# EXPLANATORY STATEMENT

Issued by the Authority of the Parliamentary Secretary for Climate Change and Energy Efficiency

*Carbon Credits (Carbon Farming Initiative) Act 2011*

*Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even-Aged Native Forest) Methodology Determination 2013*

## Background

The *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act) enables the crediting of greenhouse gas abatement in the land sector. Greenhouse gas abatement is achieved either by reducing or avoiding emissions or by removing carbon from the atmosphere and storing it in soil or trees.

Abatement activities are undertaken as offsets projects. The process involved in establishing an offsets project is set out in Part 3 of the Act. An offsets project must be covered by, and undertaken in accordance with, a methodology determination.

Subsection 106(1) of the Act empowers the Minister to make, by legislative instrument, a methodology determination. The purpose of a methodology determination is to establish procedures for estimating abatement (emissions reductions and sequestration) and project rules for monitoring, record keeping and reporting on abatement.

A methodology determination must meet the offsets integrity standards set out in section 133 of the Act and the other eligibility criteria set out in section 106 of the Act. The Minister cannot make a methodology determination unless the Domestic Offsets Integrity Committee (DOIC) has endorsed the proposal for the methodology determination under section 112 of the Act and advised the Minister of the endorsement under section 113 of the Act. The DOIC is an independent expert panel established to evaluate proposals for methodology determinations.

## Application of the Determination

The *Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even-Aged Native Forest) Methodology Determination 2013* (the Determination) sets out the detailed rules for implementing and monitoring offsets projects that sequester carbon by establishing permanent native forests through assisted regeneration from in situ seed sources, including rootstock and lignotubers. The regeneration involves the management or removal of external pressures that prevent regrowth from occurring. The Determination applies to projects in which land has been cleared of native vegetation and where regrowth has been suppressed for at least 10 years.

Ancillary benefits from the regeneration may include the enhancement of biodiversity, alleviation of dryland salinity, reduced wind and/or water erosion and, in some circumstances, shade and shelter for livestock.

A project proponent wanting to implement the Determination must make an application to the Clean Energy Regulator (the Regulator) and meet the eligibility requirements for an offsets

project set out in subsection 27(4) of the Act. These requirements include compliance with the rules set out in the Determination. Abatement must be modelled using the CFI Reforestation Modelling Tool (RMT) which has been developed by the Department of Climate Change and Energy Efficiency (the Department), available at: ncat.climatechange.gov.au/cfirefor/.

Offsets projects that are undertaken in accordance with the Determination and approved by the Regulator can generate Australian carbon credit units (ACCUs) that can be sold to:

- Australian companies that pay the carbon price established under the *Clean Energy Act 2011*; and
- businesses in Australia wanting to offset their own carbon pollution.

**Public Consultation**

The methodology determination proposal for *Human-Induced Regeneration of a permanent even-aged native forest* (the proposal) was developed by the Department in consultation with representatives from industry and local and state government.

The proposal was published on the website of the Department from 17 August to 26 September 2012 for public comment. Six public submissions relating to the proposal were received.

The DOIC considered the issues raised in the public submissions during its assessment of the proposal as required under subsection 112(5) of the Act.

The proposal was endorsed by the DOIC on 21 January 2013.

The Department consulted with representatives from industry and with the Regulator in the development of the Determination.

**Determination Details**

The Determination is a legislative instrument within the meaning of the *Legislative Instruments Act 200*3.

The Determination commences retrospectively from 1 July 2010.

Retrospective commencement is authorised by subsection 122(3) of the Act, which provides that a determination can be expressed to have come into force on 1 July 2010 if the determination is made on or before 30 June 2013, and the application for endorsement was made on or before 30 June 2012. Both of these conditions are satisfied in this case.

Details of the Determination are at Attachment A.

**Statement of compatibility prepared in accordance *with Part 3 of the Human Rights (Parliamentary Scrutiny) Act 2011***

This legislative instrument does not engage any of the applicable rights or freedoms.

*Conclusion*

This legislative instrument is compatible with human rights as it does not raise any human rights issues.

Attachment A

## Details of the Methodology Determination

### Part 1 Preliminary

1.1 Name of Determination

Section 1.1 sets out the full name of the Determination, which is the *Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even-Aged Native Forest) Methodology Determination 2013*.

1.2. Commencement

Section 1.2 provides that the Determination commences retrospectively from 1 July 2010. Retrospective commencement is authorised by subsection 122(3) of the Act.

