Carbon Credits (Carbon Farming Initiative) (Reforestation by Environmental or Mallee Plantings—FullCAM) Methodology Determination 2024

I, Josh Wilson, Assistant Minister for Climate Change and Energy, make the following Determination.

Dated 18 November 2024

Josh Wilson
Assistant Minister for Climate Change and Energy

Contents

Part 1—Preliminary

1 Name

This instrument is the *Carbon Credits (Carbon Farming Initiative) (Reforestation by Environmental or Mallee Plantings—FullCAM) Methodology Determination 2024*.

2 Commencement

(1) Each provision of this determination specified in column 1 of the table commences, or is taken to have commenced, in accordance with column 2 of the table. Any other statement in column 2 has effect according to its terms.

Commencement information		
Column 1	**Column 2**	**Column 3**
Provisions	**Commencement**	**Date/Details**
1. The whole of this determination	The day after this instrument is registered.	

Note: This table relates only to the provisions of this determination as originally made. It will not be amended to deal with any later amendments of this determination.

(2) Any information in column 3 of the table is not part of this determination. Information may be inserted in this column, or information in it may be edited, in any published version of this determination.

3 Authority

This determination is made under subsection 106(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

4 Duration

This determination remains in force for the period that:

(a) begins when this determination commences; and

(b) ends on the day before this determination would otherwise be repealed under subsection 50(1) of the *Legislation Act 2003*.

5 Definitions

Note: A number of expressions used in this determination are defined in section 5 of the Act, including the following:

(a) certificate of entitlement;

(b) eligible offsets project;

(c) permanence period;

(d) project area.

In this determination:

above-ground biomass means all live material in a tree or shrub above the soil substrate and includes the stem and crown.

Act means the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

actual plot location means spatial coordinates, collected in the field using a geographic positioning system, which define the locations of plots.

adjacent tree means a non-project tree that:

(a) has a stem in an adjoining area; and
(b) has a crown that extends 3 metres or more across at its widest point, at the time of FullCAM modelling.

adjoining area means the area that extends outwards for 20 metres perpendicular to the long axis of each side of a narrow or wide linear planting as measured from the outer stems of the planting.

below-ground biomass means all live material in a tree or shrub below the soil substrate and includes the tap root or lignotuber, and the lateral roots.

belt planting means a planting that:

(a) is established in a belt configuration;
(b) can follow landscape contours or be arranged in a straight line; and
(c) is either a narrow or wide linear planting.

block planting—see section 23.

calibration means a calibration used in FullCAM.

carbon estimation area or ***CEA*** means an area of land that is within a project area and that meets the requirements in section 13.

carbon pool means a reservoir which has the capacity to accumulate or release carbon, and includes any above-ground biomass, below-ground biomass and debris.

carbon stock of an area of land, at a specified time, means the quantity of carbon held within the area at that time as:

(a) above-ground biomass;
(b) below-ground biomass; and
(c) debris.

carbon stock change means the change in the quantity of carbon stock over a specified time, expressed in units of mass.

CFI Mapping Guidelines means the guidelines of that name, as published on the Department's website and as in force from time to time.

CFI methodology determination means a legislative instrument made under section 106 of the Act or as varied under section 114 of the Act.

CO_2-e means carbon dioxide equivalent.

crown cover means the area of land circumscribed by the outer limits of the crown (viewed as a horizontal cross-section) of a tree, or collection of trees.

debris means above-ground and below-ground dead plant material.

declaration date means the date on which the declaration of a project as an eligible offsets project under section 27 of the Act takes effect.

Note: The declaration date is different from the planting date and modelling commencement date.

disturbance event means an event, whether natural or caused by humans, that affects the accumulation or loss of carbon stock within the boundaries of a project area.

domain group means a set of:

(a) planting types—see Division 5 of Part 3;
(b) planting geometries—see Division 6 of Part 3;
(c) planting spacing—see Division 6 of Part 3; and
(d) if relevant, stocking density—see Division 7 of Part 3;

that taken together define the requirements under which a particular calibration may be applied.

establishment means the act of establishing a mixed-species environmental planting or mallee planting and as a minimum involves the planting of species eligible under this determination.

exclusion area—see section 17.

forest means land of a minimum area of 0.2 hectares on which trees:

(a) have attained, or have the potential to attain, a crown cover of at least 20% across the area of land; and
(b) have reached, or have the potential to reach, a height of at least 2 metres.

forest cover—land has ***forest cover*** if the vegetation on the land includes trees that:

(a) are 2 metres or more in height; and
(b) provide crown cover of at least 20% of the land.

forest potential—land has ***forest potential*** if:

(a) the land has an area of at least 0.2 hectares; and
(b) the vegetation on the land includes trees that have the potential:
    (i) to reach 2 metres or more in height; and
    (ii) to provide crown cover of at least 20% of the land.

fuel emissions means emissions of carbon dioxide (CO_2), nitrous oxide (N_2O), or methane (CH_4) arising from fossil fuel use in implementing the reforestation project.

FullCAM means:

(a) the version of the Full Carbon Accounting Model, as published on the Department's website, that applies in relation to a reforestation project in accordance with the FullCAM Guidelines; or

(b) if the FullCAM Guidelines do not indicate which version applies in relation to a reforestation project, the latest version of the Full Carbon Accounting Model, as published on the Department's website.

FullCAM Guidelines means the guidance for using FullCAM for this determination, as published on the Department's website and as in force from time to time.

GIS means a geographic information system designed to capture, store, manipulate, analyse, manage, and present all types of geographical data.

initial carbon stock means carbon stock existing at the declaration date.

intended plot location means the spatial coordinates for a randomly-selected grid intersect from a GIS overlay used to define the proposed location of plots—see section 33.

known weed species has the meaning given in section 20AA of the *Carbon Credits (Carbon Farming Initiative) Rule 2015*.

land management regime means the set of actions, including:

(a) preparation prior to planting;
(b) planting;
(c) thinning;
(d) weed control treatment; and
(e) the application of fertiliser;

which are applied in a uniform or consistent manner to an area of land.

landscape planting means a planting in an urban centre or locality as follows:

(a) in a residential place (for example, in a backyard, park or on a nature strip);
(b) on the grounds of a sporting facility, factory or other commercial facility;
(c) on the grounds of a hospital, school or other institution;
(d) in a carpark or cemetery.

mallee calibration means a calibration described as a mallee calibration in the FullCAM Guidelines.

mallee planting—see subsection 19(1).

mallee species means any of the Australian species of the genus *Eucalyptus* that generally exhibit a growth form of multiple stems arising from a large underground lignotuber.

Note: Eucalyptus species recognised as having the form of a mallee include:

E. calycogona

E. cneorifolia [Kangaroo Island CS20275]

E. cyanophylla [Loxton cult.]

E. dumosa

E. gracilis [Loxton cult.]

E. horistes

E. incrassata

E. kochii

E. kochii ssp. borealis

E. kochii ssp. plenissima

E. leptophylla

E. loxophleba ssp. lissophloia

E. oleosa

E. plenissima

E. polybractea

E. porosa

E. socialis.

management action means any land management activity that impacts a project area, including but not limited to activities that can be modelled in FullCAM.

mixed-species calibration means a calibration described as a mixed-species calibration in the FullCAM Guidelines.

mixed-species environmental planting—see subsections 20(1) and (2).

model point means a static location defined by latitude and longitude coordinates for each CEA for the purpose of estimating carbon stocks using FullCAM.

modelling commencement means the commencement date used for modelling forest growth in FullCAM, and is the planting date for each CEA.

narrow linear planting—see section 21.

net abatement amount, for a reforestation project, means the carbon dioxide equivalent net abatement amount for the project in the reporting period for the purposes of paragraph 106(1)(c) of the Act.

NGER Measurement Determination means the applicable determination made under subsection 10(3) of the *National Greenhouse and Energy Reporting Act 2007*.

