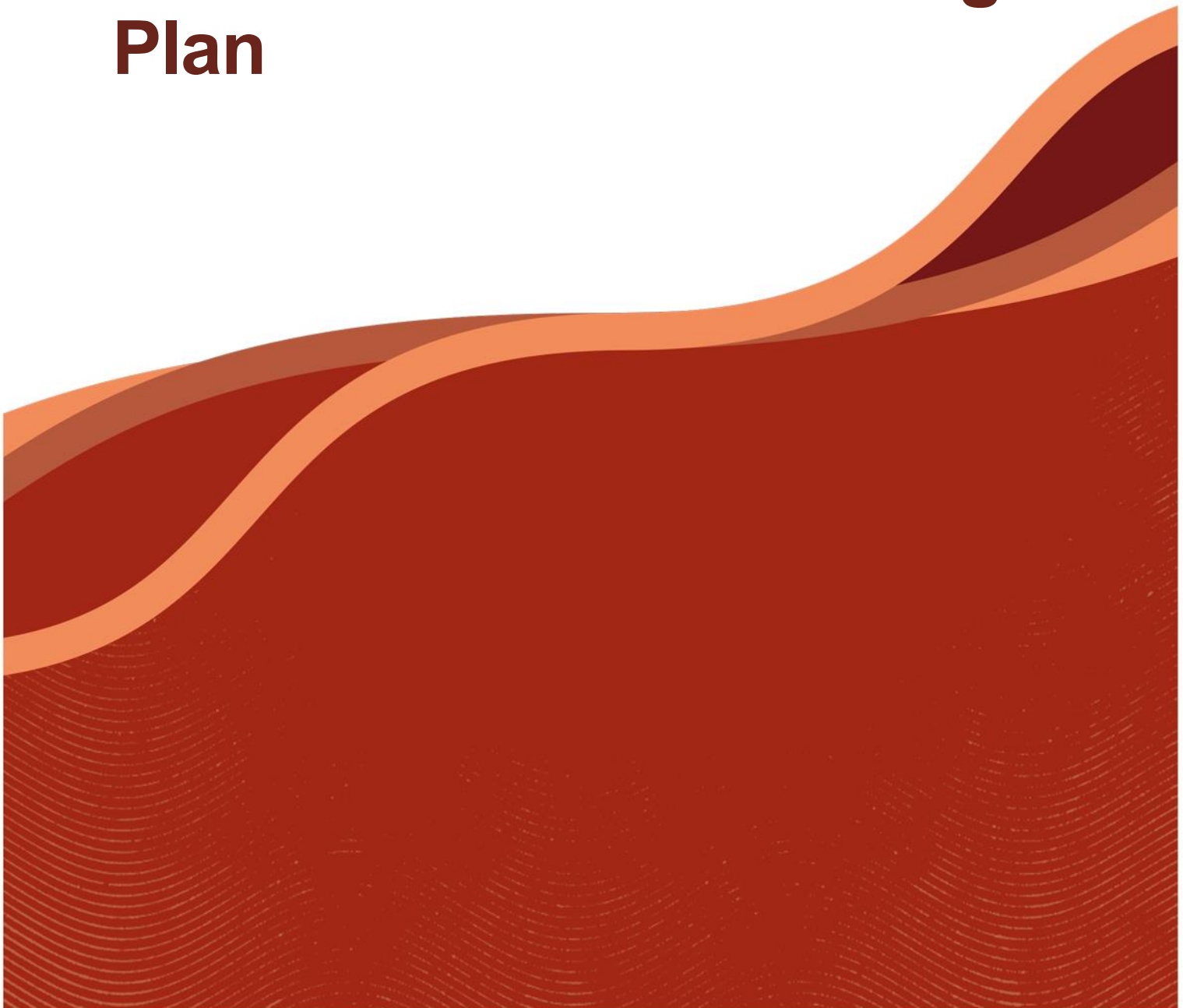




Department of
Primary Industries and
Regional Development

Protect
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Estimating soil organic carbon sequestration using measurement and models method - Carbon Farming Plan



Overview

The Western Australian Government has developed this guideline to assist farmers in the South-West Land Division to develop a Carbon Farming Plan (CFP) for carbon farming projects.

A well-prepared CFP will support the landholder to understand both how to integrate carbon sequestration projects to meet their broader business objectives. The CFP considers the interaction between changing management practices, soil types, climate and other environmental factors, and broader farm system outcomes.

This guideline may be used by landowners with or without the assistance of a professional Service Providers. A more detailed Guidance document outlining further detail on key areas of a carbon farming plan including links to additional information can be found [here](#).

