Department of
Primary Industries and
Regional Development

GOVERNMENT OF
WESTERN AUSTRALIA

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Land Management Strategy - Soil Carbon

Carbon for Farmers Voucher Program 2022

Carbon Farming and Land Restoration Program

Overview

The Western Australian Government has developed the *Carbon for Farmers Voucher Program* to support farmers in the South West Land Division to develop a Land Management Strategy (LMS) for carbon farming projects.

A well-prepared LMS will support the landholder understand both how to maintain and integrate carbon sequestration on their land and their broader business objectives. The LMS should consider interaction between changing management practices, soil types, climate and other environmental factors, and broader farm system outcomes.

Professional Service Providers should work collaboratively with the landowner to ensure the obligations, risks, and potential rewards of undertaking a carbon farming project are understood. As the LMS will inform important, long term investment decisions it needs to be tailored to individual business needs and circumstances.

Purpose

The *Land Management Strategy - Soil Carbon* provides a template to create a sufficiently detailed LMS to set out information about the project's proposed activities to support registration with the Clean Energy Regulator (CER) and increase the success of proposals submitted to the WA Carbon Farming and Land Restoration Program. These submissions are evaluated by the Department of Primary Industries and Regional Development (DPIRD) to determine the project's potential as an ACCU Plus investment.

The process of developing the LMS helps landholders to understand the key details of integrating and maintaining carbon sequestration into their enterprise.

The LMS should include key issues that a landholder needs to consider over the life of the project, and reflect the nominated permanence period (i.e. 25 or 100 years). Landholders need to ensure that they can make informed decisions based on the LMS and other information to deliver their permanence obligations, and to ensure that the project fits their long-term land management and business plans.

Resources

DPIRD recommends that the author of the LMS refers to the following resources for compliance and eligibility considerations:

Clean Energy Regulator / Climate Solutions Fund

Soil Carbon Projects - Climate Solutions Fund webpage

Guidance for meeting the requirements of soil carbon land management strategies for 2021 soil carbon projects

Understanding your soil carbon project – Simple method guide

Western Australian Carbon Farming and Land Restoration Program

These webpages contain a range of information materials.

https://www.agric.wa.gov.au/CF-LRP

https://www.agric.wa.gov.au/CF-LRP/Resources

Choosing the Right Professional Service Providers for your Carbon Farming Project

In alignment with the CER, DPIRD advises landholders new to the carbon market and Emissions Reduction Fund to seek professional advice regarding the technical and regulatory aspects of a carbon farming project, as well as financial, legal and tax advice.

Instructions for using this template

This document provides a template with headings to support you to develop the LMS.

The contents of the template are considered the minimum requirements. Additional information that supports landholders' decision on carbon farming unique to the project can also be included.

The landowner may wish to include other project related information to assist their decision making. (See the *Carbon for Farmers Voucher Program* Guidelines pg. 6).

Note:

When claiming reimbursement for the voucher, a separate document with the Executive Summary, signed by the Qualified Person, is to be submitted to demonstrate completion of the LMS.

Land Management Strategy template - soil carbon

Proponent and Service Provider details

Proponent: Name of the landowner/s

Strategy Development Team: Name, Role, Business Address, Phone, Email of each Professional Service Provider* who contributed to the development of this LMS.

*Note any familial or business relationship with the landowner as per the CER requirements for independence of advice.

Executive summary

Provide an overview of the farm business and the project to be undertaken.

Include a summary of the project that describes the project location and the high-level objectives that you wish to achieve in running a soil carbon project (Minimum 250 words), such as:

- Goals for the project (environmental, business),
- Overview of the farm (location, current farming activities e.g., broad acre cropping of wheat, cattle, mixed grain and sheep)
- Involvement of the proponent in the farm's past and future planning,
- Description of the last 5 years land management activities and proposed changes,
- Estimated carbon sequestration potential for the project, and
- The soil health and productivity co-benefits.

Property details

- Property address, rainfall zone (Appendix A).
- State the total property area and the project area (in hectares) within the property boundary that is covered by this LMS.
- Insert a property map showing property and project boundaries, co-ordinates, and legend. If you do not have access to an existing property map, you can generate one using the free Carbon Farming and Land Restoration Program Co-benefits Information Portal. Refer to the user guide for tips on how to create and print your map.