NGER Regulations means the *National Greenhouse and Energy Reporting Regulations 2008*.

permanent planting means a planting:

(a) that is not harvested other than:
  (i) for thinning; or
  (ii) to remove debris for fire management; or
  (iii) in accordance with section 50; and
(b) that is not a landscape planting.

planting means:

(a) as a verb, to put or set in the ground species that are eligible under this determination using:
  (i) tube-stock; or
  (ii) direct seeding, including in rows or broadcast;
  for the purposes of growing project trees;
(b) as a noun, an area of project trees established using direct seeding or tube-stock.

planting date means, for a CEA, the date on which planting last occurred within the CEA.

planting geometry means one of the following:

(a) narrow linear planting;
(b) wide linear planting;
(c) block planting.

planting spacing means the spatial configuration of a planting type and is one of the components that defines a domain group.

planting type is one of the components that defines a domain group and means one of the following:

(a) a mallee planting;
(b) a mixed-species environmental planting.

plot means a defined area of land within a CEA where on-ground samples are collected or for which imagery is analysed.

probable limit of error means a measure of precision estimated as half the confidence interval expressed as a percentage of the estimate calculated here in accordance with Equation 4 for a probability of 0.05 of obtaining a value as or more extreme than the estimate for the two-tailed student's *t* distribution.

project tree means a tree or shrub that has been established within a CEA through undertaking a reforestation project.

random planting means a planting not planted in rows.

reforestation management plan—see section 54.

reforestation project—see section 7.

shrub means a perennial plant that:

(a) has primary supporting structures consisting of secondary xylem; and
(b) has a growth habit that does or would preclude the stem diameter being measured at breast height (DBH) where DBH is 130cm.

stem means the ascending axis of a plant and the main structural component of the above-ground portion of trees and shrubs.

Note: Multi-stemmed trees or shrubs are treated as a single plant for estimating stocking density.

stocking density means the number of live individual trees and shrubs per hectare in a CEA or the number of live individual seedlings and seeds per hectare at establishment.

stratification means the division of a project area into one or more CEAs and, if required, exclusion areas.

thinning means the selective removal of trees for ecological purposes, including to maintain species diversity or ground cover.

tree means a perennial plant that:

(a) has primary supporting structures consisting of secondary xylem; and
(b) has a growth habit that does or will allow the stem diameter to be measured at breast height (DBH) where DBH is 130cm.

wide linear planting—see section 22.

6 Factors and parameters from external sources

(1) If a calculation in this determination includes a factor or parameter that is defined or calculated by reference to another instrument or writing, the factor or parameter to be used for a reporting period is the factor or parameter referred to in, or calculated by reference to, the instrument or writing as in force at the end of the reporting period.

(2) Subsection (1) does not apply if:

(a) this determination specifies otherwise; or
(b) it is not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

Part 2—Reforestation by environmental or mallee plantings projects

7 Reforestation by environmental or mallee plantings projects

(1) For the purposes of paragraph 106(1)(a) of the Act, this determination applies to an offsets project if the project involves the establishment of a permanent planting that could reasonably be expected to result in eligible carbon abatement.

(2) A project covered by subsection (1) is a ***reforestation project***.

Part 3—Project requirements

Division 1—General

8 Operation of this Part

For the purposes of paragraph 106(1)(b) of the Act, this Part sets out requirements that must be met for a reforestation project to be an eligible offsets project.

Division 2—Types of plantings

9 Permanent planting types

The reforestation project must establish by planting, and maintain, permanent plantings that are:

(a) all mixed-species environmental plantings; or
(b) all mallee plantings; or
(c) a combination of mixed-species environmental plantings and mallee plantings provided only one of these types of plantings occurs in each carbon estimation area.

Division 3—Land and location

10 Land on which project is implemented

(1) The reforestation project must be implemented on land that is:

(a) within Australia, excluding external territories; and
(b) in an area for which FullCAM data exists.

(2) The land must not contain woody biomass or an invasive native scrub species that need to be cleared for planting to occur, other than known weed species required or authorised by law to be cleared.

(3) For at least 5 years before the date of the application under section 22 of the Act in relation to the reforestation project, the project area must have been:
  (a) clear of forest cover; or
  (b) clear of forest cover apart from known weed species which were cleared as required by law during that 5-year period.

(4) Project trees established on land on which a reforestation project is to be implemented must have, to the satisfaction of the Regulator, the potential to attain forest cover.

Note: The potential to attain forest cover may be demonstrated by a description of the species of trees to be planted, the growth characteristics of the species and the anticipated height and crown cover across the stratum area when project trees are at maturity. This information is required to be included in the reforestation management plan, and a copy of that plan is required in each offsets report. See paragraphs 54(3)(e), 73(h) and 74(f).

11 Project area

The boundaries of each project area must be identified in accordance with the CFI Mapping Guidelines.

Division 4—Stratification of project area

12 Initial stratification of project area

Before submitting the first offsets report for the reforestation project, the project proponent must stratify each project area in accordance with this Division.

13 Requirements for carbon estimation areas

(1) A CEA must:
  (a) consist of land on which the reforestation project is implemented in accordance with section 10; and
  (b) be mapped in accordance with the CFI Mapping Guidelines.

(2) A CEA must:
  (a) have similar site characteristics in relation to the following:
    (i) soil type;
    (ii) aspect;
    (iii) slope; and
  (b) consist of:
    (i) a single area of land; or
    (ii) areas of land that are not separated by more than 250 metres; and
  (c) contain a model point:
    (i) within the boundaries of the CEA; and
    (ii) in a location representative of the CEA.

14 CEA boundaries

(1) This section sets out requirements for the boundaries of CEAs.

(2) In addition to the requirements in subsections (3), (4) and (5), the boundaries of each CEA must be defined in accordance with the CFI Mapping Guidelines.

(3) If the plantings in a CEA are established in accordance with a narrow or wide linear planting geometry:
(a) the boundary parallel to the long axis of the planting must be one metre beyond the outer row of stems; and
(b) the boundary parallel to the short axis of the planting must be one metre beyond the outer stems of the plants at the end of the rows; and
(c) the boundary circumscribing an exclusion area within a CEA must be one metre beyond the outer stems bordering the exclusion area.

(4) If the plants in a CEA are established in any planting geometry that is not consistent with a narrow or wide linear planting geometry:
(a) the outer boundary of the CEA is immediately outside the stems of the outermost plants; and
(b) the boundary surrounding any exclusion area within a CEA is immediately outside the stems of the plants bordering the exclusion area.

(5) If the plantings in a CEA are established:
(a) in any planting geometry that is not consistent with a narrow or wide linear planting; and
(b) the boundary of the CEA was defined in accordance with another CFI methodology determination for which an offsets report has been submitted and accepted by the Regulator;

then, subject to still meeting the requirements of sections 13 and 18, the existing CEA boundary may be used.

(6) The boundaries of each CEA must be defined in each offsets report submitted to the Regulator in which the CEA is described as a CEA.

15 Maximum permitted CEA width

The maximum permitted width for a CEA is the value determined in accordance with sections 21 to 27.

16 CEA planting requirements

(1) A CEA must contain either:
(a) a mixed-species environmental planting; or
(b) a mallee planting.

(2) Only one calibration may be applied to a CEA in a reporting period.

(3) The planting in the CEA must have:
(a) forest potential at the time of planting; and
(b) continue to have forest potential for at least 12 months after the planting date.

17 Requirements for an exclusion area

Land in each project area on which permanent plantings are not to be established must be defined and mapped as an exclusion area in accordance with the CFI Mapping Guidelines.

18 Re-stratification of a CEA

(1) A CEA may be re-stratified only as provided in this section.