The needs of the individual business must be considered, with additional information included as required, such as financial, legal, agronomic, environmental, and other advice that relates directly to the project.

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

Refer to the Carbon for Farmers Voucher Program Guidelines for more information.

Purpose

The Carbon Farming Plan – *Guidelines for carbon farming projects using soil carbon methods* can assist with the development of a comprehensive Land Management Strategy (LMS) detailing the proposed activities for soil-based carbon farming projects.

A CFP can help farmers determine how carbon farming might fit into existing business operations, the costs and returns you could expect, and what the management, obligations and risks are in developing a carbon farming project.

Land Management Strategies are required by the Clean Energy Regulator when registering a soil project with the ACCU Scheme.

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

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

A CFP may be a useful for farmers wishing to apply for the WA Carbon Farming and Land Restoration Program (CF-LRP) - depending on the level of funding requested, a CFP may be encouraged, or required. More information on the CF-LRP can be found [here](#).

CF-LRP submissions are evaluated by the Department of Primary Industries and Regional Development (DPIRD) to determine the project's potential as an investment under the ACCU Plus funding stream.

Resources

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

Clean Energy Regulator (CER)

- [Soil Carbon Projects](#)
- [Guidance for meeting the requirements of soil carbon land management strategies for 2021 soil carbon projects](#)
- [Understanding your soil carbon project – Simple method guide](#)

Choosing a professional service provider for your project

Landholders are not required to engage a carbon service provider to manage their carbon farming project, however in alignment with the CER, DPIRD advises landholders new to the carbon market and ACCU scheme (formerly the Emissions Reduction Fund (ERF)) to seek professional advice regarding the technical and regulatory aspects of a carbon farming project, in conjunction with financial, legal and tax advice.

There are various arrangements that can be negotiated with service providers including:

1. Do it yourself and hire service providers to assist, on a fee-for-service basis?
2. Project service provider (or agent) managing many or most project activities.
3. Project aggregator or developer who undertakes and manages the project on behalf of landholders.

These are discussed in more detail in [Key Steps – Establishing a Carbon Farming Project](#).

Instructions for using the guidelines

This document provides a guideline with headings and suggested minimum content to develop a suitable CFP. This enables the farmer to achieve registration of the project and apply to the CF-LRP.

Additional information unique to the project can also be included along with other related information which will assist decision making.

A separate guideline has been developed by DPIRD for reforestation carbon farming projects.

Carbon Farming Plan – soil carbon project

Proponent and Service Provider details

Proponent: *Name of the landowner/s.*

Farm/Project: *Name of the farm property, business enterprise or project.*

Permanence Period: *25 years or 100 years*

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

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

Executive summary

The executive summary is written at the completion of the CFP and provides an overview of the farm business and the project to be undertaken.

The summary should describe the project location and the high-level objectives that you wish to achieve in running a reforestation 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,*

Property details

Describe the property where the carbon farming project is planned. Details should include:

- *Property address, rainfall zone ([Appendix A – Rainfall Zones](#)).*
- *State the total property area and the project area (in hectares) within the property boundary that is covered by this CFP.*
- *Insert a property map showing property and project boundaries, co-ordinate, and legend. If you do not have access to an existing property map, you can generate one using DPIRD's Natural Resource Info (WA) [digital mapping tool](#).*

Spatial analysis

Carbon Estimation Areas (CEAs)

Carbon Estimation Area: *Identify the project's CEAs and locations. More information on CEAs can be found [here](#).*

- *Identifying and managing CEAs according to their inherent capability and capacity to sequester carbon may increase productivity and profitability and minimise the risk of losing soil carbon stocks.*

- *Include a property map and a description of soil types and vegetation system/s identified in the project area (use a legend or key).*
- *Existing maps can be included, or you can access maps using DPIRD's Natural Resource Info (WA) [digital mapping tool](#).*

Soil identification: *Identify and describe the different soil types in each CEA.*

- *Mark the different soil types using the digital mapping tool listed above.*

Information on soil types helps identify the CEAs on your property and estimate sequestration potential.

DPIRD's free [Carbon Farming and Land Restoration Program Co-benefits Information Portal](#) has information on both vegetation and soil types. Refer to the [portal user guide](#) for tips on how to create and print your map.

Other desktop analysis: *Include any relevant spatial analysis showing relevant data such as:*

- *rainfall,*
- *topography,*
- *yield,*
- *hydrology,*
- *input/return*
- *co-benefit analyses.*

Sequestration estimates (forward abatement estimate)

Sequestration potential: *Indicate the potential carbon sequestration of your project.*

- *Include plans, maps, reports (e.g., FullCAM report) or self-assessments that indicate the carbon sequestration potential of your project over 25 years,*
- *Indicate how much is sequestered in the first 10 years,*
- *Note which tool/s were used.*

Online tools and probes are available to help estimate the project's carbon sequestration potential and indicate potential project returns.

