17th of April 2025

SUBMISSION

Emissions Reduction Assurance Committee (ERAC)
Department of Climate Change, Energy, the Environment, and Water (DCCEEW)
GPO Box 2013
Canberra ACT 2601
Australia

email: ACCUSecretariat@dcceew.gov.au

Dear Emissions Reduction Assurance Committee Secretariat,

Re: DCCEEW's Periodic Review of the Soil Organic Carbon Method 2021

Cattle Australia (CA) is the national peak industry body representing the interests of grass-fed beef cattle producers, providing a unified voice, industry leadership and policy direction. Our industry has much to be proud of with the national herd approaching 28 million head and 52,000 businesses, supporting 428,000 jobs, including processors, exporters and truck drivers. Cattle producers are the stewards of over 50% of the Australian landmass protecting and enhancing economic, social, cultural and environmental values for future generations.

CA has provided feedback to DCCEEW's periodic review of the Soil Organic Carbon Method 2021 and consultation paper. Please find CA's explication against the Offsets Integrity Standards (OIS), as well as recommendations for usability and other improvements for the SOC Method 2021. CA's main recommendations in response to DCCEEW's periodic review of the Soil Organic Carbon Method 2021 are:

- All of the eligible activities and soil carbon projects entered into under the SOC Method 2021 must be considered additional and eligible for future ongoing crediting under the scheme
- Due to soils' intrinsic role in the provision of ecosystem services, any activities undertaken by a producer to improve soil health are directly performing a public benefit for all Australians
- It is necessary for accounting measures and climate metrics to be improved to appropriately consider the cyclical nature of the biogenic carbon cycle as part of GHG emissions reporting. Further research must be undertaken on the role of on-farm removals through soil and vegetation sequestration, and the high potential for carbon

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sequestration in cropland, grassland and soils. This can be used to then guide future updates and variations of any methodologies in the long term

- The continuation of the SOC Method 2021 is vital to foster the substantial abatement potential of Australia's land use, land use change and forestry sector (LULUCF), which will contribute to the integrity of Australia's national greenhouse gas inventory, and international reporting obligations
- Any potential future updates or variations to the method must be supported by peer-reviewed evidence in conjunction with field trials and producer-led projects and follow a participatory process
- Successful projects are practicing the integrated management of multiple eligible activities, and a holistic (not individualistic) approach must be undertaken when viewing these eligible activities in SOC sequestration
- The SOC Method 2021 uses scientifically rigorous metrics and methodologies in accounting for material greenhouse gas emissions, as well as several safeguards around conservativeness to reinforce the integrity of the method
- The SOC Method 2021 is a high-integrity carbon credit scheme that is a critical methodology for Australian producers, and must remain a permanent methodology in the Australian Carbon Credit Unit Scheme

The grass-fed cattle industry is committed to continuing our long-term approach for low emissions pathways and participating in methodologies that support agricultural best-practice management, but requires (*at a minimum*), a long-term commitment from government to the health, wealth, and prosperity of our livestock industry (*in all its forms*).

Thank you for the opportunity to provide this submission for your consultation.

Yours Sincerely,

Dr Chris Parker

Chief Executive Officer

Cattle Australia

Cattle Australia's Submission to DCCEEW's Periodic Review of the Soil Organic Carbon Method 2021

Introduction

CA supports and advocates for the tens of thousands of grass-fed beef producers across Australia who are committed to optimising efficiency within their farming enterprises, as well as achieving successful results in agricultural best-practice management and environmental outcomes.

Soil is considered the most complex biomaterial on the planet, due to its unique composition of organic matter, minerals, water, air, and it's role as an environment for billions of bacteria, fungi and living organisms.[1] Soil provides a range of ecosystem services, including the growth and development of plants, the purification and facilitation of the water cycle, and it's critical role as a carbon sink in the biosphere.[2] Globally, majority of the main taxonomic soil groups have been rated as only being in fair, to poor condition, and Australian producers have another layer of complexity to the management of soils, as Australian soils are typically categorised by deep weathering and leaching, and in some regions, low nutrient availability. Today, seventy-five percent of Australian soils have multiple constraints that limit agricultural productivity.[10]

The Soil Organic Carbon (SOC) Method 2021 is a critically important methodology for Australian producers to undertake eligible activities to build and increase SOC in their soils, as well as diversifying their on-farm income streams. To date there have been over 712 registered soil projects under the method, and thousands of Australian Carbon Credit Units (ACCU's) issued for soil carbon sequestration under the scheme.[48] CA supports and recommends the continuation of The SOC Method 2021 and any further measures that will improve upon its adoptability and applicability for Australian producers.

