Step 2. Estimate an error tolerance for the quantity of solid fuel in the stockpile. The error tolerance is an estimate of the uncertainty of the quantity of solid fuel in the stockpile and must be:

(a) based on stockpile management practices at the facility and the uncertainty associated with the energy content and proportion of carbon in the solid fuel; and

(b) consistent with the general principles in section 1.13; and

(c) not more than 6% of the estimated value of the solid fuel in the stockpile worked out under step 1.

Step 3. Work out the percentage difference between the current book quantity and the quantity of solid fuel in the stockpile estimated under step 1.

Step 4.	If the percentage difference worked out under step 3 is within the error tolerance worked out under step 2, use the book quantity to estimate the change in the quantity of the stockpile of the fuel.
Step 5.	If the percentage difference worked out in step 3 is more than the error tolerance worked out in step 2:
	(a) adjust the book quantity by the difference between the percentage worked out under step 3 and the error tolerance worked out under step 2; and
	(b) use the book quantity adjusted under paragraph (a) to estimate the change in the quantity of the stockpile of the fuel.

36 At the end of regulation 2.15

Add:

(5) In this section:

book quantity means the quantity recorded and maintained by the facility operator as the quantity of solid fuel in the stockpile.

37 Section 2.18

Repeal the section, substitute:

2.18 Application

This Part applies to emissions released from the combustion of gaseous fuels in relation to a separate instance of a source if the amount of gaseous fuel combusted in relation to the separate instance of the source is more than 1000 cubic metres.

38 Section 2.25 (cell at table item 2, column headed "Frequency")

After "corporation", insert "or liable entity".

39 Section 2.30 (heading)

Repeal the heading, substitute:

2.30 Indirect measurement—criterion AA

40 Section 2.31 (heading)

Repeal the heading substitute:

2.31 Direct measurement—criterion AAA

41 Subsections 2.31(1) and (2)

Omit "at the point of combustion".

42 Paragraph 2.31(3)(a)

After "out", insert "at the point of combustion".

43 Section 2.39

Repeal the section, substitute:

2.39 Application

This Part applies to emissions released from:

(a) the combustion of petroleum based oil (other than petroleum based oil used as fuel) or petroleum based grease, in relation to a separate instance of a source, if the total amount of oil and grease combusted in relation to the separate instance of the source is more than 5 kilolitres; and

(b) for a liquid fuel not of the kind mentioned in paragraph (a)—the combustion of liquid fuel in relation to a separate instance of a source, if the total amount of liquid fuel combusted in relation to the separate instance of the source is more than 1 kilolitre.

44 Section 2.51 (heading)

Repeal the heading, substitute:

2.51 Indirect measurement—criterion AA

45 Section 2.52 (heading)

Repeal the heading, substitute:

2.52 Direct measurement—criterion AAA

46 Subsection 2.52(1)

Omit "at the point of combustion".

47 Subparagraph 2.68(b)(v)

Omit "0", substitute "20 000".

48 Section 2.71

After "reporting corporation", insert "or liable entity".

49 Section 2.71

Omit "corporation's records", substitute "records of the corporation or liable entity".

50 Section 2.71

After "the corporation", insert "or the liable entity".

51 Paragraphs 3.4(4)(b) and (c)

Repeal the paragraphs, substitute:

(b) one of the following methods must be used for estimating emissions of methane released:

(i) method 1 under section 3.14;

(ii) method 2 under section 3.15A; and

(c) one of the following methods must be used for estimating emissions of nitrous oxide released:

(i) method 1 under section 3.14;

(ii) method 2 under section 3.15A.

52 Subsection 3.4(4) (note)

Repeal the note, substitute:

Note: The flaring of coal mine waste gas releases emissions of carbon dioxide, methane and nitrous oxide. The reference to gas type (***j***) in method 1 under section 3.14 or method 2 under section 3.15A is a reference to these gases. The same formula in Method 1 is used to estimate emissions of each of these gases. There is no method 4 for emissions of carbon dioxide and no method 3 or 4 for emissions of methane or nitrous oxide.

53 Section 3.15

Repeal the section, substitute:

3.15 Method 2—emissions of carbon dioxide from coal mine waste gas flared

For subparagraph 3.4(4)(a)(ii), method 2 is:

$$E_{ico_2} = \frac{Q_k \times EC_i \times EF_k}{1000} \times OF_i + QCO_2$$

where:

E_{iCO_2} is the emissions of CO_2 released from coal mine waste gas (***i***) flared from the mine during the year, measured in CO_2-e tonnes.