Baseline period land management activities

Land management activities over the previous: *Outline what the land has been used for in the current and the previous 5 years.*

Provide detailed technical and operational information on the land management activities and usage for each CEA, including:

- *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 activities.*

The baseline period accounts for the years prior to registration of the project and will affect estimation of the sequestration potential. This indicates eligibility and what new activities could be initiated to increase soil organic carbon (SOC).

Project activities

Proposed project activities: Provide detailed technical and operational information on the planned activities including:

- the type of new, materially different activities planned.
- location of the activities (use maps as appropriate)
- timing and frequency of activities (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.
- Estimate carbon emissions from implementing and managing project activities.

For the project to be eligible to receive ACCUs¹, new, and materially different land management activities, as described in the CFP, 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 – Eligible Activities](#).

Examples:

It is estimated that by 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.

Timing of project activities: Identify when each of the listed activities are planned.

Including:

- expected commencement and completion dates e.g., how many years the program will be implemented over:

¹ Australian Carbon Credit Units (ACCUs)

² [Soil carbon benefits in grazing systems | Primary Industries Climate Challenges Centre \(piccc.org.au\)](#)

- *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.*

Cost benefit analysis

Service providers should base any feasibility advice given to a farmer about a carbon farming project on:

- the requirements of the selected method(s),
- individual farmer/client's circumstances that should include:
 - cost estimates involved in the establishment of the project and ongoing maintenance and management costs.
 - initial account and reporting costs.
 - ongoing report and audit schedule and estimates of these associated costs.
 - report of the project carbon sequestration at each reporting period.
 - forecast of ACCU prices and the impact of future revenue.
 - *cost/benefit analysis that includes the Net Present Value (NPV) of the projected returns after 25 years.*

Excluded and restricted activities and approvals

Excluded and restricted activity statement: *Include a statement confirming that activities restricted in **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.*

See Appendix C – Ineligible Activities for activities not to be conducted or to be restricted.

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.

Section 13 Statement: *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 / do not intend to use biochar or any other products containing human effluent in the project area.

Approvals and permits: *List any approvals or permits required for the project and/or project activities, and their status.*

- *Include local or State government approval or permits. This may include, but not limited to local planning approvals and notice to drain or pump water.*
- *State if approval has already been granted or in the process of being approved.*
- *If approvals will be applied for at a later stage of planning, indicate when this will occur where possible.*

Monitoring and evaluation consideration

Co-benefits: *List the co-benefits relevant to your carbon farming project.*

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.

Some additional resources on co-benefits can be found here:

- [Accounting for Nature framework](#)
- [Co-benefits Standard](#)

Identify the co-benefits, categories and criteria to be delivered by your project:

- *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.*
 - *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.

DPIRD have a [Soil carbon measurement and analysis factsheet](#) that may be a useful reference.

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

Risk Assessment: *Detail your risk management plan.*

*Risks can be listed in a table - See **Appendix C** for a risk matrix and guidance table you can use to assess risk, consequence, likelihood and an evaluation of risk acceptance.*

Identify and include:

- *potential risks to the delivery of your project, including any potential negative environmental, community, or economic impacts that may be caused by your project (e.g., adverse impacts on neighbouring properties,*
- *the probability and effect of those risks eventuating,*
- *mitigation actions that you will implement, such as:*
 - *Reduce stubble burning.*
 - *Increase cover crop duration during a drought event.*
 - *Reduce or alter tillage strategies (use direct drill, controlled traffic, discs)*
 - *Risk associated with strategies that break up soil particle aggregation.*
 - *Conservative estimates of SOC*
- *permanence considerations.*

Risks that remain high after mitigation/control actions have been implemented should be considered as significant limiting factors to successful delivery of the proposed activities.

Landholders will need to assess the risk profile of their project and make decisions on what they are prepared to accept and manage over the life of their project given their resources.