It is fundamental to acknowledge in the context of CA's submission, that due to soils' intrinsic role in the provision of ecosystem services, any activities undertaken by a producer to improve soil health are directly performing a public benefit for all Australians.[3] On account of this, Cattle Australia calls upon the Clean Energy Regulator to ensure Australian producers are issued with both Australian Carbon Credit Unit (ACCU's) for participating in the SOC method, as well as certificates through the Nature Repair Market for the multi-faceted role of soil in providing ecosystem services. Government, industry bodies, academics, and the general public must recognise Australian producers' role as the stewards of our soils and landscapes.

Assessment against the Offsets Integrity Standards

1. Additionality

A method should result in carbon abatement that is unlikely to occur in the ordinary course of events (disregarding the effect of the Act)

The process of adaptation and innovation is not a new phenomenon to Australian producers, who for generations have managed high seasonal variability by adopting new technologies and management practices and have become more resilient to climate change and the challenges it brings to our agricultural sector. [4]

However, it is important to acknowledge that the process of adaptation and adoption of new methodologies and practices are influenced by a myriad of social, economic, and environmental factors, and in majority of cases, the uptake and adoption of methodologies and practices occurs over longer time periods.

It is focal to highlight that while the eligible activities under the SOC method 2021 are examples of best practice management, all of the eligible activities are not established practice nor highly probable to occur in the ordinary course of events across Australian agricultural communities. It is also critical to acknowledge that where some of the listed eligible activities have seemed to increase in coverage, and would be considered 'established practice', (and an Asterix has been used to demonstrate this) it is highly dependent on a plethora of social, economic and environmental factors, and have several caveats, that will be detailed below:

Table 1: Eligible Activities under the SOC Method 2021, and their Application in Australia

SOC Method 2021 Eligible Activity	Established Practice?	Evidence of Practice in Australia
Applying nutrients to the land in the form of a synthetic or non-synthetic fertiliser (from eligible sources) to address a material deficiency, for example, applying compost or manure	**NO***	While Australia's consumption of fertiliser is low when compared to the global fertiliser market, in 2016-2017, 57,300 agricultural businesses applied 5 million tonnes of fertiliser to 50 million hectares across Australia.[5] Current statistics show that despite significant fertiliser price increases since 2020, Australian farmers are still applying fertiliser at the same rate.[6] It is important to note that the use of non-synthetic soil amendments (while increasing) is still not an established practice, and other carbon-rich soil

		amendments such as mulch, compost and biochar have low rates of adoption due to current costs and scalability concerns. [7]
Applying lime to remediate acid soils	**NO**	While 33% of Australian agricultural businesses use lime as a soil amendment on their properties, annual soil acidification rates are increasing across Australia.[5] Lime use in Australia has been below the estimated lime requirement, in part due to increased costs limiting the application rates.[8] Research has called for further broadscale scale adoption and higher application rates to fully amend acidic soils.[9]
Applying gypsum to remediate sodic or magnesic soils	**NO**	Gypsum is another soil enhancer used in Australia, but it's application is used less than lime.[5] Gypsum is a key ameliorant in the management of sodic soils, but there are significant barriers facing producers in the required frequency of gypsum applications, and the slow economic productivity return on investment, most evident in the management of subsoil sodicity.[10,11]
Using water savings from within the project area to undertake new irrigation	**NO**	Due to the favourable climatic conditions of three consecutive years of La Niña events, Australian producers increased their irrigated cropping ventures from 2020 onwards.[12] On-farm irrigation technologies require significant capital expenditure, as well as continual operating and maintenance costs.[13] The Australian Government has provided funds and created schemes such as the 'On-Farm Irrigation Efficiency Program' which assisted irrigators to invest in more productive irrigation technologies, due to the chance of investment occurring without government mechanisms less likely.[14]
Re-establishing or rejuvenating a pasture by seeding or pasture cropping	**NO**	While sod-seeding of pastures has been practiced since the 1960's, pasture cropping in its most current iteration has been undertaken since the 1990's.[15] Pasture cropping is the practice of sowing winter cereal crops into summer active perennial pasture.[16] Pasture cropping is not an established 'business as usual' practice, with a small percentage of 2,000 farmers