While the Determination may apply to projects that were established prior to 1 July 2010, a project proponent can earn credits only for abatement which occurs from 1 July 2010. Subsections 27(15) and (16) of the Act prevent the crediting of abatement before this date.

1.3 Definitions

Section 1.3 defines a number of terms used in the Determination.

Key definitions include:

- 'carbon estimation area', which means a stratum of the project area that complies with section 3.3.
- 'forest cover', which refers to vegetation on land where:
  (a) the land has an area of at least 0.2 of a hectare; and
  (b) the vegetation includes trees that are at least 2 metres in height and provide crown cover of at least 20% of the land.

- ‘native vegetation’, which means vegetation that consists of species native to the local area, and with a mix of trees, shrubs, and understorey species that reflects the structure and composition of the local native vegetation community. A monoculture may constitute native vegetation where it can naturally occur within the local vegetation community.
- ‘human-assisted regeneration activity’, which means the human-induced regeneration of a native forest by one or more of the following land management activities:
    (a) keeping livestock out of the area;
    (b) managing the timing and the extent of grazing;
    (c) managing feral animals in a humane manner;
    (d) managing plants that are not native to the project area;
    (e) ceasing to destroy or suppress regrowth.
- ‘project commencement’, which refers to the date for which there is documentary evidence that suppression activities in the project area have ceased or will cease and a human-assisted regeneration activity will commence. For the purposes of the Determination the project commencement date must be on or after 1 July 2007.
- ‘suppression activity’, which means a combination of land use and land management practices that prevents the regeneration of native vegetation on land. The regeneration can be prevented under the Determination only due to the effect of one or more of livestock, feral animals, plants that are not native to the area, and the mechanical or chemical destruction, or suppression, of regrowth.

Generally, terms that are not defined in the Determination have the meaning given by section 5 of the Act. The Act is available at www.comlaw.gov.au.

***Note*** In accordance with section 23 of the *Acts Interpretation Act 1901*, words in the Determination in the singular number include the plural and words in the plural number include the singular.

## 1.4 Type of project to which this Determination applies

The effect of paragraphs 27(4)(b) and 106(1)(a) of the Act is that a project must be covered by a methodology determination, and the determination must specify the kind of offsets project to which the determination applies.

The Determination applies to an offsets project to establish and maintain a permanent native forest on land through assisted regeneration. It involves encouraging seed stores in the soil or from remnant native plants, and/or rootstock already present at and native to the site, to sprout and germinate.

The assisted regeneration of forest includes one or more of the following land management activities:

(a) the exclusion of livestock;
(b) the management of the timing and the extent of grazing;
(c) the management, in a humane manner, of feral animals;
(d) the management of plants that are not native to the project area;

(e) the cessation of suppression activities.

The Determination applies where the land management activity occurs on areas of cleared land where regrowth has been regularly suppressed but has the potential to grow if suppression activities are ceased, or on cleared areas that abut existing remnant vegetation. The Determination does not apply to projects that establish a permanent native forest cover by the manual planting of seed or seedlings.

Section 1.4 sets out the details of the type of project to which the Determination applies.

## Part 2 Requirements for declaration as eligible project

### 2.1 Eligible projects

The effect of paragraph 106(1)(b) of the Act is that a methodology determination must set out requirements that must be met for the offsets project to be an eligible offsets project. Under paragraph 27(4)(c) of the Act, the Regulator must not declare that an offsets project is an eligible offsets project unless the Regulator is satisfied that the project meets these requirements.

Part 2 of the Determination specifies a number of requirements that must be met in order for a project to be declared an eligible offsets project. These requirements are in addition to those set by the Regulations for applications for a declaration.

### 2.2 Location

Section 2.2 provides that the project area must be within Australia, excluding the external territories.

The Determination does not apply to a project occurring in the external territories as the RMT cannot currently model sequestration in these areas.

### 2.3 Land management characteristics

Section 2.3 sets out the requirements for land in the project area where project activities may occur and, as a consequence, project abatement estimated. Areas where project activities will not occur are known as exclusion areas. These areas must be excluded because they will have a material effect on the abatement calculation.

Under the Determination, the project area must include land that has been subject to suppression activity as set out in subsection 2.3(1).

The activity must occur on areas of cleared land on which regrowth has been regularly suppressed but has the potential to grow if suppression activities ceased, or on cleared areas that abut existing vegetation.