Qualified person statement (CFP author**)

Provide information outlining the qualifications of the person who prepared and/or reviewed the CFP 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 Carbon Farming Plan and conduct the soil sampling.*

Independent person declaration (CFP reviewer/auditor)

As outlined under s13(8)

I (an independent person),

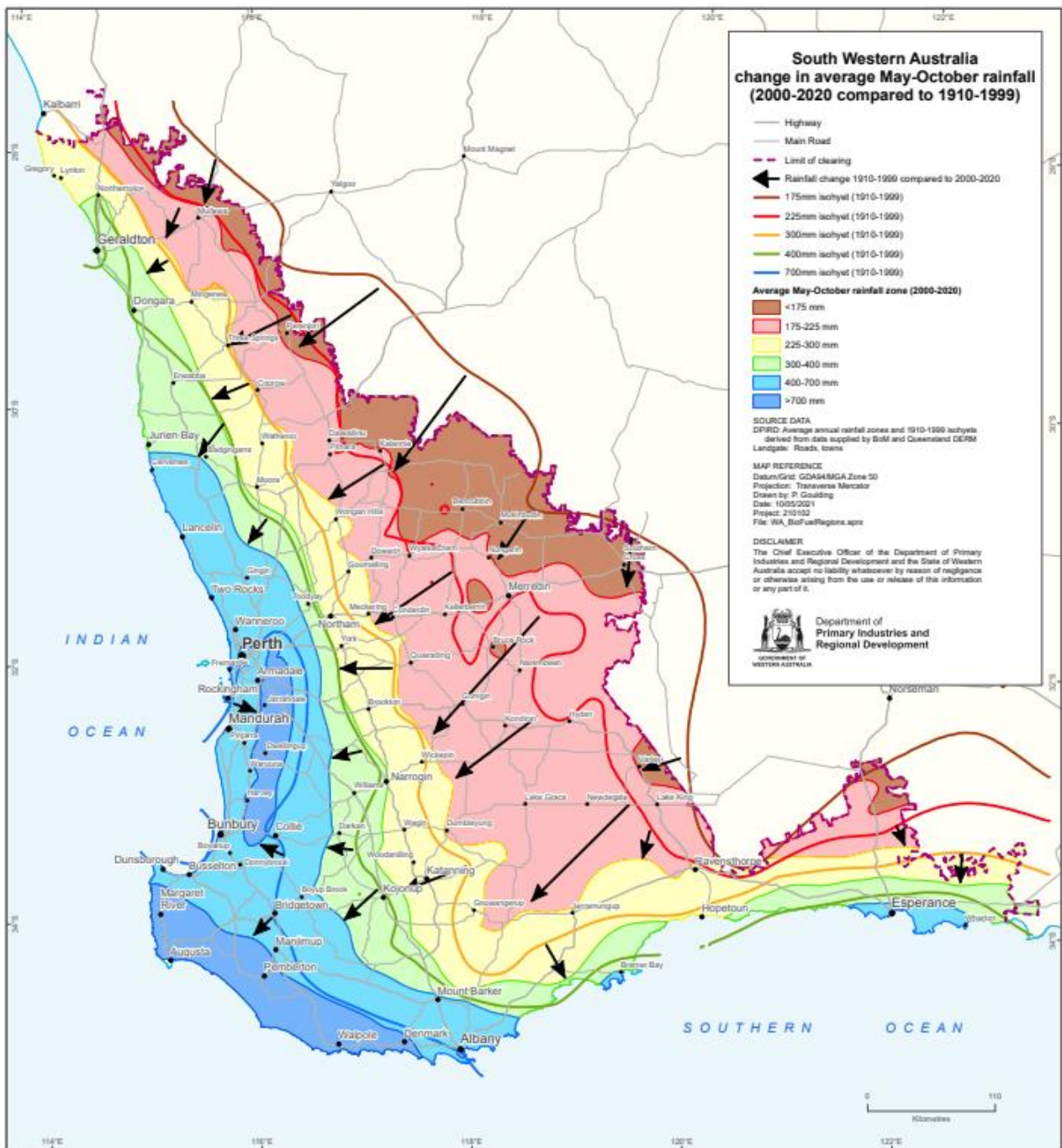
Declare that in my opinion:

- (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: _____

Appendix A – Rainfall Zones



Appendix B – Eligible Activities

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 magnesian soils.
- (iv) undertaking new irrigation.
- (iv) re-establishing or rejuvenating a pasture by seeding or pasture cropping.
- (v) establishing, and permanently maintaining, a pasture where there was previously no or limited pasture, such as on cropland or bare fallow.
- (vi) 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.
- (vii) 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 – Ineligible Activities

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) pyrolysed material that is not biochar must not be applied.
- (4) Land management activities must not be conducted on hyper sulfidic 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 hyper sulfidic material (i.e. acid sulphate 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

Note: Actions which directly or indirectly increase the value of or reduce the value of E_{net} result in additional crediting under the Act. Non-genuine carbon abatement could include activities which increase crediting under this determination without a corresponding overall benefit from the removals or reduced emissions, such as through leakage.

(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®ion=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 under 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 under 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.

Important Disclaimer

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