		having adopted the practice across Australia.[17] Pasture cropping has multiple benefits to a farming system, such as increasing soil carbon levels and nutrient and moisture holding capacity.[15] However, there can be inadvertent affects to farmers undertaking pasture cropping such as yield penalties from retaining perennial grasses compared to conventionally grown crops, as well as increased weed pressure, and the significant time periods needed to witness soil improvement from pasture cropping.[16]
Re-establishing, and permanently maintaining, a pasture where there was previously no or limited pasture, such as on cropland or bare fallow	**NO***	The Australian Bureau of Statistics (ABS) estimated that 23,700 agricultural businesses managed perennial pastures in 2013-14.[5] While permanent pastures are gaining in popularity due it's contribution for livestock production and profitability over the long term, there has been research undertaken by Meat and Livestock Australia (MLA) that show that the opportunities for reducing costs of pasture establishment are limited and often outside of the control of producers.[18]
Altering the stocking rate, duration or intensity of grazing to promote soil vegetation cover and/or improve soil health	**NO***	According to the Australian Bureau of Agricultural and Resource Economics, a considerable number of producers across Australia employ some form of grazing management system, such as cell, strip or rotational grazing.[19] However, while this management system has become widespread in Australia, it is important to note that it's actual practical implementation is fundamentally flawed.[20]
Retaining stubble after a crop is harvested	**NO***	While it has become an established practice to retain stubble since the 1980's, and to date most broadacre cropping farms retain stubble in Australia, there have been recent documented resurgences in the burning of stubbles.[21,22,23] The percentage of growers engaging in the burning of whole paddocks in 2014 was documented as 52% in southern Australia, 40% in western Australia, and 12% in northern Australia.[24] It is important to

		highlight that stubble burning is highly seasonal dependent and influenced by a number of economic factors.
Converting from intensive tillage practices to reduced or no tillage practices	**YES**	Elements of conservation agriculture gained interest in the 1960's, with the first explorations of minimum/no-till being practiced. The success of minimum/no-till in Australia today is heralded as the ultimate success story and is the most widespread established practice contributing to soil health with 68% of farms practising some variant of minimum tillage.[19] However, it must be noted that the success and widespread adoption of minimum/no-till practices occurred over a substantial time period, coupled with a myriad of opportune social, economic and environmental factors that facilitated its success.[25]
Modifying landscape or landform features to remediate land, including practices to address soil erosion, surface water management, drainage/flood control, or alleviating soil compaction	**NO**	Farmers are important agents of rural landscape management as they modify landscape elements to suit their needs.[26] There is no current available data to provide information on farmers undertaking landscape modifications, nor soil erosion, surface water management, flood control and soil compaction mitigation activities, indicating it's low adoption rate. It is however important to draw attention to that soil erosion and soil compaction continue to remain ongoing significant management issues for Australian producers.[27,28]
Using mechanical means to add or redistribute soil through the soil profile, for example, through clay delving or clay spreading	**NO**	The careful management and amelioration of sandy soils is crucial for many regions within Australia. Sandy soils can have multiple constraints, and mechanical mechanisms such as clay delving or clay spreading can overcome water repellence and increase the fertility of sandy soils.[29] However, to date, while clay spreading and/or clay delving is considered best-practice management, this practice has had low rates of adoption with the total area treated for clay spreading and/or delving in Australia, to date, is only 4,000 hectares. There are associated barriers with sourcing expertise to undertake such mechanisms, as

		well as the delays in producers recouping initial costs.[30]
Using legume species in cropping or pasture systems	**NO**	Before the introduction of reduced tillage systems and modifications to seeding equipment and herbicides, most Australian farms were mixed farming systems consisting of crops and legume-based pastures on rotation. The intensification of many cropping systems saw the reduction of legumes in many systems, which contributes to a decline in nitrogen.[31] While the incorporation of legume species in cropping and pasture systems has increased over time, it is important to note that adoption is constrained in many regions of Australia due to high costs with establishment, coupled with unpredictable seasonal rainfall.[32] Farming operation costs have only increased over time, and it is evident in a notable decline in legume plantings globally.[33]
Using cover crops to promote soil vegetation cover and/or improve soil health	**NO**	While many producers across Australia have become more aware of the long-term necessity for consistent groundcover within their operations, the use of cover cropping is gaining traction, but still does not have widespread adoption in Australia.[19] The low adoption of cover cropping in Australia can be attributed to the costs of establishment, yield variability, and Australia's climatic conditions limit the choice of cover crops suitable between cash crop rotations.[34,35]

This table has shown how majority of the eligible activities under the SOC Method 2021, while they can provision an increase in soil organic carbon stocks, do not have widespread effective applicability in Australian farming communities. The majority of these management practices are bound by significant constraints, and influenced by an absolute plethora of social, political, and economic components. CA acknowledges all of the important eligible activities and their role in improving soil health, delivering ecosystem services, and increasing agricultural yields. It is important to note that successful projects are practicing the integrated management of

multiple eligible activities, and a holistic (not individualistic) approach must be undertaken when viewing these eligible activities in SOC sequestration.