The Determination uses the term 'forest cover' to distinguish trees that have *actually* reached a state of forest cover, from the Kyoto definition of 'forest' which includes trees that have the *potential* to achieve forest cover.

The regeneration must be the result of human-assisted regeneration activities. If forest cover has been achieved before project commencement then it is taken to have occurred without human assistance and is not covered by this Determination.

Subsection 2.3(2) sets out the evidence that must be provided to the Regulator upon request to demonstrate the ceasing of a suppression activity and commencement of human-assisted regeneration in the project area.

### 2.4 Test for baseline carbon stocks taken to be zero

Land used in the project must include land that has been subject to suppression activity. Paragraph 2.3(1)(b) specifies that an effect of the suppression activity is that the baseline carbon stock is taken to be zero for the baseline period.

The evidence requirements and test for ensuring that the baseline carbon stock is zero are set out in section 2.4.

## 2.5 Project mechanisms

Section 2.5 clarifies that the project must consist of the establishment or maintenance of native vegetation only through the promotion and management of regeneration from natural seed sources. The Determination does not apply to projects that involve direct seeding or planting. The activity is the management or human-assisted removal of pressures that prevent regeneration from occurring.

## 2.6 Identification of project area

The project area includes land on which an offsets project is carried out.

A project proponent is required to define the geographic boundaries of the project area when seeking a declaration of an eligible offsets project. The information and documentary requirements to identify a project area are specified in regulation 3.1 of the Regulations. This provision sets out the information and documentation that must accompany an application for a project to be declared an eligible offsets project.

Section 2.6 provides that the boundaries of the project area must be delineated in accordance with Part 3 of the Determination.

In many cases it is expected that a project area will consist of the whole of a land title area. Some areas within the project area will not be part of the project operation, such as a homestead, areas of existing forest, and areas that are not capable of regenerating a forest. These exclusion areas can be part of the project area and must not be included in a carbon estimation area.

## Part 3 Requirements for operation of eligible projects

### Division 3.1 Operation of eligible projects

3.1 Operation of eligible projects

Section 3.1 specifies that the rules for operating a project under the Determination are set out in Part 3.

### Division 3.2 Initial stratification

3.2 Project area must be stratified

Section 3.2 of the Determination specifies that a project area must be stratified into carbon estimation areas and exclusion areas according to the site characteristics and management practices that affect the growth rate of trees in the area. This must be done before the first offsets report is submitted.

A project area must contain at least one carbon estimation area, and may include one or more exclusion areas.

The project area, or part of the project area, may only be re-stratified as provided for in Division 3.2.

3.3 Requirements for a carbon estimation area

Section 3.3 sets out the requirements for stratifying a carbon estimation area in order to model abatement in the area using the RMT. Stratification must be done in accordance with the requirements set out in the CFI Mapping Guidelines.

Stratification must be done according to the management of the site and the commencement of human-assisted regeneration activities. This is because differences in the timing and nature of land management can affect the uniformity of regeneration and must be modelled individually.

All the regeneration that occurs within a carbon estimation area must be the result of the same change in management practice, and occur during the same period of time (for example, growing seasons). For the purpose of the Determination, regeneration is assumed to occur simultaneously, with the age of the regeneration taken to be zero until such time as there is enough regeneration of appropriate plant species or species mix to make the reasonable assumption that at maturity the stand will meet the definition of forest cover.

Stratification is not required if the entire project area is homogenous both in site characteristics and management activities.

A carbon estimation area must contain regeneration of the same forest type or vegetation community.

A project proponent may use a range of approaches to determine the boundaries of a carbon estimation area, but must include at least one of the following:

- field surveys and sampling;
- aerial photographs;

- remotely-sensed imagery; or
- soil, vegetation and landform maps.

The use of Global Positioning System mapping is recommended, but is not required, when identifying carbon estimation area boundary locations.

Each carbon estimation area must contain a static 'model point' location (latitude and longitude) for the purpose of estimation with the RMT. Points may not change over time unless the carbon estimation area is re-stratified into two or more areas.

### 3.4 Re-stratification or re-classification of a carbon estimation area

A carbon estimation area must be re-stratified if the occurrence of regrowth is determined to be patchy, inconsistent, irregular or absent. This can be determined by visual confirmation – for example, with aerial maps or spatial images.

A carbon estimation area must also be re-stratified to isolate areas that are subject to changed land management practices.