(2) A CEA must be re-stratified if one or more of the following occurs:
  (a) the site characteristics in the area are no longer similar;
  (b) the land management regime ceases to be similar across the area;
  (c) parts of a planting within the area fail to achieve forest potential;
  (d) 5% or more of the CEA loses forest cover or fails to achieve forest potential because of a disturbance event;
  (e) a different calibration is to be applied to part of an existing CEA—in which case the existing CEA may be re-stratified according to where the different calibrations are to be applied.

(3) If a CEA is re-stratified:
  (a) the reforestation management plan must be updated as soon as practicable following the re-stratification; and
  (b) the new boundaries must be identified in the next offsets report that is submitted to the Regulator following the re-stratification.

(4) If the reforestation project is carried out in an area previously defined as an exclusion area, the area may be re-stratified as a CEA.

Division 5—Domain group—planting types and requirements

Note: ***Domain group*** is defined in section 5, and restricts the circumstances in which a particular calibration may be applied. Additional restrictions on the use of some calibrations may arise due to competition from adjacent trees as determined by Division 9.

19 Mallee plantings

(1) A mallee planting is a planting that consists only of mallee species.

(2) A mallee planting may use a calibration only if using it is consistent with the FullCAM Guidelines.

20 Mixed-species environmental plantings

(1) A mixed-species environmental planting is a planting that consists of a mixture of trees and shrubs that:
  (a) are native to the local area of the planting; and
  (b) are sourced from seeds:
    (i) from within the natural distribution of the species; and

(ii) that are appropriate to the biophysical characteristics of the area of the planting; and

(c) are established through planting.

(2) A mixed-species environmental planting may consist of a mixture of trees and shrubs that reflects the structure and composition of the local native vegetation community.

(3) A mixed-species environmental planting may use a calibration only if using it is consistent with the FullCAM Guidelines.

(4) A mixed-species environmental planting must not use a mallee calibration.

Division 6—Domain group—planting geometry and spacing

21 Narrow linear plantings

A narrow linear planting is a planting that consists of:

(a) for a mallee planting—a belt planting that:
  (i) has a maximum width of 2 rows; and
  (ii) is planted from tube-stock or direct seeding, or both; and
  (iii) has a stocking density of at least 800 stems per hectare; and
  (iv) meets the requirements of section 19;

(b) for a mixed-species environmental planting—a planting that has a stocking density of at least 800 stems per hectare and:
  (i) has a maximum width of 2 rows, is planted from tube-stock or direct seeding, or both, and meets the requirements of section 20; or
  (ii) is established randomly using tube-stock or broadcast seeding, or both (and not established in a mix of rows and random plantings); and meets the requirements of section 20.

22 Wide linear plantings

A wide linear planting is a planting that consists of:

(a) for a mallee planting—a belt planting that:
  (i) has a maximum width of 40 metres; and
  (ii) is planted from tube-stock or direct seeding, or both; and
  (iii) has a stocking density of at least 800 stems per hectare; and
  (iv) meets the requirements of section 19;

(b) for a mixed-species environmental planting—a planting that has a stocking density of at least 800 stems per hectare and:
  (i) has a maximum width of 40 metres; and
  (ii) is established in rows using tube-stock or direct seeding, or both, or randomly using tube-stock or broadcast seeding, or both; and
  (iii) meets the requirements of section 20.

23 Block planting

A block planting is any planting that does not meet the requirements of a:

(a) narrow linear planting; or
(b) wide linear planting;

and which:

(c) meets the requirements specified in section 27; and
(d) does not consist of a single row.

24 Mallee plantings—plant spacing

(1) This section specifies the plant spacing of a narrow or wide linear planting for a mallee planting.

(2) The distance between stems within a planting and between rows must be 6 metres or less.

(3) The distance between the stems of the trees in the outermost rows in the planting must be at least 40 metres from the stems of any adjacent planting in the project area.

(4) The planting must not be affected by material competition from adjacent trees as determined by Division 9.

25 Mixed-species environmental plantings—narrow linear plant spacing

(1) This section specifies the plant spacing of a narrow linear planting for a mixed-species environmental planting.

(2) The distance between stems within a planting and between rows must be 6 metres or less.

(3) The distance between:

(a) for random plantings—the stems of the outermost trees or shrubs on one side of the planting to that of the stems of the outermost trees or shrubs on the other side of the planting, must be less than or equal to 20 metres;
(b) for other plantings—the outermost row on one side of the planting to that of the outermost row on the other side of the planting, must be less than or equal to 20 metres.

(4) The distance between the stems of trees or shrubs at the outermost edge of the planting must be at least 40 metres from the stems of another planting in the project area.

(5) The planting must not be affected by material competition from adjacent trees as determined by Division 9.

26 Mixed-species environmental plantings—wide linear plant spacing

(1) This section specifies the plant spacing of a wide linear planting in a mixed-species environmental planting.

(2) The distance between stems within a planting and between rows must be 6 metres or less.

(3) The distance between:
(a) for random plantings—the stems of the outermost trees or shrubs;
(b) for other plantings—the outermost rows;

must be greater than 20 metres and less than 40 metres.

(4) The distance between the stems of trees or shrubs at the outermost edge of the planting must be at least 40 metres from the stems of another planting in the project area.

(5) The planting must not be affected by material competition from adjacent trees as determined by Division 9.

27 Block planting—plant spacing

For the avoidance of doubt, spacing within and between block plantings must be in accordance with the CFI Mapping Guidelines.

Division 7—Domain group—stocking density

28 Tube-stock—default values

If a CEA is established using tube-stock:
(a) the planting is taken to have a stocking density of 85% of the average number of tube-stock planted per hectare for the CEA for the first 5 years following the planting date; and
(b) stocking density is taken to be less than 500 stems per hectare after 5 years from the planting date.

29 Direct seeding—default values

If a CEA is established using direct seeding, stocking density is taken to be less than 500 stems per hectare.

30 Alternatives to default values

After 2 years from the planting date, a project proponent may choose to sample stocking density to ascertain measured values for relevant CEAs in accordance with sections 31 to 40.

31 Requirements for calibrations

(1) If a calibration in the FullCAM Guidelines requires a sample to determine stocking density, the stocking density sampling and estimation techniques set out in this Division are to be applied.

(2) Subject to subsection (3), a project proponent is only required to estimate the stocking density once over the duration of the crediting period.

(3) If an event occurs that may change the stocking density such that the requirements for the calibration being used may no longer be met, then for the purpose of section 32, the project proponent must remeasure the stocking density in accordance with this Division.

(4) If a calibration in the FullCAM Guidelines does not require sampling to determine stocking density, then for that calibration:
(a) a project proponent is not required to undertake the processes in section 28 or 29; and
(b) the evidence requirements in section 32 do not apply.

32 Evidence of stocking density

If a calibration that requires measurement of stocking density is used in a CEA, the project proponent must be able to demonstrate, to the satisfaction of the Regulator, that a planting in that area meets or exceeds the stocking density requirements for the calibration with information collected in accordance with this Division.

33 Estimating stocking density

(1) Stocking density for a CEA may be estimated by:
(a) counting every tree and shrub, and dividing the total number by the area of the CEA; or
(b) systematic random sampling in accordance with subsection (2).

(2) If systematic random sampling is used to estimate stocking density, intended plot locations must be selected in accordance with section 36.

(3) The methods specified in subsection (1) may be undertaken by:
(a) on-ground measurement; or
(b) using date-stamped, geo-referenced, remotely-sensed imagery.

(4) To estimate stocking density by on-ground measurement:
(a) plots must be established within the CEA at intended plot locations;
(b) each living tree and shrub in the plot must be counted; and
(c) the stocking density for the CEA must be calculated using the calculations specified in Division 8.

(5) To estimate stocking density using date-stamped, geo-referenced, remotely-sensed imagery:

(a) the imagery must have:

(i) a horizontal accuracy that meets the CFI Mapping Guidelines; and

(ii) a pixel resolution of 2.5 metres or better so that individual trees can be differentiated; and

(iii) plots established at each intended plot location selected as specified in subsection (2); and

(b) each living tree and shrub in the plot must be counted; and

(c) the stocking density for the CEA must be calculated using the calculations specified in Division 8.