1.1 Behavioural Additionality

Cattle Australia will also discuss behavioural additionality in the context of the submission, as for too long, the critical human dimensions of management decisions and outcomes have been overlooked in favour of technical assessments and prescriptions, and the concept of behavioural additionality has not been widely used within the international environmental policy community.[36]

There are many assumptions that farmers' decision making is purely influenced by economic rationality; however, other factors such as associated risks, applicability, and time and effort associated to implement a certain measure, were found to be equal if not more important than economics. Natural resource management programs and methodologies that consider and combine the economic, social, and ecological requirements of producers are considered the most valuable.[37,38]

The psychological characteristics of producers are pivotal in the adoption of natural resource management measures and programs, and the success of such initiatives rely on the changing of behaviours and practices.[39,40] Achieving behavioural change and practice change away from traditional, business-as-usual agricultural practices presents significant challenges and time constraints for policymakers, extension officers and peak industry bodies.

It is well documented in literature that Australian regional farming communities are highly interconnected, and majority of producers are acutely aware when their peers divert from standard agricultural practices and implement new methodologies. Existing socio-cultural attitudes towards agricultural practice can hinder adoption, and there are even instances where community members have employed a system of social sanctioning and peer pressure to shame producers and farm managers undertaking new activities.[41,42,43,44] Behavioural additionality is a significant unseen factor to be considered, for many producers and farming managers across Australia face undue social costs and barriers when adopting such methodologies. It is important to note that the very concept of additionality is inherent in behaviour change, because the transformation in worldview and thinking that is required to succeed in new agricultural practices after following 'business-as-usual' or 'conventional' management styles, the change process should be conceptualised as a type of transformational adaptation.[45,46]

While there is no universally agreed upon precise definition of what additionality means or how to best implement it, there are conceptualisations that additionality is ensuring that projects or activities would not have occurred without the incentives provided by carbon credits or other mechanisms, or whether a proposed activity will produce some "extra good" in the future relative to a reference scenario.[49,50] CA calls upon the department to recognise that it is critically important that all of the eligible activities and soil carbon projects entered into under the SOC Method 2021 are to be considered additional and eligible for future ongoing crediting under the scheme, and to not commit a false negative error that can occur in offset programs in the assessment of additionality, where *(truly additional activities are incorrectly rejected)*.[49]

2. Measurable and Verifiable

Estimates of abatement should be measurable and capable of being verified

CA supports that methodologies that cover removals, sequestration, and emissions must be measurable and capable of being verified. CA calls upon the department to better improve accounting measures and climate metrics, in the longer term, to appropriately consider the cyclical nature of the biogenic carbon cycle as part of GHG emissions reporting at business, industry and sector levels. There is currently limited research on the highly variable GHG fluxes within the agricultural and forestry sectors, as well as the role of on-farm removals through soil and vegetation sequestration, and the high potential for carbon sequestration in cropland, grassland and soils is also fundamentally under-researched.[51,52]

The SOC Method 2021's provisions for measuring and verifying abatement estimates are fit for purpose, and scientifically credible, considering the methodologies and metrics currently used. The SOC Method 2021 uses a measurement and modelling approach to the measurement of soil carbon, and samples to rigorous standards from 30cm, and recommends sampling to deeper soil (e.g. 1 metre) for the true accurate representation of soil organic carbon content in the soil. CA supports the continuation of the SOC Method 2021, and any new technologies currently not included in the SOC method 2021 that will add accuracy and reduce measurement costs for producers. The establishment and continuation of flux tower measurements, remote sensing, and direct SOC measurements will significantly advance the understanding of SOC and greenhouse gas dynamics, and as recent studies have shown,[53] can decouple the impact of management and climatic conditions on increases in SOC, the main concern of the Mitchell et al. (2024) paper.[54]

The SOC Method 2021 is a compelling catalyst for agricultural innovation, and this method provides an opportunity for soil carbon sequestration to become a viable source of income for producers across Australia, while in conjunction, protecting Australia's soil resources. Any changes to the method must be considered in the context with the continual growth of this method, the method must not be suspended, nor any projects postponed with any updates or improvements to the methodology. CA supports the SOC Method 2021 to continue to enable producers to demonstrate the benefits of the co-existence of beef production with landscape, soil, and biodiversity outcomes.