EC_i is the energy content factor of the methane (***k***) within coal mine waste gas (***i***) mentioned in item 19 of Schedule 1, measured in gigajoules per cubic metre.

EF_k is the emission factor for the methane (***k***) within the fuel type from the mine during the year, measured in kilograms of CO_2-e per gigajoule, estimated in accordance with Division 2.3.3.

OF_i is 0.98/0.995, which is the correction factor for the oxidation of coal mine waste gas (***i***) flared.

Q_k is the quantity of methane (***k***) within the fuel type from the mine during the year, measured in cubic metres in accordance with Division 2.3.6.

QCO_2 is the quantity of carbon dioxide within the coal mine waste gas emitted from the mine during the year, measured in CO_2-e tonnes in accordance with Division 2.3.3.

3.15A Method 2—emissions of methane and nitrous oxide from coal mine waste gas flared

For subparagraphs 3.4(4)(b)(ii) and (c)(ii), method 2 is:

$$E_{ij} = \frac{Q_k \times EC_i \times EF_{kj}}{1000} \times OF_i$$

where:

E**ij is the emissions of gas type (***j***), being methane or nitrous oxide, released from coal mine waste gas (***i***) flared from the mine during the year, measured in CO_2-e tonnes.

EC**i is the energy content factor of methane (***k***) within coal mine waste gas (***i***) mentioned in item 19 of Schedule 1, measured in gigajoules per cubic metre.

EF**kj is the emission factor of gas type (***j***), being methane or nitrous oxide, for the quantity of methane (***k***) within coal mine waste gas (***i***) flared, mentioned in item 19 of Schedule 1 and measured in kilograms of CO_2-e per gigajoule.

OF**i is 0.98/0.995, which is the correction factor for the oxidation of coal mine waste gas (***i***) flared.

Q**k is the quantity of methane (***k***) within the coal mine waste gas (***i***) flared from the mine during the year, measured in cubic metres in accordance with Division 2.3.3.

54 Subsection 3.16(2)

Omit "***EF**h*", substitute "***EF**k*".

55 Section 3.20 (paragraph (b) of the definition of *EF**j*)

Omit "0.0007", substitute "0.00023".

56 At the end of section 3.42

Add:

; and (e) well workovers.

57 Subsection 3.46A(2)

Repeal the subsection, substitute:

(2) To estimate emissions that result from deliberate releases from process vents, systems upsets and accidents at a facility during a year, for each oil or gas exploration activity one of the following methods must be used:

(a) method 1 under section 3.84;

(b) method 4 under:

(i) for emissions of methane and carbon dioxide from coal seam gas well completions or well workover activities—section 3.46B; or

(ii) for emissions and activities not mentioned in subparagraph (i)—Part 1.3.

58 At the end of Subdivision 3.3.2.3

Add:

3.46B Method 4—vented emissions from well completions and well workovers

Vented volume measured for all wells and well types in a basin

(1) For subparagraph 3.46A(2)(b)(i), where vented volume is measured for all wells and well types (horizontal or vertical) in a basin, method 4 is:

$$Em_j = \gamma_j \times \left[\sum_{p=1}^{W} ES_p + \left(\sum_{j=1}^{Z} VIGG_{j,p} \right) \right]$$

where:

Em$_j$ is total emissions for gas type (***j***), being methane and carbon dioxide from all well completions and well workovers during a year in a basin, measured in CO_2-e tonnes.

ES$_p$ is the volume of methane vented during a well completion or well workover from strata for each well (***p***) in cubic metres at standard conditions, worked out in accordance with subsection (2).

VIGG$_{j,p}$ is the volume of gas type (***j***) in cubic metres at standard conditions, being methane and carbon dioxide, injected into the well during well completion or well workover, worked out in accordance with subsection (3).

W is the total number of well completions and well workovers in the basin during a year.

γ_j is the factor for converting a quantity of gas type (***j***) from cubic metres at standard conditions to CO_2-e tonnes, being:

(a) for methane—$6.784 \times 10^{-4} \times 21$; and

(b) for carbon dioxide—1.861×10^{-3}.

Z is the total number of greenhouse gas types.