34 Number of plots and probable limits of error

(1) Subject to subsection (2), if a project proponent undertakes systematic random sampling in a CEA, the project proponent must establish and analyse a minimum of 10 plots in each CEA.

(2) The project proponent must establish and analyse an additional number of plots estimated to achieve a target probable limit of error at the P=0.05 level.

35 Determining values for stocking density

If the probable limit of error for stocking density at the P=0.05 level of significance is:

(a) equal to or less than 10%—then the stocking density for the CEA may be taken to be equal to the mean as calculated by Equation 2;

(b) greater than 10% and equal to or less than 50%—then the stocking density for the CEA may be taken to be equal to the lower confidence limit as calculated by Equation 6; or

(c) greater than 50%—then:

(i) the sampling process must be repeated with an additional grid overlay as specified in section 36; or

(ii) the default stocking density for the planting as specified in section 28 or 29 must be used.

36 Establishing a grid overlay

(1) If a project proponent samples in accordance with section 33, a grid overlay must be established in accordance with this section.

(2) The grid must consist of square cells.

(3) There must be at least 10 grid intersects within each CEA being sampled.

(4) Subject to subsection (5), an anchor point for the grid must be established by:

(a) adopting an anchor point as determined by the requirements of another CFI methodology determination; or

(b) randomly selecting easting and northing coordinates within the ranges of easting and northing coordinates for the project area.

Note: A project may require more than one grid anchor point to be established.

(5) The easting and northing coordinates referred to in subsection (4) must be from the latest version of the Map Grid of Australia or the latest version of any Australian standard that replaces the Map Grid of Australia.

(6) The orientation of one axis of the grid must be along an azimuth determined by randomly selecting a whole number angle within the range of zero and 89 degrees inclusive, where zero degrees is true north.

(7) Each grid intersect must be assigned a unique identifier.

(8) Actual plot locations must be located within 10 metres of each intended plot location.

37 Plot shapes—general

(1) Plots must have:
(a) a fixed orthogonal area; and
(b) a minimum size of 0.01 hectares.

(2) All plots in a CEA must have the same shape.

(3) In this section:

orthogonal area means the area in a horizontal plane, not a sloping plane. Any measurements of length (for example, the length of the side of a rectangular plot) must be the horizontal distance, not the slope distance.

38 Plot shapes—block plantings

(1) If a CEA contains a block planting, the plots must be established in accordance with this section.

(2) The plots must be either circular or rectangular.

(3) A circular plot must be established so that:
(a) the centre of the circular plot is the actual plot location; and
(b) the boundary of the circular plot is defined by the circumference.

(4) A rectangular plot must be established so that the actual plot location is sited at the same relative position in each rectangular plot in the CEA.

(5) In this section:

relative position means the most north-westerly, north-easterly, south-easterly or south-westerly corner of a rectangular plot.

39 Plot shapes—linear plantings

(1) If the CEA contains a narrow or wide linear planting, the plots must be established in accordance with this section.

(2) The plots must have a rectangular shape.

(3) The centre line of the plot must:
(a) be perpendicular to the long axis of the planting; and
(b) pass through the actual plot location.

(4) The centre line between the boundaries of the CEA must be used to measure the plot width.

(5) The distance between the two ends of the plot must be determined by:
(a) dividing the plot area (square metres) by plot width (metres); and
(b) establishing the lines dividing the two ends of the plot parallel to and equidistant from the centre line.

40 Plots extending beyond CEA

(1) Subject to subsection (2), if a plot extends beyond the boundaries of a CEA, only trees and shrubs in the plot that are also within the CEA boundary are permitted to be counted.

Note: For plots that extend beyond a CEA's boundary, only trees and shrubs within the CEA are counted, but for calculation purposes the area of the plot is taken to be the same as for other plots in that CEA.

(2) If the plot has been established in accordance with another CFI methodology determination, the rules pertaining to the treatment of a plot crossing the boundary of a CEA or equivalent under that CFI methodology determination may be applied to the treatment of the plot.

Division 8—Calculating stocking density

41 Calculating stocking density of a plot

The stocking density of a plot must be calculated using the following formula:

$z_{ij} = \frac{S_{ij}}{a_j}$	**Equation 1**

where:

$z_{ij} =$	stocking density (in stems/ha) of the j^{th} plot in the i^{th} carbon estimation area.

$S_{ij} =$	total number of individual living trees and shrubs in the j^{th} plot in the i^{th} carbon estimation area.
$a_j =$	plot area (in hectares).
$i =$	i^{th} carbon estimation area.
$j =$	j^{th} plot.

42 Calculating average stocking density

The average stocking density of a carbon estimation area must be calculated using the following formula:

$\bar{z}_i = \frac{\sum_{j=1}^{M_i} z_{ij}}{M_i}$	**Equation 2**

where:

$\bar{z}_i =$	average stocking density (in stems/ha) for the i^{th} carbon estimation area.
$M_i =$	total number of plots in the i^{th} carbon estimation area.
$z_{ij} =$	stocking density (in stems/ha) of the j^{th} plot in the i^{th} carbon estimation area—see Equation 1.
$i =$	i^{th} carbon estimation area.
$j =$	j^{th} plot.

43 Calculating margin of error for stocking density

(1) The margin of error for the average stocking density of a CEA must be calculated using the following formula:

$E_{\bar{z}i} = t_{0.05} \times \frac{\sigma_{\bar{z}i}}{\sqrt{M_i}}$	**Equation 3**

where:

$E_{\bar{z}i} =$	margin of error for the average stocking density (in stems/ha) for the i^{th} carbon estimation area.
$t_{0.05} =$	critical value of the t-distribution for a student's t-test, using M_i -1 degrees of freedom at the P=0.05 level of significance.

$\sigma_{\bar{z}i} =$	standard deviation of average stocking density ($\bar{z}$) for plots within the i^{th} carbon estimation area.
$M_i =$	total number of plots in the i^{th} carbon estimation area.
$i =$	i^{th} carbon estimation area.

(2) The standard deviation of the average stocking density for plots within the CEA must be calculated using the formula for sample standard deviation using Equation 4 as follows:

$\sigma_{zi} = \sqrt{\frac{1}{M_i - 1}\sum_{i=1}^{M_i}(z_{ij} - \mu_z)^2}$ where $\mu_z = \frac{1}{M_i - 1}\sum_{i=1}^{M_i} z_{ij}$	**Equation 4**

where:

$\sigma_{\bar{z}i} =$	standard deviation of average stocking density ($\bar{z}$) for plots within the i^{th} carbon estimation area.
$\mu_z =$	average of the stocking density z_{ij} for j plots within the i^{th} carbon estimation area.
$z_{ij} =$	stocking density (in stems/ha) of the j^{th} plot in the i^{th} carbon estimation area.
$M_i =$	total number of plots in the i^{th} carbon estimation area.
$i =$	i^{th} carbon estimation area.
$j =$	j^{th} plot.

44 Calculating probable limits of error for stocking density

The probable limit of error for the average stocking density of a CEA must be calculated using the following formula:

$L_{\bar{z},i} = \left(\frac{E_{\bar{z}i}}{\bar{z}_i}\right) \times 100$	**Equation 5**

where:

$L_{\bar{z}\,i} =$	probable limits of error (PLE) for the average stocking density ($\bar{z}$), at the P=0.05 level of significance for the i^{th} carbon estimation area as a percentage.

$E_{\bar{z}i} =$	margin of error for the average stocking density (in stems/ha) for the i^{th} carbon estimation area—see Equation 3.
$\bar{z}_i =$	average stocking density (in stems/ha) for the i^{th} carbon estimation area—see Equation 2.
$i =$	i^{th} carbon estimation area.