3. Eligible Carbon Abatement

A method should provide abatement that is able to be used to meet Australia's international mitigation obligations

The storage of carbon in soil and woody biomass is currently the only proven technology to drawdown carbon from the atmosphere, at a significant scale. The continuation of the SOC Method 2021 is vital to foster the substantial abatement potential of Australia's land use, land use change and forestry sector (LULUCF).[55] As discussed prior in section 2: measurable and verifiable, there must be improvements to the accuracy of existing models, including the modelling of carbon stock changes in Australia's unique landscapes. This will provide further confidence and transparency in the accuracy of abatement estimates and contribute to the integrity of Australia's national greenhouse gas inventory, and Australia's international reporting obligations and emission reduction commitments.[56]

4. Evidence-based

A method should be supported by clear and convincing evidence

The SOC Method 2021 is scientifically credible and is supported by a superfluity of scholarly evidence. Potential future updates or variations to the method must also be supported by peer-reviewed evidence in conjunction with field trials and producer-led projects.

There have been appeals for more participatory processes in natural resource management since the early 2000's; there must be a focus on how producers, scientists, agricultural advisors, and government departments can collaborate to create a process of knowledge co-production leading to adoption of the method in question, rather than the traditional *modus operandi* of a top-down transfer of knowledge from researchers to producers.[37, 57]

5. Project Emissions

Material greenhouse gas emissions emitted as a direct result of the project should be deducted

CA supports that the SOC Method 2021 sufficiently accounts for material greenhouse gas emissions directly resulting from carrying out the methodology. The associated equations with the SOC Method 2021 properly account for material greenhouse gas emissions, as well as reflecting the change in project emissions from the baseline in a reporting period. The equations also account for when project emissions in the project area during the reporting period exceed average project emissions levels during the baseline period for the project area.[58]

6. Conservative

Where a method involves an estimate, projection or assumption, it should be conservative

The SOC Method 2021 has several safeguards around conservativeness to reinforce the integrity of the method, and it is the opinion of CA that these measures are exceedingly conservative. There are four existing discounts that already reduce the risk of overestimating stored soil organic carbon and the over-crediting of ACCU's:

- specified probability of exceedance
- temporarily withheld ACCU credits from the first reporting period (25%)
- risk of reversal buffer (5%)
- permanence obligations (25 or 100 years)[59]

The Mitchell et al. (2024) paper stated that the withholding of 25% of ACCU credits from the first reporting period are unlikely to account for climate variability and discussed how the SOC gains measured in 2023 were largely attributable to above-average rainfall rather than project interventions. However, CA would like to bring to attention the on-the-ground actuality and constraints facing Australian producers, with the paucity and variability of Australian rainfall, and effective rainfall, moreover, *(the portion of total rainfall that is actually available for plant use and soil infiltration)* and the difficulty of measuring small changes in SOC stocks.[60]

It is also important to acknowledge the vast spatial and temporal variation of Australian soils, as well at their variable sequestration properties, making their modelling and management for Australian producers extraordinarily complex.[61] CA does not diminish the significant impact that rainfall contributes to increasing SOC, however, extreme rainfall events can have an adverse effect to SOC stocks, and cause SOC loss, and extreme weather events are only set to increase with the effects of climate change.[62] The quantity of carbon sequestered within soil is

intricately shaped by a constellation of factors, including climate conditions, vegetation cover, agricultural and land management practices, soil composition, and groundwater levels.[63] The SOC Method 2021 is inherently conservative, and there must be further research to support integrated models that capture all the factors that influence soil management, to provide better outcomes for Australian producers and the diverse landscapes they manage. [64]

Usability and other Improvements

> "*It is not fair and reasonable in these circumstances to claim the landholders are now primarily responsible for the cost of soil conservation*" [47]

CA welcomes the opportunity to provide additional information to improve the SOC method 2021, with recommendations to improve its usability and encourage uptake. CA supports the research undertaken by Pudasaini et al. (2024) who identified several barriers to the uptake of soil carbon projects and builds upon their recommendations:

- Enhancing awareness and access to science-based information
- Lowering risk and uncertainties for Australian producers
- Decreasing measurement and practice change costs
- Increasing financial support and incentives for Australian producers undertaking soil carbon projects
- Simplifying methods and program systems and reducing administrative burdens on Australian producers
- Quantifying environmental benefits and co-benefits of carbon farming practices (sustainability and profitability)

CA calls for the SOC Method 2021 to remain a permanent methodology in the Australian Carbon Credit Unit Scheme, and if there are any updates or variations to the method subject to new knowledge, this must be generated from producers, scientists, agricultural advisors, and government departments. CA recognises the SOC Method 2021 as a high-integrity carbon credit scheme that is a critical methodology for Australian producers to foster soil stewardship across their farming landscapes.

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