Project area and soil types

Information on soil types helps identify the Carbon Estimation Areas (CEAs) on your property. Managing CEAs according to their capacity to sequester carbon may increase productivity and profitability and minimise the risk of losing soil carbon stocks.

- Identify and describe the different soil types found across the project area.
- Insert a project map that illustrates the different soil types using the Natural Resource Information (WA) digital mapping tool.

Baseline period land management activities

The baseline period accounts for the current and previous 5-years activities for the project prior to CER registration. This indicates eligibility and what new activities could be initiated to increase soil organic carbon (SOC).

- Provide detailed technical and operational information on the baseline land management activity(s) in the project area/s i.e., what is being done (e.g., lupins, grazing cattle), details of the location (use maps as appropriate), timing (e.g. every season, every two years, with annual cropping rotation, etc), and frequency of the activity(s).

New and materially different land management activities

For the project to be eligible to receive ACCUs[1], new, and materially different land management activities, as described in the LMS, need to be undertaken. These cannot be started until the project is officially registered by the CER. A list of eligible activities can be found in **Appendix B.**

- Provide detailed technical and operational information on the planned new land management activity(s) planned for the soil carbon project including:
  - the type of new, materially different activity/s planned
  - location of the activity/s (use maps as appropriate)
  - timing and frequency of the activity (e.g. every season, every two years, with annual cropping rotation, etc)
  - identify how and to what extent the proposed eligible activity is materially different (additional) to the activities conducted in the baseline period
  - identify how and to what extent the proposed new eligible management activity/s will increase soil carbon (SOC) above the baseline.

Examples:
It is estimated that increasing the duration of cover crops from 3 months to over 6 months SOC can be increased as it reduces carbon lost to the atmosphere through decomposition during extended hot, dry weather conditions.

Researchers investigated the on-farm benefits of soil carbon accumulation following a transition in land use from cereal cropping to grazed pasture.

Soil organic carbon accumulation was faster in low carbon soils (0.3-0.48 t C / ha / year) compared to their high carbon counterparts (0.02-0.23 t C / ha / year)[2].

The project area is deemed to have low levels of carbon and the transition to permanent pasture /crop pasture rotation is predicted to increase SOC accumulation at an estimated rate of 0.35 t C / ha / year based on current rainfall projections.

- estimate the additional cost to undertake the new activity(s).

[1] Australian Carbon Credit Units (ACCUs)
[2] Soil carbon benefits in grazing systems | Primary Industries Climate Challenges Centre (piccc.org.au)

- identify the provisions you need to consider for timing the activity and operational flexibility, e.g., if seasonal rainfall is below average, you may limit grazing or utilise green manure standing crops.
- identify the permanence period (either 25 or 100 years after the first ACCUs are issued).

Estimated soil carbon sequestration

Online tools and probe technologies can be used to estimate the sequestration potential of the project. These tools can support your understanding of where the CEAs will be located for the project and indicate potential project returns.

- Provide an estimate of the potential amount of carbon to be sequestered by the project over 25 years. This should indicate how much is sequestered in the first 10 years as well. Please note which tool/s were used.

Excluded and restricted activity statement

See **Appendix C** for activities not to be conducted or that are restricted.

- Include a statement confirming activities excluded by **section 11** of the Carbon Credits (Carbon Farming Initiative— Estimation of Soil Organic Carbon Sequestration using Measurement and Models) Methodology Determination 2021 or that are in breach of restrictions in **section 12** will not be conducted.

Example*: I, the project proponent, confirm I am aware of the obligations to act consistently with each of the requirements of s11 and s12, and that the activities excluded by s11 and in breach of s12 are not being conducted or proposed to be conducted.*

- Include a statement confirming whether you are intending to use biochar and/or products containing human effluent as required in **section 13(1)(c)(i)**.

Example: I, *the project proponent, confirm I do not intend to use biochar or any other products containing human effluent in the project area.*

Monitoring and evaluation consideration

For the purposes of this document, “co-benefits” are defined as the environmental, social, or economic benefits arising from a carbon farming project in addition to carbon abatement.

With reference to the Priority Investment Co-benefits Standard:

- Describe the steps needed to monitor and measure how the activity(s) are achieving soil carbon sequestration objectives, soil health and agricultural productivity co-benefits, and the metrics to be used including:
  - Contracting experienced, qualified soil sampling technicians.
  - Planned start date for sampling year 0 baseline (after registration).