45 Calculating conservative estimate of stocking density

The conservative estimate of the average stocking density of a CEA must be calculated as the lower confidence limit using the following formula:

$\tilde{z}_i = \bar{z}_i - \left(t_{0.05} \times \frac{\sigma_{\bar{z},i}}{\sqrt{M_i}} \right)$	**Equation 6**

where:

$\tilde{z}_i =$	conservative estimate of the average stocking density (in stems/ha) within the i^{th} carbon estimation area.
$\bar{z}_i =$	average stocking density (in stems/ha) for the i^{th} carbon estimation area—see Equation 2.
$t_{0.05} =$	critical value of the t-distribution for a student's t-test, using n-1 degrees of freedom at the P=0.05 level of significance.
$\sigma_{\bar{z}i} =$	standard deviation of average stocking density ($\bar{z}$) for plots within the i^{th} carbon estimation area—see Equation 4.
$M_i =$	total number of plots in the i^{th} carbon estimation area.
$i =$	i^{th} carbon estimation area.

Division 9—Narrow or wide linear plantings—competition from adjacent trees

46 Competition from adjacent trees

(1) A narrow or wide linear planting must not be subject to competition from adjacent trees if the competition has a material impact on sequestration in the planting.

(2) A project proponent must determine whether there is material competition from adjacent trees on a narrow or wide linear planting in accordance with this Division.

Note: The presence or absence of adjacent trees may be demonstrated using remotely-sensed imagery dated no earlier than 3 years prior to the planting

date for the planting. A proponent is able to re-stratify in accordance with section 18, to define a CEA such that it is not subject to material competition from adjacent trees.

(3) In this Division:

grouped adjacent trees means a group of adjacent trees where all the stems in the group are less than 20 metres apart.

individual adjacent tree means an adjacent tree that is more than 20 metres from any other adjacent tree.

47 Determining material competition—individual adjacent trees only

(1) Subject to section 48, material competition from individual adjacent trees is taken to be occurring for a narrow or wide linear planting if, on average, there is more than one individual adjacent tree for:

(a) a narrow linear planting—every 150 metres in length of the boundaries parallel to the long axis of the planting; or

(b) a wide linear planting—every 75 metres in length of the boundaries parallel to the long axis of the planting.

48 Determining material competition—grouped adjacent trees

(1) The occurrence of material competition from grouped adjacent trees must be determined in accordance with this section.

Note: Material competition from grouped adjacent trees for a narrow or wide linear planting could occur where there is:

(a) a single occurrence of grouped adjacent trees;

(b) multiple occurrences of grouped adjacent trees; or

(c) either (a) or (b) in combination with individual adjacent trees.

If only individual adjacent trees are present in the adjoining area, the project proponent must determine if material competition is determined in accordance with section 47.

(2) The net length of impact of grouped adjacent trees is estimated in accordance with subsections (3) to (8).

(3) The distance between the outermost stems of each occurrence of grouped adjacent trees must be measured along the long axis of the planting.

(4) The length of impact of each clump must be determined by adding 30 metres to the distance determined in subsection (3).

(5) The length of impact of each occurrence of an individual adjacent tree is taken to be 30 metres.

(6) The gross length of impact of the adjacent trees is determined by adding together the distances specified in subsections (4) and (5) for all grouped and individual adjacent trees.

(7) If the planting is a narrow linear planting where:
(a) there are adjacent trees on opposite sides of a narrow linear planting; and
(b) the length of impact of these adjacent trees overlaps;

then:
(c) the distance of the overlap along the long axis of the planting must be measured; and
(d) the distance determined in paragraph (c) must be halved to give the overlap adjustment; and
(e) the overlap adjustment calculated in paragraph (d) must be subtracted from the gross length of impact determined in subsection (6).

(8) The net length of impact must:
(a) for a narrow linear planting—be the length determined in accordance with subsection (6) and, if relevant, subsection (7); or
(b) for a wide linear planting—be the length determined in accordance with subsection (6).

(9) If the net length of impact of adjacent trees is:
(a) for a narrow linear planting—more than 20% of the length of the long axis of the planting; or
(b) for a wide linear planting—more than 20% of twice the length of the long axis of the planting;

then the adjacent trees are taken to cause material competition for the planting.

Note: Adjacent trees are taken to impact the entire width of a narrow linear planting, but only taken to impact one half of the width of a wide linear planting. Consequently, in paragraph (9)(b) the length of the long axis of the planting is doubled before calculating the impacted percentage of the planting. This means a wide linear planting can effectively have twice as many individual adjacent tree impacts before there is a material impact on sequestration.

Division 10—Restricted activities

49 Harvesting

Biomass must not be removed from a CEA except in accordance with section 50.

50 Permitted biomass removals

(1) Subject to subsection (2), biomass may be harvested:
(a) for thinning; or
(b) to remove debris for fire management; or
(c) in accordance with traditional Indigenous practices or native title rights; or
(d) to remove up to 10% of fallen timber in a calendar year (but only if for personal use); or

(e) to remove seeds, provided no more than 20% of any seeds are harvested from a CEA in a calendar year (whether for personal or commercial use); or

(f) to remove up to 10% of stems, roots or bark from standing or fallen trees to be used for fencing or as craft materials in a calendar year (but only if for personal use).

Note: Thinning is restricted to the selective removal of trees for ecological purposes, including to maintain species diversity or ground cover (see the definition of ***thinning*** in section 5).

(2) Biomass described in subsection (1) must only be harvested if the harvesting will not negatively impact any of the following:

(a) biodiversity;
(b) forest cover;
(c) forest potential;
(d) abatement estimates.

51 Grazing

If grazing occurs in a CEA:

(a) the grazing must not affect the achievement or maintenance of forest cover in the area; and

(b) the Regulator may request evidence that demonstrates that the grazing has not prevented:

(i) the achievement or maintenance of forest cover; and

(ii) compliance with the requirements for stocking density for the calibration used.

Note: Evidence may include date-stamped, geo-referenced, remotely-sensed imagery.

52 Infill planting

(1) If infill planting occurs in a CEA, the plantings that comprise infill planting must consist of only those species described in the project's reforestation management plan for infill planting in that area.

(2) If establishment infill planting occurs in a CEA, the plantings that comprise establishment infill planting:

(a) must not affect the calibration that can be used for the CEA in accordance with this determination;

(b) are not taken to be a planting for the purposes of determining the planting date unless:

(i) they are dominant canopy trees; or

(ii) a high-density mallee calibration is used and the plantings are done to satisfy the requirements to use that calibration.

(3) If ecological infill planting occurs in a CEA, the plantings that comprise ecological infill planting are not taken to be a planting for the purposes of

determining the planting date and must not affect the calibration that can be used for the CEA in accordance with this determination, unless:

(a) more than 5% of the CEA comprises ecological infill planting; and
(b) the ecological infill planting includes mallee plantings,

in which case a mixed-species calibration must be used (except where using that calibration is inconsistent with the FullCAM Guidelines).

(4) In this section:

ecological infill planting means the planting of any trees or shrubs within the bounds of a CEA:

(a) after the first reporting period; and
(b) for the purposes of enhancing the biodiversity outcomes of a reforestation project; and
(c) in circumstances where the planting is not done as part of re-stratification as a result of plantings that have failed to establish.

establishment infill planting means the planting of any trees or shrubs within the bounds of a CEA:

(a) before the end of first reporting period; and
(b) for the purposes of increasing stem density and increasing the forest potential; and
(c) in circumstances where the planting is not done as part of re-stratification as a result of plantings that have failed to establish.

infill planting means establishment infill planting or ecological infill planting.

Division 11—Newness and additionality

53 Requirement in lieu of newness requirement

(1) For the purposes of subparagraph 27(4A)(a)(ii) of the Act, the requirement in lieu of the newness requirement for a reforestation project is that the project has not begun to be implemented, with the exceptions set out in this section.

(2) Disregard the preparation of a reforestation management plan before a management action commences.

