SUMMARY OF PUBLIC CONSULTATION

VM0047 Methodology for Afforestation, Reforestation, and Revegetation, v1.0

A draft of Methodology for *Afforestation, Reforestation, and Revegetation* was open for public consultation between 17 December 2021 to 28 January 2022. This document includes a list of each comment received and the developer's response.

GENERAL FEEDBACK

Section 2 – Summary Description of the Methodology

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#	Organization	Comment	Developer's Response
1	Conservation International	Section 2 states that, "The performance benchmark is calculated from ex-ante observations of business-as-usual transitions from non-forest to forest cover in areas comparable to the project area." Based on the of the PB in Section 6 (p. 11) [AB1] and Appendix 1 as "the businesses-usual rate of establishment of new vegetative cover and productivity relative to the project" and the description provided in the webinar, PB not only includes non-forest to forest transitions but also includes non-forest vegetation dominated land cover transitions AND increases in "vegetation stock" (i.e., biomass). The text in Section 2 should be changed to reflect this and avoid confusion	Text in Section 2 amended.

Section 2 – Summary Description of the Methodology			
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2	Conservation International	What about baselines that are not agroforestry, but small-scale subsistence agriculture and the baseline is an annual crop. The project is agroforestry or small woodlots that will be difficult to measure with traditional plots, can this also be considered for the census approach?	Yes. This is exactly the kind of activity the census-based approach was designed to accommodate.
3	Conservation International	Why make the area based and census-based approach mutually exclusive? The same project may plant scattered trees and woodlots, is it possible to allow projects to use both and account for carbon using each approach and then combining?	Methodology amended to allow combining approaches in geographically separate areas.

Section 4 – Applicability Conditions

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4	Conservation International	Is the methodology applicable in situations where the baseline is degraded forest or only where the baseline has already changed to non-forest? Would this fall under regeneration? If the latter only it will exclude large numbers of initiatives to restore degraded forests and they will be forced to apply REDD methodologies which are not a good fit for ARR. Please clarify.	The methodology deliberately does not reference a forest definition, and this allows for accounting just the scenario you describe. Many areas were ARR activities will be directed may already meet a national forest definition (especially those countries where minimum canopy cover is set to 10%).

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5	Conservation International	The definition of wetland combined with organic soils is confusing. Some project proponents only consider wetlands as areas with organic soils. It is important that the definition of wetland must be 6explained better to remove any ambiguities. The intention is to stop planting of trees in all wetland areas, regardless of whether they have organic soils or not. There is a need to provide clarity regarding the above point other than those likely to have occurred under historic natural conditions. 1. Are the rules regarding manipulation of the water table only relevant if there are organic soils or wetlands in the project area? Or do the rules regarding water table manipulation apply in all cases? 2. Are there any restrictions to reforesting degraded drained wetlands? These areas may provide essential freshwater functions and should be considered as wetland restoration areas rather than for afforestation, which would increase transpiration and potentially exacerbate water issues. 3. Regarding manipulation of the water table and hydrology: a. If project activities were to include fast-growing species known to have	The applicability condition is not meant to "to stop planting of trees in all wetland areas, regardless of whether they have organic soils or not.", it is meant to exclude project activities which increase CO2 and methane emissions from soils (which are not treated). The applicability condition has been clarified to reference the IPCC definition of wetlands. Re excluding ARR activities that manipulate hydrology by planting e.g., a non-native "naturalized" tree species with high water consumption, the act of planting these species intuitively makes it "deliberate." You can still plant trees on wetlands and use the methodology, but only, as stated, species likely to have occurred under historic natural forest conditions in the project area, ensuring that species used are characteristic of forested wetlands and would not significantly alter site hydrology (whether raising or lowering water tables). Applicability conditions cannot be monitored, so no monitoring is involved, hence the focus of this ex-ante evaluation on tree species (not water consumption). The first sentence of the condition is clear - water table manipulation applies in both wetland and/or organic soil cases. WRC activities, which involve deliberate restoration of altered/degraded hydrology are not treated by this methodology (mangrove restoration e.g., would go to VM33). Finally, we should note that this applicability condition has been reviewed, applied, and audited extensively under the CDM and American Carbon Registry.