- A list of sampling techniques employed and a record of the coordinate system used to ensure repeatability of sampling over the project length.
- GPS location of sampling sites.
- A business operations and seasonally appropriate sampling time to be undertaken at the same time of year for each sampling event, i.e., dry period before opening rains in January. Sampling the soil for SOC stock at the same time each year (preferably before rapid plant growth) minimises the seasonal variation to discern the land-use and management effects on SOC stocks.3
- Analysis of SOC by an ASPAC and NATA certified laboratory.
- Change in SOC reported as % C / ha.
- Sampling, including modelling, completed within every 5-year reporting period after year 0 baseline.

Example: *Soil health metrics may include conductivity, cation exchange capacity, pH, sulphur, phosphorus, potassium, magnesium and nitrogen measured and analysed at the same time as SOC. Laboratory analysis data to be reported. Soil erosion metrics will include satellite imagery (before, during and after) demonstrating increase in groundcover has occurred. Satellite images and independent assessment to be reported. Soil compaction, water repellence and water infiltration rates may also be considered.*

Limiting factor and risk considerations

Consider how other activities being conducted in the project area and environmental factors may limit increases in soil carbon and present risks to maintaining it, for example:

- Soil constraints - acidic soil may limit the likelihood of soil carbon increases.
- Changes in rainfall - drought may be a risk to maintaining soil carbon stocks.
- Liming for yield improvement – liming can impact the rate of carbon sequestration.
- Stubble burning for disease suppression may limit the rate of carbon sequestration.
- Annual emissions from activities in the project area such as emissions from livestock, synthetic fertiliser application, lime application, residue and tillage events and irrigation energy and potential increases.

Risk assessment and permanence considerations

- Describe the risk mitigation activities planned to protect and maintain the soil carbon (ACCUs) credited to the project for the permanence period, for example:
  - Reduce stubble burning
  - Increase cover crop duration during a drought event
  - Reduce or alter tillage strategies (use direct drill, controlled traffic, discs)
  - Manage the risk associated with strategies that break up soil particle aggregation
  - Conservative estimates of SOC

[3] A review of sampling designs for the measurement of soil organic carbon in Australian grazing lands
D. E. Allen, M. J. Pringle , K. L. Page and R. C. Dalal

Qualified person statement (LMS author**)

Provide information outlining the qualifications of the person who prepared and/or reviewed the LMS as per **section 13(8)**:

Business Name,

ABN/ACN:

Address,

Phone,

Email,

Qualifications**,**

Experience,

Professional Memberships,

Acknowledgement of having no financial interest in the project.

**Note: the same person cannot prepare or review the land management strategy and conduct the soil sampling.

Independent person declaration (LMS reviewer/auditor)

As outlined under s13(8)

I (an independent person),

Declare that in my opinion:

(i) activities excluded by s11, or in breach of s12, are not being conducted or proposed to be conducted; and

(ii) (ii) the eligible management activities meet the requirements of paragraph 7(2)(b); and

(iii) (iii) the overall impact of all land management activities conducted on the land could reasonably be expected to improve soil carbon stocks over time.

SIGNED: _____

DATE: _____

Declaration of commitment (project proponent and relevant landholder) to the CER

Declaration of commitment to the Land Management Strategy as outlined in the above document.

I/We (the project proponent and relevant landholders)

Agree to implement, or oversee the implementation of, each land management strategy; and

Take reasonable steps to implement, or oversee the implementation of, the applicable land management strategies until the end of the permanence obligation for the project.

We also agree to engage an independent person S13(8) who:

Will also review, and if necessary, revise, each strategy:

(a) at least once every 5 years until the end of the crediting period for the project; and

(b) at least once every 10 years until the end of the permanence obligation period for the project; and