(2) For subsection (1), the factor ***ES$_p$*** is worked out using the formula:

$$FV_p - VI_p$$

where:

FV$_p$ is the flow volume of each well (***p***) in cubic metres at standard conditions, measured using a digital or analog recording flow metre on the vent line to measure flowback during the well completion or well workover, estimated in accordance with Division 2.3.6.

VI$_p$ is the volume of injected gas in cubic metres at standard conditions that is injected into the well during the well completion or well workover, estimated in accordance with Division 2.3.6.

(3) For subsection (1), ***VIGG$_{j,p}$*** is worked out using the following formula:

$$VI_p \times mol_{j,p}\%$$

where:

mol$_{j,p}$%, for each gas type (***j***), being methane and carbon dioxide, is the gas type's share of one mole of ***VI$_p$*** expressed as a percentage, estimated in accordance with Division 2.3.3.

VI$_p$ is the volume of injected gas in cubic metres at standard conditions that is injected into the well during the well completion or well workover, estimated in accordance with Division 2.3.6.

Vented volume measured for a sample of wells and well types in a basin

(4) For subparagraph 3.46A(2)(b)(i), where vented volume is measured for a sample of wells and well types (horizontal or vertical) in a basin, method 4 is:

$$Em_j = \gamma_j \times \left[\sum_{p=1}^{W} EV_p + \sum_{j=1}^{Z} \left(VIGG_{j,p} - SG_{j,p} \right) \right]$$

where:

Em$_j$ is total emissions for gas type (***j***), being methane and carbon dioxide from all well completions and well workovers during a year in a basin, measured in CO_2-e tonnes.

EV$_p$ is the volume of methane flowback during a well completion or well workover from strata for each well (***p***) in cubic metres at standard conditions, worked out in accordance with subsection (5).

SG$_{j,p}$ is the volume of gas type (***j***), being methane and carbon dioxide, in cubic metres at standard conditions that is captured or flared for each well (***p***) during the well completion or well workover, estimated in accordance with:

(a) for the volume of the gas—Division 2.3.6; and

(b) for the gas composition—Division 2.3.3.

VIGG$_{j,p}$ is the volume of gas type (***j***), being methane and carbon dioxide, injected into each well (***p***) during the well completion or well workover, worked out in accordance with subsection (6).

W is the total number of well completions and well workovers during a year in the basin.

γ$_j$ is the factor for converting a quantity of gas type (***j***) from cubic metres at standard conditions to CO_2-e tonnes, being:

(a) for methane—$6.784 \times 10^{-4} \times 21$; and

(b) for carbon dioxide—1.861×10^{-3}.

Z is the total number of greenhouse gas types.

(5) For subsection (4), the factor ***EV$_p$*** is worked out using the following formula:

$$T_p \times FRM_{bt} \times PR_p - VI_p$$

where:

FRM$_{bt}$ is the ratio of flowback during well completions and well workovers to the 30 day production rate for the basin (***b***) and the well type combination (***t***), as worked out in accordance with subsection (7).

PR$_p$ is the first 30 days average production flow rate in cubic metres per hour at each well (***p***), estimated in accordance with Division 2.3.6.

T_p is the total number of hours for the reporting year of flowback for the well completion or well workover for each well (***p***) and well type (horizontal or vertical) in a basin.

VI_p is the volume of injected gas in cubic metres at standard conditions that is injected into the well during the well completion or well workover, estimated in accordance with Division 2.3.6.

(6) For subsection (4), ***$VIGG_{j,p}$*** is worked out using the following formula:

$$VI_p \times mol_{j,p}\%$$

where:

$mol_{j,p}$%, for each gas type (***j***), being methane and carbon dioxide, is the gas type's share of one mole of ***VI_p*** expressed as a percentage, estimated in accordance with Division 2.3.6.

VI_p is the volume of injected gas in cubic metres at standard conditions that is injected into the well during the well completion or well workover, estimated in accordance with Division 2.3.6.

(7) For subsection (5), the factor ***FRM_{bt}*** is worked out using the following formula:

$$\frac{\sum_{p=1}^{N} FR_{p(bt)}}{\sum_{p=1}^{N} PR_{p(bt)}}$$

where:

$FR_{p(bt)}$ is the average flow rate for flowback during well completions and well workovers in cubic metres per hour at standard conditions for each basin (***b***) and well type combination (***t***), determined using a digital or analog recording flow metre on the vent line to measure flowback during the well completion or well workover, estimated in accordance with Division 2.3.6.