(3) Disregard site preparation, planting, and the leasing or purchasing of a tangible asset for the purposes of site preparation or planting, when undertaken:

(a) after a section 22 application has been made in relation to the project but before the date the project is declared an eligible offsets project by the Regulator; or
(b) after a section 29 application has been made in relation to the project but before the date the variation of the section 27 declaration in relation to the project is made by the Regulator.

(4) In this section:

section 22 application, in relation to an offsets project, means an application under section 22 of the Act for the declaration of the project as an eligible offsets project.

section 27 declaration, in relation to an eligible offsets project, means a declaration under section 27 of the Act that the project is an eligible offsets project.

section 29 application, in relation to an area of land, means an application made under regulations or legislative rules made for the purposes of section 29 of the Act to vary the section 27 declaration in relation to a project in relation to the area.

site preparation means any action taken to prepare land for planting, including ripping, tilling, scalping, windrow and burn, fertilisation, weed control, mounding and fencing.

Division 12—Reforestation management plan

54 Requirements for a reforestation management plan

(1) For each reforestation project, the project proponent must create and maintain a reforestation management plan.

(2) A reforestation management plan must accompany a relevant application made under the Act.

Note: Sections 73 and 74 also require a reforestation management plan to be included in the first offsets reports and, if there are changes to the plan, in subsequent offsets reports.

(3) The ***reforestation management plan*** is a document that sets out the following for each area of land that is intended to be established, or has been established, as a CEA, as at a specified date and only if available at that date:
(a) a list of the species planted, or expected to be planted, in carrying out the reforestation project;
(b) a description of the suitability of these species for the area in which they are to be, or are, planted, and how they will remain suitable for the duration of the permanence period (including, but not limited to, the resilience of the species to any expected changes in the local climate);
(c) a description of how each species is, or is intended to be, established;
(d) all information that demonstrates how any plantings fall into a type of planting described in section 19 or 20;
(e) in relation to project trees, a description of the species of trees to be planted, the growth characteristics of the species, the anticipated height and crown cover across all project areas when project trees are at maturity and any other information to show compliance with subsection 10(4);
(f) a description of the species to be used for any infill planting and how the infill planting is established (whether planned, expected or actual);

(g) planting type, geometry, spacing and expected stem density (whether planned, expected or actual);
(h) how the reforestation project will be monitored to ensure compliance with Part 3 and the CFI Mapping Guidelines.

(4) In this section, ***relevant application*** means:
(a) an application under section 22 of the Act for the declaration of the project as an eligible offsets project; or
(b) a request under section 128 of the Act to approve the application of this methodology determination to the project; or
(c) an application for a variation under regulations or legislative rules made under section 29 of the Act that adds eligible land to the project area.

55 Updating a reforestation management plan

If any information of the kind set out in subsection 54(3) is included in a reforestation management plan and becomes out of date or incorrect, the reforestation management plan must be updated as soon as practicable so that it remains up-to-date and correct.

Part 4—Net abatement amount

Division 1—Preliminary

56 Operation of this Part

For paragraph 106(1)(c) of the Act, this Part specifies the method for working out the net abatement amount for a reporting period for a reforestation project that is an eligible offsets project.

Note: In this determination, this is called the ***net abatement amount*** for the project for the reporting period (see section 5).

57 Net abatement amount

The net abatement amount is taken to be the change in total carbon stock for all of the CEAs within all project areas when compared to the baseline, less the project emissions.

58 Gases to be taken into account

When making calculations under this Part:
(a) the carbon pools and emission sources and the corresponding greenhouse gases in the table in Schedule 1 must be taken into account; and

(b) no other gases, carbon pools or emission sources may be taken into account.

59 Baseline for project

(1) The baseline for a reforestation project in relation to a reporting period is the carbon stock that the CEAs for the project would have had in the absence of the project if the land use and management had continued as they were during the baseline period for the project; and

(2) The baseline amount is taken to be zero and is not recalculated during the project.

Division 2—FullCAM modelling

60 FullCAM modelling

FullCAM must be used to model the following parameters for each CEA in accordance with the FullCAM Guidelines:

(a) carbon stock;
(b) emissions resulting from a disturbance event;
(c) the effects of a management action.

61 Modelling scenarios in FullCAM

(1) For each offsets report, the project proponent must create and run the project scenario simulation for each CEA in existence at the end of the reporting period.

(2) Each scenario simulation must be created and run as a FullCAM simulation in accordance with this Division and the FullCAM Guidelines.

Note: The FullCAM Guidelines set out how a management action or disturbance event is to be modelled in terms of FullCAM events.

(3) Each simulation must be created and run in the 90-day period before an offsets report is submitted to the Regulator.

62 Modelling project scenario

The project simulation for a CEA in a reporting period is a FullCAM simulation that:

(a) begins on the day before the planting date; and
(b) ends on the last day of the reporting period; and
(c) simulates all of the management actions and disturbance events recorded in the reforestation management plan and listed in the FullCAM Guidelines as at the end of that reporting period.

Division 3— Calculation of carbon stock change

63 Calculating initial carbon stock for project area

(1) The initial carbon stock for a project area must be calculated in accordance with this section.

(2) The initial carbon stock for a project area is:

(a) if:

(i) the project area was a project area of an eligible offsets project to which this determination or another CFI methodology determination applicable to reforestation projects applied at the declaration date of that reforestation project; and

(ii) the reforestation project commenced in that project area before that date;

equal to the initial carbon stock for the project area calculated in accordance with subsection (3); and

(b) for all other project areas—zero.

(3) For the purposes of paragraph (2)(a), the initial carbon stock for the project area must be calculated using the following formula:

$C_N = \sum_{i=1}^{n_a} C_{Di} \times \frac{44}{12}$	**Equation 7**

where:

$C_N =$	initial carbon stock for the project area (in tonnes CO_2-e).
$C_{Di} =$	initial carbon stock for the i^{th} carbon estimation area at the relevant declaration date, *D* (in tonnes C)—see Equation 9.
$n_a =$	total number of carbon estimation areas in the project area at the relevant declaration date *D*.
$i =$	i^{th} carbon estimation area.

64 Calculating project area carbon stock at end of reporting period

For each reporting period, the carbon stock for the project area is the sum of the carbon stock in each CEA and must be calculated using the following formula:

$C_P = \sum_{i=1}^{n} C_i \times \frac{44}{12}$	**Equation 8**

where:

$C_P =$	carbon stock for the project area at the end of a reporting period (in tonnes CO_2-e).
$C_i =$	carbon stock for the i^{th} carbon estimation area at the end of the current reporting period (in tonnes C)—see Equation 10.
$n =$	total number of carbon estimation areas in the project area at the end of the current reporting period.
$i =$	i^{th} carbon estimation area.

65 Calculating carbon stock for CEA

(1) The initial carbon stock for a CEA must be calculated as the sum of FullCAM outputs for carbon in the tree and debris pools determined in accordance with Division 2, and must be calculated using the following formula:

$C_{Di} = (C_{Ddi} + C_{Dti}) \times a_i$	**Equation 9**

where:

$C_{Di} =$	initial carbon stock for the i^{th} carbon estimation area at the declaration date *D* (in tonnes C).
$C_{Ddi} =$	initial carbon stock in debris for the i^{th} carbon estimation area determined using FullCAM at the declaration date *D* (in tonnes C per hectare).
$C_{Dti} =$	initial carbon stock in trees for the i^{th} carbon estimation area determined using FullCAM at the declaration date *D* (in tonnes C per hectare).
$a_i =$	area of the i^{th} carbon estimation area (in hectares).
$i =$	i^{th} carbon estimation area.

(2) For each reporting period, the carbon stock for a CEA must be calculated as the sum of FullCAM outputs for carbon in the tree and debris pools determined in accordance with Division 2, and must be calculated using the following formula:

$C_i = (C_{di} + C_{ti}) \times a_i$	**Equation 10**

where:

$C_i =$	carbon stock for the i^{th} carbon estimation area at the end of the current reporting period (in tonnes C).