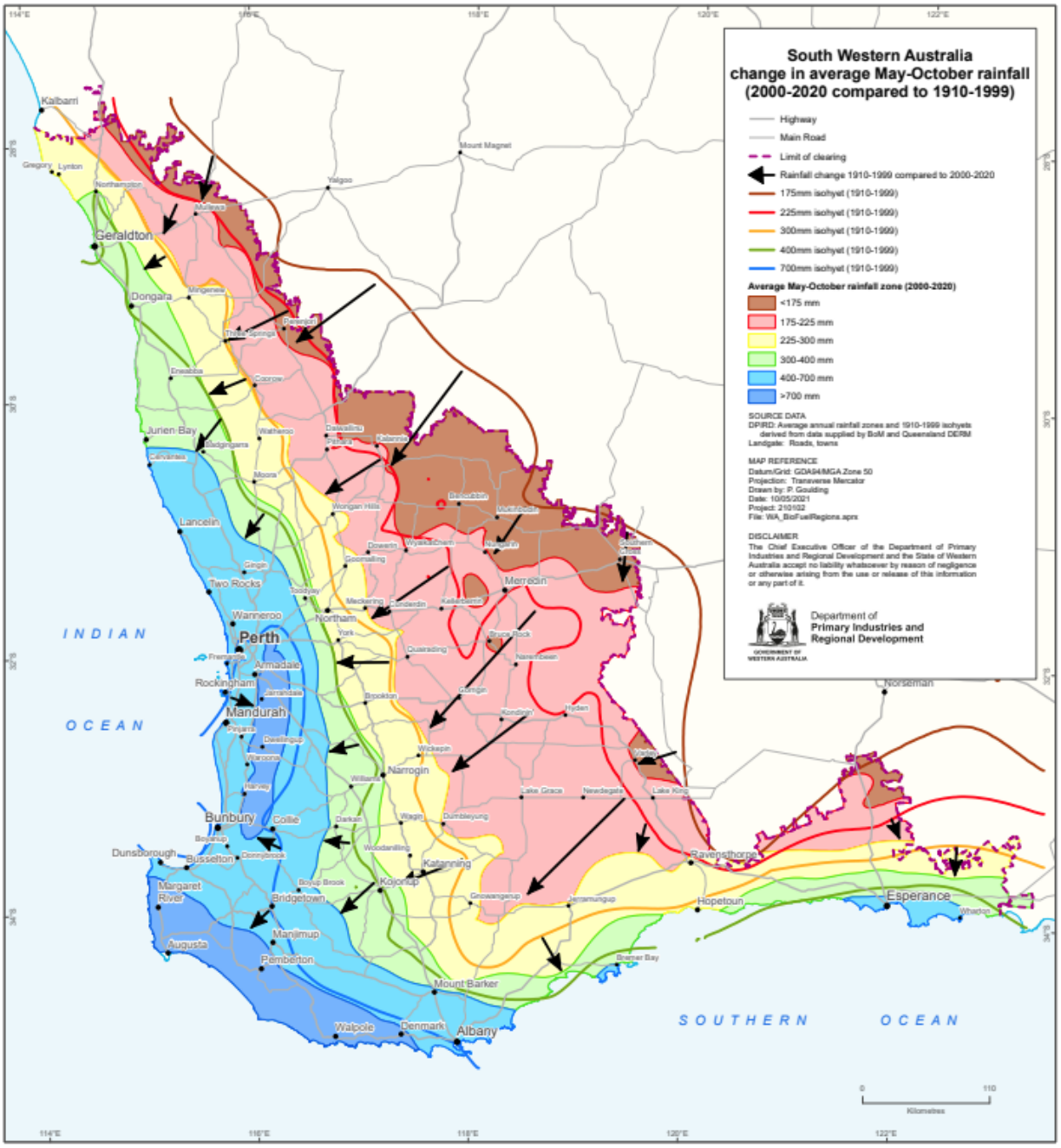
(c) if land management activities being conducted change materially from those outlined in the land management strategy; and

(d) if the Regulator notifies a project proponent that a particular issue needs to be addressed in the strategy—by the date specified in the notification (which must be at least 3 months from the date of the notification).