N is the number of measured well completions or well workovers in the basin.

$PR_{p(bt)}$ is the first 30 days production flow rate in cubic metres per hour for each well (***p***) and well type (***t***) measured in a basin (***b***), estimated in accordance with Division 2.3.6.

(8) For subsection (7), the sampling requirements for the number of well completions or well workovers performed during a year for each basin and well type (horizontal or vertical) are as follows:

(a) if one to 5 well completions or workovers are performed during a year, all wells are to be measured;

(b) if 6 to 50 well completions or workovers are performed during a year, a minimum of 5 wells are to be measured;

(c) if more than 50 well completions or workovers are performed during a year, a minimum of 10% of wells are to be measured.

59 Section 4.99

Omit "regulation 2.04 of the Regulations", substitute "subsection 7A(2) of the Act".

60 Paragraph 5.3(1)(a)

Omit "paragraph (c)", substitute "paragraphs (c) and (d)".

61 Paragraph 5.3(1)(c)

Repeal the paragraph, substitute:

(c) one of the following methods must be used for emissions from the biological treatment of solid waste at the landfill by an enclosed composting activity:

(i) method 1 under section 5.22;

(ii) method 4 under section 5.22AA; and

(d) method 1 under section 5.22 must be used for emissions from the biological treatment of solid waste at the landfill by a composting activity that is not an enclosed composting activity.

62 Section 5.3 (note)

Omit "and no methods 2, 3, or 4 for paragraph (1) (c)".

63 Section 5.9

Repeal the section, substitute:

5.9 Composition of solid waste

(1) For paragraph 5.4A(b), the composition of solid waste received at the landfill during the year must be classified by:

(a) the general waste streams mentioned in subsection 5.10(1); and

(b) the homogenous waste streams mentioned in subsection 5.10A(1).

(2) For each general waste stream received at the landfill during the year, an estimate of tonnage must be provided in accordance with section 5.10.

(3) For the following general and homogenous waste streams there must be a further classification in accordance with section 5.11 showing the waste mix types in each waste stream (expressed as a percentage of the total tonnage of solid waste in the waste stream):

(a) municipal solid waste;

(b) commercial and industrial waste;

(c) construction and demolition waste;

(d) shredder flock.

64 Section 5.10 (heading)

Repeal the heading, substitute:

5.10 General waste streams

65 Subsection 5.10(1)

Omit "subsection 5.9(1), the waste streams", substitute "paragraph 5.9(1)(a), the general waste streams".

66 Subsection 5.10(2)

Repeal the subsection, substitute:

(2) For subsection 5.9(2), the tonnage of each waste stream mentioned in column 1 of the following table must be estimated:

(a) if the operator of the landfill is required, under a law of the State or Territory in which the landfill is located, to collect data on tonnage of waste received at the landfill according to the waste streams set out in column 1—by using that data; or

(b) if paragraph (a) does not apply and the operator of the landfill is able to estimate, in accordance with one of the criteria set out in section 5.5, the tonnage of the waste streams set out in column 1—by using that data; or

(c) if paragraphs (a) and (b) do not apply and there is no restriction on the waste streams that can be received at the landfill—by using the percentage values in columns 2 to 9 for the State or Territory in which the landfill is located for each waste stream in column 1.

Waste streams and estimation of tonnage

Item	Col. 1 Waste stream	Col. 2 NSW %	Col. 3 VIC %	Col. 4 QLD %	Col. 5 WA %	Col. 6 SA %	Col. 7 TAS %	Col. 8 ACT %	Col. 9 NT %
1	Municipal solid waste	31	36	43	26	36	57	43	43
2	Commercial and industrial	42	24	14	17	19	33	42	14
3	Construction and demolition	27	40	43	57	45	10	15	43

67 Subsection 5.10(4)

Repeal the subsection, substitute:

(4) If subsection (3) applies, the tonnage of each waste stream mentioned in column 1 of the following table must be estimated:

(a) if the operator of the landfill is required, under a law of the State or Territory in which the landfill is located, to collect data on tonnage of waste received at the landfill according to the waste streams set out in column 1—by using that data; or

(b) if paragraph (a) does not apply and the operator of the landfill is able to estimate, in accordance with one of the criteria set out in section 5.5, the tonnage of the waste streams set out in column 1—by using that data; or

(c) if paragraphs (a) and (b) do not apply—by using the percentage values in columns 2 to 9 for the State or Territory in which the landfill is located for each waste stream in column 1.