A project proponent is not required to stratify for natural disturbance as this can be modelled by the RMT as a proportion of the carbon estimation area affected. The exception to this is a severe fire event that kills trees. In these circumstances, and where there is potential for regeneration from in situ seed sources, re-stratification after disturbance is required.

A project proponent is also required to re-stratify if it is found that site characteristics are not uniform. This may occur if, for example, there is a large salinity-affected part of the project area which was not obvious when the project was earlier stratified.

### 3.5 Requirements for an exclusion area

An area of land must be defined as an exclusion area, in accordance with the CFI Mapping Guidelines, if it is an area of land within the project area which will not be subject to the project activities. An exclusion area may adjoin, or be contained within the boundaries of, a carbon estimation area. If an area is defined as an exclusion area, it is excluded as a source of abatement for the project.

An area must be an exclusion area if:

- the area does not have forest potential; or
- the project activity cannot occur in the area, for example the area is a road, water course or large rock outcrop which materially affects the abatement calculation; or
- the area fails to regenerate after undertaking project mechanisms.

An exclusion area must not contain a model point location.

### 3.6 Carbon estimation area boundaries

The boundaries of each stratum must be identified on a geospatial map of the project area, in accordance with the CFI Mapping Guidelines.

For projects established on or after the date a project is declared an eligible offsets project, the boundaries of a stratum can, but do not have to, be identified at project commencement. However, they must be identified when the first offsets report is submitted to the Regulator. If the project was established prior to the declaration date, the boundaries must be identified as part of the project application.

If a carbon estimation area is re-stratified, the new boundaries must be identified in the next offsets report submitted to the Regulator after the re-stratification.

**Division 3.3 Project operation**

Division 3.3 prevents certain activities from occurring in the project area which may have an impact on carbon stocks.

3.7 Commercial harvesting exclusion

Section 3.7 specifies that no more than 10% of fallen timber may be removed for firewood for personal use each calendar year. No other removal of carbon stock is permitted.

The effect of section 3.7 is that commercial harvesting is not permitted under the Determination.

3.8 Grazing exclusion

Section 3.8 does not allow livestock grazing in the project area until the regenerated growth meets the definition of 'forest cover' in the Determination. Even after this time, livestock grazing cannot occur if it would prevent or inhibit the growth or maintenance of the forest cover. If it is allowed, the project proponent must be able to demonstrate that the grazing has not affected the forest cover.

3.9 Thinning exclusion

Under section 3.9, the thinning of trees and shrubs cannot be undertaken after project commencement.

3.10 Use of lime or fertiliser

Section 3.10 provides that lime or fertiliser must not be used on project area land that is subject to regeneration.

## Part 4 The net abatement amount

### Division 4.1 The net abatement amount

4.1 The net abatement amount

Under the Determination, abatement is calculated as the change in the amount of carbon stored in a project area (through the combined effect of tree growth, natural decay and disturbance events such as fire, pest, disease and storm), minus emissions resulting from fire and from fuel used to establish and maintain the project.

### Division 4.2 Calculations - Preliminary

4.2 How calculations are to be made

Paragraph 4.2(a) clarifies that all calculations are in respect of activities done, or outcomes achieved, during a reporting period for a project.

Paragraph 4.2(b) clarifies that, if a factor or parameter is derived from the Determination made under subsection 10(3) of the *National Greenhouse and Energy Reporting Act 2007* (the NGER Measurement Determination) or the *National Greenhouse and Energy Reporting Regulations 2008* (the NGER Regulations), and if those instruments are amended during a reporting period, then a project proponent is required to use the factor or parameter prescribed in the NGER Measurement Determination or NGER Regulations that is in force at the time the report is submitted, or is required to be submitted, whichever is earlier. The table below sets out the factors or parameters to be used in the calculation of abatement other than those used to calculate emissions from fuel and electricity.

*Factors or Parameters found in the NGER Regulations to be used in the calculation of abatement*

| **Factor or Parameter** | **Reference** | **Value of Factor or Parameter at 1 January 2013** |
|---|---|---|
| $\mathbf{GWP_{CO_2}}$ | The global warming potential of carbon dioxide as specified in regulation 2.02 of the NGER Regulations | 1 |
| $\mathbf{GWP_{CH_4}}$ | The global warming potential of methane as specified in regulation 2.02 of the NGER Regulations | 21 |
| $\mathbf{GWP_{N_2O}}$ | The global warming potential of nitrous oxide as specified in regulation 2.02 of the NGER Regulations | 310 |

## 4.3 Greenhouse gas assessment boundary

Section 4.3 describes the greenhouse gas sources and sinks and relevant carbon pools that need to be assessed in order to determine the amount of carbon dioxide removed from the atmosphere when undertaking the project activity. The greenhouse gas assessment boundary includes the tree and debris carbon pools within the project area and the emission of greenhouse gases from establishing and managing the project.