SIGNED: _____

DATE: _____

Appendix A


South Western Australia
change in average May-October rainfall
(2000-2020 compared to 1910-1999)
Highway
Main Road
Limit of clearing
Rainfall change 1910-1999 compared to 2000-2020
175mm isohyet (1910-1999)
225mm isohyet (1910-1999)
300mm isohyet (1910-1999)
400mm isohyet (1910-1999)
700mm isohyet (1910-1999)
Average May-October rainfall zone (2000-2020)
<175 mm
175-225 mm
225-300 mm
300-400 mm
400-700 mm
>700 mm
SOURCE DATA
DPIRD: Average annual rainfall zones and 1910-1999 isohyets derived from data supplied by BoM and Queensland DERM
Landgate: Roads, towns
MAP REFERENCE
Datum/Grid: GDA94/MGA Zone 50
Projection: Transverse Mercator
Drawn by: P. Goulding
Date: 10/05/2021
Project: 210102
File: WA_BioFuelRegions.aprx
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Kalbarri
Geraldton
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Jurien Bay
Lancelin
Two Rocks
Wanneroo
Perth
Armadale
Rockingham
Mandurah
Bunbury
Dunsborough
Busselton
Margaret River
Augusta
Bridgetown
Manjimup
Pemberton
Mount Barker
Walpole
Denmark
Albany
Narrogin
Merredin
Northam
Esperance
Hopetoun
Ravensthorpe
Norseman
Kilometres

Appendix B

Source: http://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/Understanding-your-soil-carbon-project---Simple-method-guide.aspx

Eligible new activities

(i) applying nutrients to the land in the form of a synthetic or non-synthetic fertiliser to address a material deficiency;

(ii) applying lime or other ameliorants to remediate acid soils;

(iii) applying gypsum to manage sodic or magnesic soils;

(iv) undertaking new irrigation;

(v) re-establishing or rejuvenating a pasture by seeding or pasture cropping;

(vi) establishing, and permanently maintaining, a pasture where there was previously no or limited pasture, such as on cropland or bare fallow;

(vii) altering the stocking rate, duration or intensity of grazing (or any combination of such activities) to promote soil vegetation cover or improve soil health, or both;

(viii) retaining stubble after a crop is harvested;

(ix) converting from intensive tillage practices to reduced or no tillage practices;

(x) modifying landscape or landform features to remediate land;

(xi) using mechanical means to add or redistribute soil through the soil profile;

(xii) using legume species in cropping or pasture systems;

(xiii) using a cover crop to promote soil vegetation cover or improve soil health, or both.

Appendix C

Source: http://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/Understanding-your-soil-carbon-project---Simple-method-guide.aspx

1 Activities not to be conducted

(1) Activities excluded by this section must not be conducted on land that is, or is to be, part of a CEA in the period commencing on the date of the section 22 application for the project and ending at the end of the permanence obligation period for the project.

(2) Land under pasture must not be de-stocked unless:

(a) the land is to be converted to a cropping system; or

(b) the de-stocking period is within the relevant drought period for the land; or

(c) the Regulator agrees in writing that exceptional circumstances exist.

Note 1: Reducing stocking density on land that is, or is to be, part of a CEA is not an excluded activity.

Note 2: Exceptional circumstances may include a disease outbreak among livestock.

(3) After the completion of the baseline sampling round:

(a) land management activities must not disturb the soil any deeper than 10 centimetres above the baseline nominated soil depth;

(b) pyrolysised material that is not biochar must not be applied.

(4) Land management activities must not be conducted on hypersulfidic material that would result in one or more of the following:

(a) drainage;

(b) physical disturbance;

(c) the application of lime to the land.

Note: Project proponents may choose to exclude soils with hypersulfidic material (i.e. acid sulfate soils) from CEAs to avoid the risk of breaching this subsection.

(5) An activity notified to the project proponent in writing by the Regulator under subsection (6) must not be conducted.

(6) The Regulator may notify a project proponent of one or more activities that must not be conducted if:

(a) the Regulator is satisfied that the activity may result in the crediting of non genuine carbon abatement; and

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(b) the Regulator has consulted the project proponent on the need to make such a notification.

(7) In this section, ***relevant drought period*** for any land means the period of time:

(a) commencing when the land is shown as mapped within a region which is recorded on the Bureau of Meteorology's 24-month recent and historical rainfall map, or another equivalent map approved by the Regulator, as having a rainfall percentile ranking as:

(i) serious deficiency (rainfall lies above the lowest five per cent of recorded rainfall but below the lowest ten per cent (decile range 1) for the period 1900-present); or

(ii) severe deficiency (rainfall is among the lowest five per cent for the period 1900-present); or

(iii) lowest on record (rainfall is lowest for the period 1900-present); or

(iv) some combination of clauses (i), (ii) and (iii); and

(b) ending on the date the land is no longer shown as mapped within that region.