Waste streams and estimation of tonnage

Item	Col. 1 Waste stream	Col. 2 NSW %	Col. 3 VIC %	Col. 4 QLD %	Col. 5 WA %	Col. 6 SA %	Col. 7 TAS %	Col. 8 ACT %	Col. 9 NT %
1	Commercial and industrial waste	61	38	25	23	30	77	74	25
2	Construction and demolition waste	39	62	75	77	70	23	26	75

68 Subsection 5.10(5)

Omit "column 2", substitute "column 1".

69 After section 5.10

Insert:

5.10A Homogenous waste streams

(1) For paragraph 5.9(1)(b), the homogenous waste streams have the characteristics mentioned in subsection (2) and are as follows:

(a) alternative waste treatment residues;

(b) shredder flock;

(c) inert waste.

(2) Homogenous waste streams have the following characteristics:

(a) they are from a single known and verifiable origin, as evidenced by invoices or, if delivery does not involve a commercial transaction, other delivery documentation;

(b) they are not extracted from a general waste stream;

(c) they do not undergo compositional change between generation and delivery to a landfill;

(d) they are delivered in loads containing only the waste mentioned in paragraph (1)(a), (b) or (c).

70 Paragraph 5.11(1)(b)

Omit "paper board", substitute "cardboard".

71 Paragraph 5.11(1)(i)

Omit "(including concrete, metal, plastic and glass)"

72 Subsection 5.11(2) (table item 2)

Omit "paper board", substitute "cardboard".

73 Subsection 5.11(2) (table item 9)

Omit "(including concrete, metal, plastic and glass)".

74 Subsection 5.11(3) (table item 2)

Omit "paper board", substitute "cardboard".

75 Subsection 5.11(3) (table item 9)

Omit "(including concrete, metal, plastic and glass)".

76 Subsection 5.11(3) (example) (table item 2)

Omit "paper board", substitute "cardboard".

77 Subsection 5.11(3) (example) (table item 9)

Omit "(including concrete, metal, plastic and glass)".

78 Section 5.12 (cell at table item 9, column headed "Waste mix type")

Repeal the cell, substitute:

Inert waste

79 Section 5.12 (at the end of the table)

Add:

10	Alternative waste treatment residues	0.08

80 Paragraph 5.14(2)(a)

Repeal the paragraph, substitute:

(a) obtain records of each of the following for the 10 year period ending immediately prior to the reporting year for which the landfill operator selects k values:

(i) mean annual evaporation;

(ii) mean annual precipitation;

(iii) mean annual temperature; and

81 Subsection 5.14(5) (table)

Repeal the table, substitute:

k values for Solid Waste at a Landfill

Item	State or Territory	Waste mix type	k values
1	NSW	Food	0.185
		Paper and cardboard	0.06
		Garden and Green	0.10
		Wood	0.03
		Textiles	0.06
		Sludge	0.185
		Nappies	0.06
		Rubber and Leather	0.06

k values for Solid Waste at a Landfill			
Item	**State or Territory**	**Waste mix type**	**k values**
		Alternative waste treatment residue	0.06
2	VIC, WA, SA, TAS, ACT	Food	0.06
		Paper and cardboard	0.04
		Garden and Green	0.05
		Wood	0.02
		Textiles	0.04
		Sludge	0.06
		Nappies	0.04
		Rubber and Leather	0.04
		Alternative waste treatment residue	0.04
3	QLD, NT	Food	0.4
		Paper and cardboard	0.07
		Garden and Green	0.17
		Wood	0.035
		Textiles	0.07
		Sludge	0.4
		Nappies	0.07
		Rubber and Leather	0.07
		Alternative waste treatment residue	0.07