$C_{di} =$	carbon stock in debris for the i^{th} carbon estimation area determined using FullCAM for the final month of the reporting period (in tonnes C per hectare).
$C_{ti} =$	carbon stock in trees for the i^{th} carbon estimation area determined using FullCAM for the final month of the reporting period (in tonnes C per hectare).
$a_i =$	area of the i^{th} carbon estimation area (in hectares).
$i =$	i^{th} carbon estimation area.

Division 4—Calculation of project area emissions

66 Calculating emissions from biomass burning

(1) For each reporting period, emissions of methane (CH_4) for the project area due to biomass burning in the reporting period must be calculated using the following formula:

$$E_{BCH_4} = G_{CH_4} \times \sum_{i=1}^{n} (E_{CH_4 i} \times a_{Bi})$$	**Equation 11**

where:

$E_{BCH_4} =$	emissions of CH_4 from biomass burning for the project area for a reporting period (in tonnes CO_2-e).
$E_{CH_4 i} =$	mass of CH_4 emitted during the reporting period due to biomass burning in the i^{th} carbon estimation area determined using FullCAM (in tonnes per hectare).
$a_{Bi} =$	area burnt in the i^{th} carbon estimation area during the reporting period (in hectares).
$G_{CH_4} =$	global warming potential of methane as specified in the NGER Regulations.
$n =$	total number of carbon estimation areas within the project area at the end of the reporting period.
$i =$	i^{th} carbon estimation area.

(2) For each reporting period, emissions of nitrous oxide (N_2O) for the project area due to biomass burning in the reporting period must be calculated using the following formula:

$E_{BN_2O} = \left(\frac{G_{N_2O}}{1000}\right) \times \sum_{i=1}^{n}\left(E_{N_2Oi} \times a_{Bi}\right)$	**Equation 12**

where:

$E_{BN_2O} =$	emissions of N_2O from biomass burning for the project area for the reporting period (in tonnes CO_2-e).
$E_{N_2Oi} =$	mass of N_2O emitted during the reporting period due to biomass burning in the i^{th} carbon estimation area determined using FullCAM (in kilograms per hectare).
$a_{Bi} =$	area burnt in the i^{th} carbon estimation area during the reporting period (in hectares).
$G_{N_2O} =$	global warming potential of nitrous oxide as specified in the NGER Regulations.
$n =$	total number of carbon estimation areas within the project area at the end of the reporting period.

(3) For each reporting period, total emissions for the project area due to biomass burning in the reporting period must be calculated using the following formula:

$E_B = E_{BCH_4} + E_{BN_2O}$	**Equation 13**

where:

$E_B =$	total emissions from biomass burning for the project area for the reporting period (in tonnes CO_2-e).
$E_{BCH_4} =$	emissions of CH_4 from biomass burning for the project area for the reporting period (in tonnes CO_2-e)—see Equation 11.
$E_{BN_2O} =$	emissions of N_2O from biomass burning for the project area for the reporting period (in tonnes CO_2-e)—see Equation 12.

67 Calculating emissions from fuel use

(1) For each reporting period, emissions from fuel use for the project area must be calculated:

(a) from the end of the previous reporting period to the last month of the current reporting period;

(b) from either:

(i) raw data; or

(ii) estimates for quantities and types of fuel used; and

(c) using Equations 14 and 15.

(2) For each reporting period, the fuel emissions for each fuel type and each greenhouse gas type (carbon dioxide, nitrous oxide and methane) for the reporting period for the project area must be calculated using the following formula:

$E_{fk} = \frac{Q_f \times e_f \times F_{fk}}{1000}$	**Equation 14**

where:

$E_{fk} =$	fuel emissions for fuel type *f* and greenhouse gas *k* for the reporting period for the project area (in tonnes CO_2-e).
$Q_f =$	quantity of fuel type *f* combusted within the reporting period for the project area (in kilolitres).
$e_f =$	energy content factor of fuel type *f*, as prescribed in Schedule 1 of the NGER Measurement Determination (in gigajoules per kilolitre).
$F_{fk} =$	emission factor for gas type *k* for fuel type *f* as prescribed in Schedule 1 to the NGER Measurement Determination (in kilograms CO_2-e per gigajoule).
$f =$	fuel type.
$k =$	type of greenhouse gas (carbon dioxide, methane or nitrous oxide) emitted for a given fuel type.

Note: The relevant energy content and emission factors are included, with worked examples, in the National Greenhouse Accounts Factors available via the Department's website. If is measured in gigajoules, then = 1.

(3) For each reporting period, total emissions from fuel use in the reporting period for the project area must be calculated using the following formula:

$E_F = \sum_{f=1}^{q} \sum_{k=1}^{g} E_{fk}$	**Equation 15**

where:

$E_F =$	total fuel emissions for the project area (in tonnes CO_2-e).
$E_{fk} =$	fuel emissions for each fuel type *f* and each greenhouse gas *k* (in tonnes CO_2-e) for the reporting period for the project area—see Equation 14.

$q =$	number of different types of fuel.
$g =$	number of different types of greenhouse gas emitted for a given fuel type.
$f =$	fuel type.
$k =$	type of greenhouse gas (carbon dioxide, methane or nitrous oxide) emitted for a given fuel type.

Division 5—Calculation of the net abatement amount

68 Calculating the net abatement amount for a project

(1) The net abatement amount for the reporting period for a reforestation project is equal to the sum of the amounts A calculated in accordance with subsection (2) for each project area.

(2) For each reporting period, the net abatement amount for a project area of a reforestation project must be calculated using the following formula:

$A = C_P - E_B - E_F - C_{Prev}$	**Equation 16**

where:

$A =$	Project area net abatement for the reporting period (in tonnes CO_2-e).
$C_P =$	carbon stock for the project area (in tonnes CO_2-e)—see Equation 8.
$E_B =$	total project emissions from biomass burning for the project area (in tonnes of CO_2-e)—see Equation 13.
$E_F =$	total project fuel emissions for the project area (in tonnes CO_2-e) —see Equation 15.
$C_{Prev} =$	(a) for the first reporting period in which the project area has been reported on—the initial carbon stock for the project area C_N (in tonnes CO_2-e) (see subsections 63(2) and (3)); and (b) for a later reporting period—the carbon stock for the project area at the end of the previous reporting period (in tonnes CO_2-e) (see the carbon stock value reported in the previous offsets report).

(3) In this section:

previous offsets report means the most recent report for the project area submitted under this or another CFI methodology determination applicable for a reforestation project and for which a certificate of entitlement has been issued.

Part 5—Monitoring, record-keeping and reporting requirements

Division 1—Preliminary

69 Application

For the purposes of subsection 106(3) of the Act, a project proponent of a reforestation project that is an eligible offsets project must comply with the monitoring, record-keeping and reporting requirements in this Part.

70 Geospatial information requirements

Where this Part requires geospatial information to be created, monitored or reported, a geographic information system that meets the requirements of the CFI Mapping Guidelines must be used in accordance with the CFI Mapping Guidelines to create, monitor or report that information.

Division 2—Monitoring requirements

71 Project monitoring

(1) A project proponent must monitor the reforestation project to:
  (a) ensure compliance with Part 3 and the CFI Mapping Guidelines; and
  (b) if a specific calibration has been used, collect information to demonstrate that the requirements for the use of the specific calibration have been met; and
  (c) identify and record management actions within each project area; and
  (d) identify and record disturbance events within each project area.

(2) A project proponent may use on-ground observation and/or remotely-sensed imagery in order to:
  (a) meet the requirements of subsection (1); and
  (b) collect information to demonstrate that the requirements for the use of a specific calibration have been met.