The carbon pools and emission sources which need to be taken into account when calculating abatement for the project are set out in the following table.

*Emissions and removals in the project boundary*

| |
|---|
| **Emissions from and removals to the above and below ground tree and debris pools** |
| Increases in carbon stocks relating to tree growth |
| Reductions in carbon stocks relating to biomass decay |
| Reductions in carbon stocks relating to disturbance – fire or management events |
| **Emissions from fire** |
| Methane emissions from fire – prescribed and uncontrolled |
| Nitrous oxide emissions from fire – prescribed and uncontrolled |
| **Emissions from project activities** |
| Emissions from use of fuel to power vehicles and machinery for planning and site selection |
| Emissions from use of fuel to power vehicles and machinery for management operations, including thinning of trees and fire control (prescribed and uncontrolled) |
| Emissions from use of fuel to power vehicles and machinery for transportation and travel (of people or supplies) between business locations, or for deliveries to the project site. |

A number of emission sources are excluded from the abatement calculations for the following reasons:

- emissions from soils are excluded as these are not a net source of emissions over the life of the project;

- emissions from the removal of pre-existing non-woody vegetation are excluded as the Determination only applies to projects on land that was clear of forest. It is assumed that non-woody biomass which is cleared for site preparation will be approximately equal to or less than the forest understorey (which is not included in abatement calculations) and therefore the effect is negligible. Emissions from the required removal of known weed species from the project area are not included in the project greenhouse gas assessment boundary as it is assumed that this would occur under the baseline conditions. Other woody vegetation can be excluded spatially (that is, in an exclusion area);

- emissions from domestic fires resulting from the burning of fallen timber are excluded as they are immaterial;

- emissions from fertiliser use or lime application are excluded on the grounds that the application of fertiliser is prohibited under the Determination;

- emissions from grazing of livestock in the project area are excluded as grazing is not permitted immediately after the change in management to allow the germination of regrowth to establish and any grazing after this time must not prevent or temporarily inhibit tree regeneration or growth in the project area. It is therefore unlikely that the project would result in production of enough feed to allow for an increase in livestock numbers that would lead to increased emissions.

4.4 Baseline for the project

Section 4.4 specifies the process for identifying a project baseline as required under paragraph 106(4)(f) of the Act.

The baseline for a project to which the Determination applies is taken to be zero. This Determination only applies to land where grazing, pasture management or cropping has suppressed regrowth such that any regeneration that occurred over the 10 year period prior to project commencement meets the test for baseline carbon stocks to be taken to be zero in subsection 2.4.

4.5 Forest potential required for calculations

Section 4.5 provides that the carbon stock of a carbon estimation area that does not yet have forest potential is taken to be zero.

4.6 Changes in carbon estimation areas

Section 4.6 clarifies that all calculations must be done on the basis of the carbon estimation areas of the project as they were at the end of the reporting period.

## 4.7 Use of Reforestation Modelling Tool

The RMT is a computer program that estimates greenhouse gas emissions and removals within the tree and debris carbon pools based on data inputs of plant species, management regimes and disturbance events.

Section 4.7 provides that a project proponent must use the 'mixed species environmental planting' as the species setting, and 'non-harvested regime, planting density: direct seeding' as the regime setting in the RMT to estimate sequestration in above and below ground carbon pools, emissions from disturbance and the effects of management actions to be used in the calculation of abatement. It also specifies the parameters that must be supplied from the RMT for use in calculating abatement.

Subsection 4.7(1) specifies that a project proponent must use the RMT to determine the following:

| Parameter | Description |
|---|---|
| $IC_{CEA,i}$ | the initial carbon stock for each carbon estimation area within the project area |
| $C_{CEA,i}(r_c)$ | the carbon stock for a carbon estimation area within the project area at the end of the reporting period |
| $M_{tb,i}$ | the tree layer carbon emitted to the atmosphere for each month of a reporting period |
| $M_{db,i}$ | the debris layer carbon emitted to the atmosphere for each month of a reporting period |
| $E_F(r_c)$ | the emissions from fire within a carbon estimation area within a project area |

The area and model point location (latitude and longitude) data for each carbon estimation area must be collected using the CFI Mapping Tool or other geospatial information system, in accordance with the CFI Mapping Guidelines, and reported to the RMT. Information about forest management and disturbance events must also be supplied to the RMT.