82 Subsection 5.14(6) (first occurring) (table)

Repeal the table, substitute:

k values for Solid Waste at a Landfill			
Item	**Landfill classification**	**Waste mix type**	**k values**
1	Temperate dry	Food	0.06
		Paper and cardboard	0.04
		Garden and Green	0.05
		Wood	0.02
		Textiles	0.04
		Sludge	0.06
		Nappies	0.04
		Rubber and Leather	0.04
		Alternative waste treatment residue	0.04
2	Temperate wet	Food	0.185
		Paper and cardboard	0.06
		Garden and Green	0.10

k values for Solid Waste at a Landfill			
Item	**Landfill classification**	**Waste mix type**	**k values**
		Wood	0.03
		Textiles	0.06
		Sludge	0.185
		Nappies	0.06
		Rubber and Leather	0.06
		Alternative waste treatment residue	0.06
3	Tropical dry	Food	0.085
		Paper and cardboard	0.045
		Garden and Green	0.065
		Wood	0.025
		Textiles	0.045
		Sludge	0.085
		Nappies	0.045
		Rubber and Leather	0.045
		Alternative waste treatment residue	0.045
4	Tropical wet	Food	0.4
		Paper and cardboard	0.07
		Garden and Green	0.17
		Wood	0.035
		Textiles	0.07
		Sludge	0.4
		Nappies	0.07
		Rubber and Leather	0.07
		Alternative waste treatment residue	0.07

83 Subsection 5.14(6) (second occurring)

Renumber as subsection (7).

84 Subsection 5.14(6) (second occurring)

Insert:

Bureau of Meteorology Guideline means the document titled *Guidelines for the Siting and Exposure of Meteorological Instruments and Observing Facilities* (Observation Specification No. 2013.1), published by the Bureau of Meteorology in January 1997.

Note: The Bureau of Meteorology Guideline is available at www.bom.gov.au.

85 Subsection 5.14(6) (second occurring) (definition of *mean annual evaporation*)

Repeal the definition, substitute:

mean annual evaporation means the mean annual evaporation:

(a) recorded at the landfill by a meteorological station that is established and maintained in accordance with the Bureau of Meteorology Guideline; or

(b) if paragraph (a) does not apply—recorded by a Bureau of Meteorology weather station that:

(i) is located nearest to the landfill; and

(ii) records mean annual evaporation.

86 Subsection 5.14(6) (second occurring) (definition of *mean annual precipitation*)

Repeal the definition, substitute:

mean annual precipitation means the mean annual precipitation:

(a) recorded at the landfill by a meteorological station that is established and maintained in accordance with the Bureau of Meteorology Guideline; or

(b) if paragraph (a) does not apply—recorded by a Bureau of Meteorology weather station that:

(i) is located nearest to the landfill; and

(ii) records mean annual precipitation.

87 Subsection 5.14(6) (second occurring) (definition of *mean annual temperature*)

Repeal the definition, substitute:

mean annual temperature means the mean annual temperature:

(a) recorded at the landfill by a meteorological station that is established and maintained in accordance with the Bureau of Meteorology Guideline; or

(b) if paragraph (a) does not apply—recorded by a Bureau of Meteorology weather station that:

(i) is located nearest to the landfill; and

(ii) records mean annual temperature.

88 Section 5.14A (cell at table item 9, column headed "Waste mix type")

Repeal the cell, substitute:

Inert waste

89 Section 5.14A (at the end of the table)

Add:

10	Alternative waste treatment residues	0.50

90 Subsection 5.15(3)

Omit "0.85", substitute "the collection efficiency amount for the landfill calculated in accordance with section 5.15C".

91 Subsection 5.15(4)

Repeal the subsection, substitute:

(4) For subsection (1), if:

$$\frac{\gamma\left(Q_{cap} + Q_{flared} + Q_{tr}\right)}{CH_{4gen}}$$

is more than the collection efficiency amount for the landfill calculated in accordance with section 5.15C, then:

$$CH_{4\ z}^{*} = \gamma\left(Q_{capz} + Q_{flaredz} + Q_{trz}\right) \times \left(\frac{1}{CEA}\right)$$

where:

γ is the factor $6.784 \times 10^{-4} \times 21$ converting cubic metres of methane at standard conditions measured to CO_2-e tonnes.

CEA is the collection efficiency amount for the landfill calculated in accordance with section 5.15C.

$\boldsymbol{CH_{4\ z}^{*}}$ is the estimated quantity of methane in landfill gas generated by the sub-facility zone during the year, measured in CO_2-e tonnes.

$\boldsymbol{CH_{4gen}}$ is the quantity of methane in landfill gas generation released from the landfill during the year, estimated in accordance with subsection 5.4(5) and measured in CO2-e tonnes.