Division 3—Record-keeping requirements

72 Records that must be kept

A project proponent must create and maintain the following records:

(a) evidence that there was no forest cover in a project area (or no cover apart from known weed species which were cleared as required by law) in the 5 years before the date of the application under section 22 of the Act in relation to the project;
(b) a description of how each CEA was identified;
(c) evidence to justify stratification within each project area, including any of the following:
    (i) planting or management records;
    (ii) satellite imagery;
    (iii) soil, vegetation or landform maps;
    (iv) monitoring records;
(d) evidence of all plant species established within each CEA, including the stocking density at establishment;
(e) date-stamped FullCAM output files (.plo file) for each CEA modelled using FullCAM;
(f) information regarding fires occurring in a CEA, including:
    (i) the date the fire occurred;
    (ii) the location of the fire;
    (iii) the proportion of the CEA affected by the fire; and
    (iv) the percentage of trees that were killed by the fire;
(g) information regarding each Equation in Division 3 of Part 4, including:
    (i) all input data;
    (ii) the result;
(h) records relating to fuel use on project activities.

Note: Records referred to in paragraph (h) could include invoices, vehicle logbooks, records of project activities, or reports of calculated consumption based on hourly or per hectare consumption rates.

If these fuel use records for project activities cannot be disaggregated from records for other non-project activities, estimates of project fuel use may be based on the time spent undertaking project activities and the known average fuel consumption of vehicles or machinery.

Division 4—Offsets report requirements

73 Information in first offsets report

A project proponent must include the following information in the first offsets report for each project area:

(a) net abatement amount for the first reporting period for the reforestation project;
(b) carbon stock change for the first reporting period for the reforestation project;
(c) total emissions due to biomass burning for the reforestation project;
(d) total emissions due to project activities;
(e) initial carbon stock for the first reporting period;
(f) if the planting date occurred before the declaration date—the initial carbon stock at the declaration date;
(g) carbon stock for the reforestation project at the end of the reporting period;

(h) a copy of the latest reforestation management plan;
(i) if, in the circumstances described in paragraph 6(2)(b), a factor or parameter is defined or calculated for a reporting period by reference to an instrument or writing as in force from time to time:
    (i) the versions of the instrument or writing used for the factor or parameter;
    (ii) the start and end dates of each use; and
    (iii) the reasons why it was not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period;
(j) date-stamped FullCAM plot files (.plo) and a copy of the associated output data in a spread sheet file for each CEA in the project area;
(k) if a calibration with a stocking density of more than 1,500 stems per hectare is applied for FullCAM modelling:
    (i) the planting spacing;
    (ii) if applicable, evidence of stocking density; and
    (iii) evidence that the adjacent tree assessment process specified in Division 9 of Part 3 has been completed and the result for each CEA;

Note: Section 32 specifies the circumstances where evidence of stocking density is required.

(l) the calibrations used when estimating carbon abatement using FullCAM;
(m) information (obtained using on-ground observation, remotely-sensed imagery or any other technologies specified in the CFI Mapping Guidelines) to demonstrate that the requirements for the use of a calibration have been met;
(n) geospatial maps that identify:
    (i) each CEA;
    (ii) any exclusion areas; and
    (iii) the model point for each CEA;
(o) if the areas specified in paragraph (n) are not clearly visible on the maps, a list of names or other identifiers that identify the project area and CEA;
(p) details of any fuel use (including an estimate of the quantity of fuel, recorded in kilolitres (kL), for each fuel type combusted when undertaking project activities within a reporting period);
(q) the modelling commencement date of each CEA;
(r) information and evidence to demonstrate the implementation of project activities and forest potential in each CEA;
(s) if forest cover is attained in the reporting period, an estimate of the year when forest cover was achieved, evidence that forest cover was achieved, and evidence that forest cover is maintained;
(t) a description of any management actions or disturbance events that affected each CEA during the reporting period, including:
    (i) the type and timing of any thinning activities;
    (ii) the type and timing any fertiliser applications;
    (iii) the type, timing and extent of any disturbance events;

(iv) if applicable, actions proposed and undertaken to ensure that carbon stocks are restored;

(u) details of any fuel use (including an estimate of the quantity of fuel, recorded in kilolitres (kL), for each fuel type combusted when undertaking project activities within a reporting period);

(v) a description of any removal of woody biomass for personal use (whether planned, expected or actual);

(w) of applicable, information relating to compliance with section 50, including evidence to demonstrate the percentage of items harvested in any one year;

(x) a description of the timing and intensity of any grazing and, if applicable, evidence demonstrating that grazing has not prevented the requirements in section 51 being met.

Note: If the project proponent has previously submitted an offsets report for the project under another CFI methodology determination, then the first offsets report for the project is taken to have been submitted under that CFI methodology determination.

74 Information in subsequent offsets report

The following information must be included in the second and subsequent offsets reports for each project area:

(a) net abatement amount for the reforestation project for the reporting period;

(b) carbon stock change for the reporting period;

(c) total emissions due to biomass burning for the reforestation project;

(d) total emissions due to project activities;

(e) carbon stock for the reforestation project at the end of the reporting period;

(f) if there have been any changes to the reforestation management plan, a copy of the updated reforestation management plan;

(g) if, in the circumstances described in paragraph 6(2)(b), a factor or parameter is defined or calculated for a reporting period by reference to an instrument or writing as in force from time to time:

(i) the versions of the instrument or writing used for the factor or parameter;

(ii) the start and end dates of each use;

(iii) the reasons why it was not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period;

(h) date-stamped FullCAM plot files (.plo) and a copy of the associated output data in a spread sheet file for each CEA in the project area;

(i) if CEA boundaries have not changed since the previous reporting period, a statement that the CEA boundaries have not been changed;

(j) if CEA boundaries have changed since the previous reporting period:

(i) details of the changes to the CEAs, and, if applicable, exclusion areas;

(ii) updated geospatial maps that identify each CEA, any exclusion areas, and the model point for each CEA;

(k) if the areas specified in paragraph (j) are not clearly visible on the maps, a list of names or other identifiers that identify the project area and CEA;

(l) information and evidence to demonstrate the ongoing implementation of project activities and forest potential in each CEA;
(m) if forest cover is attained in the reporting period, an estimate of the year when forest cover was achieved, evidence that forest cover was achieved, and evidence that forest cover is maintained;
(n) if forest cover was attained in a previous reporting period, evidence that forest cover has been maintained;
(o) a description of any management actions or disturbance events that affected each CEA during the reporting period, including:
  (i) the type and timing of any thinning activities;
  (ii) the type and timing any fertiliser applications;
  (iii) the type, timing and extent of any disturbance events;
  (iv) if applicable, actions proposed and undertaken to ensure that carbon stocks are restored;
(p) details of any fuel use (including an estimate of the quantity of fuel, recorded in kilolitres (kL), for each fuel type combusted when undertaking project activities within a reporting period);
(q) a description of any removal of woody biomass for personal use (whether planned, expected or actual);
(r) of applicable, information relating to compliance with section 50, including evidence to demonstrate the percentage of items harvested in any one year;
(s) a description of the timing and intensity of any grazing and, if applicable, evidence demonstrating that grazing has not prevented the requirements in section 51 being met.

Note: Evidence of the information specified in paragraph (i) may include date-stamped, geo-referenced, remotely-sensed imagery.

Division 5—Reporting under section 77A of the Act

75 No division of project area

For the purposes of subsection 77A(2) of the Act, the division of the overall reforestation project must not result in the division of a project area.

Schedule 1—Gases accounted for in calculations

Carbon pool	**Greenhouse gas**
Live above-ground biomass	Carbon dioxide (CO_2)
Live below-ground biomass	Carbon dioxide (CO_2)
Debris	Carbon dioxide (CO_2)
Emission source	**Greenhouse gas**
Fuel use	Methane (CH_4)
	Nitrous oxide (N_2O)

	Carbon dioxide (CO_2)
Fire—planned and unplanned	Methane (CH_4) Nitrous oxide (N_2O)