For a disturbance event, the following information must be supplied to the RMT:

- the CEA affected by the event;
- the timing of the event; and
- the area affected (proportion of carbon estimation areas), and whether trees are killed or have survived in each area.

The RMT generates output data for emissions and removals from the tree and debris pools which must be used to calculate abatement.

*RMT output data required for calculating abatement*

| RMT Output | Unit | Description | Form | Parameter |
|---|---|---|---|---|
| C mass on-site | tonnes C | Carbon stock – tree and debris pools | Time series (cumulative monthly) | $C_{CEA}$ |
| C mass emitted from debris due to fire | tonnes C | Carbon emitted to the atmosphere - debris layer | Time series (monthly) | $M_{tb}$ |
| C mass emitted from trees due to fire | tonnes C | Carbon emitted to the atmosphere - tree layer | Time series (monthly) | $M_{db}$ |

The equations in the Determination take account of the form of RMT outputs, including that:

- carbon stock is the cumulative total, while emissions due to fire are presented as per-month estimates; and
- RMT outputs are presented in tonnes of carbon and must be converted to tonnes of carbon dioxide equivalence (CO2-e).

## Division 4.3 Calculation of carbon stock change

Division 4.3 outlines the equations required to calculate the carbon stock change for the project area.

### 4.8 Step 1 - Calculate the initial carbon stock of the project area

The initial carbon stock within the project area must be calculated using Equation 1a.

For a project established on or after the project's declaration date, the initial carbon stock is taken to be zero.

For a project that commences before the declaration date, the initial carbon stock for a project area is taken to be the carbon stock actually present in each carbon estimation area at the declaration date. This must be determined using the RMT in order to exclude biomass growth prior to the declaration date. This ensures that carbon stocks occurring prior to the declaration date are excluded from the abatement calculations and are not credited.

Unless the initial carbon stock is zero, the initial carbon stock for a project area must be recalculated each time a report is submitted to the Regulator to ensure the correct values for initial carbon stock are provided to the RMT.

4.9 Step 2 - Calculate the carbon stock of the project area at the end of a reporting period

The carbon stock within a project area at the end of a reporting period must be calculated using Equation 1b. The carbon stock of each carbon estimation area within the project area must be determined using the RMT and the amounts must be aggregated, in accordance with Equation 1b.

4.10 Step 3 - Calculate the carbon stock change for the project area

The carbon stock change for the project area for the first reporting period must be calculated using Equation 2a and for the second and subsequent reporting periods using Equation 2b.

In the first reporting period, the carbon stock change is the carbon stock at the end of the reporting period determined using the RMT minus the initial carbon stock.

In the second and subsequent reporting periods, the carbon stock change is calculated in the following way:

1. Determine the carbon stock for the reporting period at the month ending the reporting period using the RMT;

2. Subtract from this amount the carbon stock reported for the end of the previous reporting period at the month ending that reporting period;

3. Recalculate the initial carbon stock at the time of submitting the report using the RMT; and

4. Subtract from this amount the initial carbon stock reported for the previous reporting period.

If the initial carbon stock for the project is zero, it is not necessary to perform steps 3 and 4 as the initial carbon stock in that case will always be zero.

Equations 2a and 2b have been designed to enable changes to the underlying datasets of the RMT to be incorporated into the carbon stock change calculation. This ensures proponents are credited according to estimates generated using the most recent data included in the RMT.

4.11 Step 4 - Convert the carbon stock change to $CO_2$-equivalent

Section 4.11 requires the carbon dioxide equivalent ($CO_2$-e) of the carbon stock change to be calculated using Equation 3 for use in subsequent equations. The Global Warming Potential of carbon dioxide is 1.

## Division 4.4 Calculation of project emissions

4.12 Step 1 - Calculate methane and nitrous oxide emissions

Section 4.12 sets out the calculations that must be done to calculate the emissions of methane and nitrous oxide due to biomass burning. A project proponent is required to model emissions from fire for all months within the reporting period using the RMT. The RMT must be used to calculate the tree layer carbon and the debris layer carbon emitted to the atmosphere in tonnes for each month of a reporting period.