$\boldsymbol{Q_{cap}}$ is the quantity of methane in landfill gas captured for combustion from the landfill during the year, measured in cubic metres in accordance with Division 2.3.6.

$\boldsymbol{Q_{capz}}$ is the quantity of methane in landfill gas captured for combustion by the landfill from a sub-facility zone during the reporting year, measured in cubic metres in accordance with Division 2.3.6.

$\boldsymbol{Q_{flared}}$ is the quantity of methane in landfill gas flared from the landfill during the year, measured in cubic metres in accordance with Division 2.3.6.

$\boldsymbol{Q_{flaredz}}$ is the quantity of methane in landfill gas flared by the landfill from a sub-facility zone during the reporting year, measured in cubic metres in accordance with Division 2.3.6.

$\boldsymbol{Q_{tr}}$ is the quantity of methane in landfill gas transferred out of the landfill during the year, measured in cubic metres in accordance with Division 2.3.6.

$\boldsymbol{Q_{trz}}$ is the quantity of methane in landfill gas transferred out of the landfill from a sub-facility zone during the reporting year, measured in cubic metres in accordance with Division 2.3.6.

92 Subsection 5.15(5)

Omit "than 0.85", substitute "than the collection efficiency amount for the landfill calculated in accordance with section 5.15C".

93 Subsection 5.15A(1)

Omit "0.85", substitute "the collection efficiency amount for the landfill calculated in accordance with section 5.15C".

94 Subsection 5.15A(3) (note 2)

Omit "0.85" (wherever occurring), substitute "the collection efficiency amount for the landfill calculated in accordance with section 5.15C".

95 Subsection 5.15B(1)

Omit "0.85", substitute "the collection efficiency amount for the landfill calculated in accordance with section 5.15C".

96 At the end of Subdivision 5.2.3.1

Add:

5.15C Equation—collection efficiency limit at landfill in particular reporting year

(1) Subject to subsection (2), the collection efficiency limit for a landfill is calculated using the following formula:

$$\frac{(A3 \times 60\% + A4 \times 75\% + A5 \times 95\%)}{(A2 + A3 + A4 + A5)}$$

where:

A2 is the area of the landfill in square metres, regardless of cover type, without active gas collection.

A3 is the area of the landfill in square metres that has daily soil cover and active gas collection.

A4 is the area of the landfill in square metres that has active gas collection and:

(a) a top cover that is an intermediate type; or

(b) a final cover of clay that is less than 1 metre thick; or

(c) a phytocap layer that is at least 1 metre thick.

A5 is the area of the landfill in square metres that has active gas collection and:

(a) a final cover of clay that is at least 1 metre thick; or

(b) a geo-membrane cover system.

(2) Where a landfill operator is unable to specify the areas for the factors A2, A3, A4 and A5 in subsection (1), the collection efficiency limit for the landfill is calculated using the following formula:

$$\text{Area of landfill in square metres with active gas collection} \times 75\%$$

97 Paragraphs 5.17A(g) and (h)

Repeal the paragraphs, substitute:

(g) is confined on:

(i) 4 sides by low permeability barriers, including:

(A) capped areas; or

(B) a landfill cell lining; or

(C) if the representative zone does not have a landfill cell lining—a demonstrated low gas permeability strata; or

(ii) 3 sides by low permeability barrier and one side by an active gas collection system; and

98 Subsection 5.18(2)

Repeal the subsection, substitute:

(2) In applying method 2 under section 5.15, the gas flow rate must be estimated from sampling undertaken during the year in accordance with USEPA Method 2E—*Determination of landfill gas production flow rate*, as set out in Appendix A-1 of Title 40, Part 60 of the Code of Federal Regulations, United States of America, or an equivalent Australian or international standard.

99 Section 5.22

Repeal the section, substitute:

5.22 Method 1—emissions of methane and nitrous oxide from biological treatment of solid waste at a landfill

(1) For subparagraph 5.3(1)(c)(i) and paragraph 5.3(1)(d), method 1 is:

$$E_{ij} = \left(M_i \times EF_i\right) - R$$

where:

EF**$_i$* is the emission factor for each gas type (j***), being methane or nitrous oxide, released from the biological treatment type (***i***) measured in tonnes of CO_2-e per tonne of waste processed.