Note: As of 17 August 2021, the Bureau of Meteorology's 24-month drought map was available at:

http://www.bom.gov.au/climate/maps/rainfall/?variable=rainfall&map=drought&period=24month&region=nat&year=2021&month=09&day=30

2 Restricted activities

(1) Activities mentioned in this section must be conducted in accordance with this section on land that is, or is to be, part of a CEA in the period commencing on the date on which the section 22 application for the project is submitted and ending at the end of the permanence obligation period for the project.

(2) Woody vegetation may be cleared only if:

(a) any clearing is undertaken in accordance with any applicable regional natural resource management plan and Commonwealth, State, Territory or local government environmental and planning laws; and

(b) at least one of the following apply:

(i) the clearing is to manage woody horticulture crops, as part of standard business operations;

(ii) the clearing is required to manage woody horticulture crop, following a disturbance;

(iii) the clearing is to manage growth of a known weed species as defined in the CFI Regulations;

(iv) the clearing is required to reduce the risk of fire;

(v) the land was not forest cover in the 5 years prior to the lodgement of the section 22 application for the project or the section 29 application for the land.

(3) Thinning of the land is only permitted if:

(a) the thinning is to the extent necessary to comply with Commonwealth, State, Territory or local government environmental and planning laws; or

(b) the thinning is of woody biomass to be used either:

(i) as firewood for personal use and the carbon stock in the land after the thinning would not be more than 5% less than it would have been if the biomass was not thinned; or

(ii) in accordance with traditional indigenous practices or native title rights; or

(c) at least one of the following apply:

(i) the thinning is to manage woody horticulture crop, as part of standard business operations;

(ii) the thinning is required to manage woody horticulture crop, following a natural disturbance;

(iii) the thinning is to manage growth of a known weed species as defined in the CFI Regulations;

(iv) the thinning is required to reduce the risk of fire;

(v) the land was not forest cover in the 5 years prior to the lodgement of the section 22 application for the project or the section 29 application for the land.

(4) Land management activities may involve the addition or redistribution of soil using mechanical means (including through clay delving, clay spreading or water ponding) only if:

(a) the soil is sourced from CEAs that are part of the project; and

(b) sampling is undertaken at a baseline nominated soil depth greater than the depth of any soil:

(i) sourced for the land management activities; and

(ii) added to the soil profile; and

(iii) incorporated through the soil profile; and

(c) the land where any soil is sourced is remediated as soon as is practice

Note: Remediation could involve returning sandy topsoil to a clay pit immediately after the clay is extracted.

(5) After completion of the baseline sampling round, soil amendments containing biochar may be added to soil within a CEA only if:

(a) the biochar was sourced or created from:

(i) CEAs that are part of the project; or

(ii) both of the following are satisfied:

(A) organic matter that previously formed part of a designated waste-stream;

(B) the application of the biochar to the CEA is in accordance with the laws and regulations of the relevant State, Territory or local government;

(b) otherwise—the soil amendments are applied:

(i) if the carbon content of the soil amendments is known—at a rate lower than 100kg of carbon per hectare per calendar year;

(ii) otherwise—at a rate lower than the default carbon content specified in the Supplement, per hectare per calendar year.

(6) After completion of the baseline sampling round, soil amendments containing coal may be added to soil within a CEA only if they are applied:

(a) if the carbon content of the soil amendments is known—at a rate lower than 100kg of carbon per hectare per calendar year; or

(b) otherwise—at a rate lower than the default carbon content specified in the Supplement, per hectare per calendar year.

(7) After completion of the baseline sampling round, restricted non-synthetic fertiliser may be added to soil within a CEA only if it is applied:

(a) if the carbon content of the restricted non-synthetic fertiliser is known—at a rate lower than 100kg of carbon per hectare per calendar year;

(b) otherwise—at a rate lower than the default carbon content specified in the Supplement, per hectare per calendar year.

Note: If a product is a combination of non-synthetic fertiliser and restricted non-synthetic fertiliser, the requirements of subsection (7) apply to the restricted non-synthetic fertiliser.

(8) After completion of the baseline sampling round, irrigation may be applied to CEAs within a project area only if both of the following apply:

(a) disregarding new irrigation, the annual level of irrigation for the project area, or the CEAs within the project area, is not more than 20% greater than the highest annual level of irrigation in the baseline period;

(b) disregarding new irrigation, the 5-yearly total level of irrigation for the project area, or the CEAs within the project area, is not more than 20% greater than the total level of irrigation in the baseline period.