Equation 4 must be used to calculate emissions from methane ($CH_4$) due to fire for the project.

Equation 6 must be used to calculate emissions from nitrous oxide ($N_2O$) due to fire for the project.

Equation 7 must be used to calculate the total non-$CO_2$ emissions from fire.

Note that there is no Equation 5 in the Determination.

4.13 Step 2 – Calculate emissions from fuel use

The total emissions from the use of fuel in undertaking project activities in the project area must be estimated using the energy content and emission factors outlined in Schedule 1 of the NGER Measurement Determination. The relevant energy content and emission factors are included, with worked examples, in the National Greenhouse Accounts Factors National Greenhouse Accounts Factors available at www.climatechange.gov.au/climate-change/emissions.aspx.

If the NGER Measurement Determination is amended during the offsets reporting period, the estimation of emissions must use the factor or parameter which is specified in the Measurement Determination that is in force at the time a report is submitted or required to be submitted, whichever is the earlier.

The quantity of fuel use for each fuel type (f) for the reporting period must be calculated using Equation 8.

Emissions from fuel use must be calculated using Equation 9 for each fuel type (f) and each greenhouse gas (carbon dioxide, nitrous oxide and methane). The total emissions from fuel for the reporting period must be calculated using Equation 10.

4.14 Step 3 - Calculate project emissions

The project emissions ($CO_2$-e) for the project for the reporting period is the sum of the total emissions due to biomass burning (calculated using Equation 7) and the total emissions from fuel use (calculated using Equation 10).

## Division 4.5 Calculating the carbon dioxide equivalent net abatement amount

4.15 Calculating the carbon dioxide equivalent net abatement amount

Paragraph 106(1)(c) of the Act provides that a methodology determination must specify a method for calculating the carbon dioxide equivalent net abatement amount for the project in relation to a reporting period.

The carbon dioxide equivalent net abatement amount for the Determination must be calculated for a reporting period using Equation 11. Net abatement for the reporting period is the carbon stock change less emissions from biomass burning and fuel use.

A project proponent is entitled to ACCUs equal to the amount of abatement measured according to the Determination for the reporting period, minus the risk of reversal buffer – assuming all other eligibility criteria continue to be met. The risk of reversal buffer is 5% unless another percentage is specified in the Regulations (see subsection 16(2) of the Act).

## Part 5 Monitoring, record-keeping and reporting requirements

### Division 5.1 General

5.1 Application

The effect of paragraph 106(3)(d) of the Act is that a methodology determination may require the project proponent of an eligible offsets project to comply with specified requirements to monitor a project.

A project proponent who fails to monitor a project in accordance with any monitoring requirements in the applicable methodology determination will have contravened a civil penalty provision (section 194 of the Act).

The monitoring, record-keeping and reporting requirements specified in Part 5 of the Determination are in addition to any requirements specified in the Regulations.

5.2 Geospatial information requirements

Section 5.2 establishes that a project proponent must use either the CFI Mapping Tool or an alternative geographic information system to monitor and report on geospatial information concerning the offsets project. The boundaries of the project area, carbon estimation areas and exclusion areas within a project area must be defined in accordance with the CFI Mapping Guidelines.

### Division 5.2 Monitoring requirements

5.3 Project monitoring

A project proponent must monitor a project area and adjust the boundaries of areas within the project area if they no longer meet the requirements of the Determination or require further stratification.

A project proponent must monitor disturbances in a project area and supply this information to the RMT. The CEA affected by the event, the timing of the event, the area affected (proportion of carbon estimation areas), and whether trees are killed or survived in each area must be reported.

On-ground observation or remotely-sensed imagery or both may be used to monitor projects.

### Division 5.3 Record-keeping requirements

5.4 Records that must be kept

Section 5.4 specifies the records that must be created and maintained by a project proponent in relation to the project.

5.5 Forest management information

Section 5.5 specifies the records that constitute forest management information.

5.6 Project area information

Section 5.6 specifies the records that constitute project area information.

## Division 5.4 Offsets report requirements

A project proponent will be required to submit:

- a report for the first reporting period; and
- ongoing reports for subsequent reporting periods.

5.7 Information that must be included in first offsets report

Section 5.7 sets out the information that must be included in an offsets report for the first reporting period.

5.8 Subsequent reporting periods

Section 5.8 sets out information that must be included in the second and subsequent offsets reports.