E**$_{ij}$* is the emissions of the gas type (j***), being methane or nitrous oxide, released from the landfill during the year from the biological treatment type (***i***) measured in CO_2-e tonnes.

M**$_i$* is the mass of waste treated by biological treatment type (i***) during the year measured in tonnes of waste.

R is:

(a) for the gas type methane—the total amount of methane recovered during the year at the landfill from the biological treatment of solid waste measured in tonnes of CO_2-e; or

(b) for the gas type nitrous oxide—zero.

(2) For ***EF**$_i$* in subsection (1), the emission factor for each gas type released from the biological treatment type is set out in the following table:

Emission factor for type of gas and biological treatment			
Item	**Biological treatment**	**Emission factor tonnes CO_2-e/tonne of waste treated**	
		Methane	**Nitrous Oxide**
1	Composting at the landfill	0.016	0.030
2	Anaerobic digestion at the landfill	0.021	0

5.22AA Method 4—biological treatment of solid waste at the landfill

For subparagraph 5.3(1)(c)(ii), method 4 is as set out in Part 1.3.

100 Subsection 5.40(1)

Omit "domestic or commercial", substitute "industrial".

101 Subsection 5.42(9), (cell at table item 3, column headed "Units of measurement")

Repeal the cell, substitute:

tonne of product

102 Subsection 5.42(9) (cell at table item 5, column headed "Units of measurement")

Repeal the cell, substitute:

tonne of product

103 Section 6.1 (note 1)

Omit "2.23", substitute "2.25".

104 Subsection 6.5(1) (definition of Q_i)

Repeal the definition, substitute:

> Q_i is the quantity of fuel type (***i***) consumed during the year estimated in accordance with:
>
> (a) Parts 2.2 (solid fuels), 2.3 (gaseous fuels) and 2.4 (liquid fuels); or
>
> (b) subsection (2) for electricity.

105 Section 7.1

Repeal the section, substitute:

7.1 Application

(1) This Chapter specifies a method of determining scope 2 emissions from the consumption of purchased electricity.

(2) This Chapter applies if the amount of purchased electricity consumed from the operation of a facility during a year that results in scope 2 emissions is more than 20 000 kilowatt hours.

Note: Scope 2 emissions result from activities that generate electricity, heating, cooling or steam that is consumed by a facility but that do not form part of the facility (see regulation 2.24 of the Regulations).

106 Paragraph 8.6(1)(c) (table item 1)

Repeal the item, substitute:

1	Bituminous coal	28	5
1A	Sub-bituminous coal	28	5
1B	Anthracite	28	5

107 Part 6 of Schedule 1 (table)

Repeal the table, substitute:

Indirect (Scope 2) Emissions Factors from Consumption of Purchased Electricity from Grid		
Item	**State, Territory or grid description**	**Emission factor kg CO_2-e/kWh**
77	New South Wales and Australian Capital Territory	0.87
78	Victoria	1.17
79	Queensland	0.82
80	South Australia	0.62
81	South West Interconnected System in Western Australia	0.78
82	Tasmania	0.20
83	Northern Territory	0.69

108 Schedule 2 (table item 1)

Repeal the item, substitute:

1	Bituminous coal	Energy content factor	AS 1038.5—1998	Monthly sample composite
		Carbon	AS 1038.6.1—1997 AS 1038.6.4—2005	Monthly sample composite
		Moisture	AS 1038.1—2001 AS 1038.3—2000	Each delivery
		Ash	AS 1038.3—2000	Each delivery
1A	Sub-bituminous coal	Energy content factor	AS 1038.5—1998	Monthly sample composite
		Carbon	AS 1038.6.1—1997 AS 1038.6.4—2005	Monthly sample composite
		Moisture	AS 1038.1—2001 AS 1038.3—2000	Each delivery
		Ash	AS 1038.3—2000	Each delivery
1B	Anthracite	Energy content factor	AS 1038.5—1998	Monthly sample composite
		Carbon	AS 1038.6.1—1997 AS 1038.6.4—2005	Monthly sample composite

	Moisture	AS 1038.1—2001 AS 1038.3—2000	Each delivery
	Ash	AS 1038.3—2000	Each delivery

109 Schedule 3, Part 1 (table item 1)

Repeal the item, substitute:

1	Bituminous coal	0.663
1A	Sub-bituminous coal	0.515
1B	Anthracite	0.712