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		higher water consumption than native species, would that constitute "intentional manipulation of hydrology"? Does that depend on the "intention" with which the project activities were implemented, and how would that be assessed? b. What if the species used for project activities had lower water consumption? Would change in the water table need to be monitored, and how would the effects of project activities be isolated from the effects of climate? 4. With regard to the definition of "historic natural conditions", which is a term open to broad, subjective interpretation, a clear definition needed for both "historic" and "natural". a. What time frame should be considered as "historic"? b. Does "natural" mean in the absence of humans? Does it mean in the absence of colonization and/or establishment of settler states, where applicable? Does "natural" preclude the use of any introduced species? c. What if an introduced species has become "naturalized" and/or where seed exists in soil seed banks or seed dispersal is likely from existing populations in the region?	

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6	Conservation International	There is no mention of no planting of exotic plantations in native ecosystems. Is it possible to expand on the rules of native ecosystems captured in the Standard in this methodology? It is a rule that is interpreted loosely by both proponents and VVBs e.g., only considering forests as native ecosystems or simply arbitrarily classifying an area as "degraded" and then using that as justification that the baseline is not a native ecosystem and then for the exotic plantation ARR activity to go ahead. Also, if ARR is allowed in degraded forests, how will the native ecosystem rule be applied?	Planting of exotic species is not excluded in the methodology, which is solely focused on accounting climate impacts. If ARR happens in a degraded natural forest, the VCS prohibition on clearing native ecosystems (not repeated in the methodology) still applies. Because a natural forest is degraded doesn't mean it ceases to be a natural forest - there is no ambiguity in the VCS rule.
7	Form International	The applicability criteria for this method are few. As such, hypothetical projects that lead to negative consequences for biodiversity and climate could be eligible to claim credits by using the proposed methodology. This could include tree planting on originally non-forest habitats (grasslands, deserts, non-forest land with high albedo) as well as the burning of native trees in favour of tree plantations (with native or non-native species).	These safeguards are provided in the VCS Standard (which governs the methodology).
8	Living Carbon	Section 4, Applicability Conditions, states the following: "This methodology is not applicable under the following conditions: Project activities take place on organic soils or wetlands and result in an intentional manipulation of the water table (i.e., the project activity must not involve manipulation of hydrology or	The methodology does not exclude planting genetically modified trees on non-wetlands and non-organic soils. It's reasonable to expect that many genetically modified trees will have higher water consumption rates (associated with faster growth), and if planted in a wetland environment, would draw down the water table resulting in soil carbon dynamics not captured in the methodology (but potentially

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		otherwise affect hydrology). If species planted are other than those likely to have occurred under historic natural conditions in the project area, per best available knowledge (relevant literature and/or consultation with local experts), it is assumed that the project activity on organic soils or wetlands results in an intentional manipulation of the water table." In particular, the above criterion states that "If species planted are other than those likely to have occurred under historic natural conditions in the project area… it is assumed that the project activity… results in an intentional manipulation of the water table." And therefore, a project would be ineligible for consideration under the ARR protocol. The criterion would seem to exclude trees arising from gene editing. This is at odds with our understanding of the motivation for this new methodology development, which was to enhance the inclusion of a broader range of project types, though in its current form the methodology is exclusive of the types of high-quality carbon projects we're working to develop. Contrary to the methodology passage above, some landscapes that are the product of environmental degradation will not readily support the nutrient and soil condition demands of historically endemic species, which would seem to automatically eliminate many potential afforestation project areas in the Eastern United States. As an example of the potential magnitude of	captured in VM0033).

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		carbon projects affected, there are no less than one-half million acres of former mine land throughout the Eastern US, which are sites of prior fossil fuel extraction, and have yet to be reforested. These tracts still exist as unforested landscapes, despite in some cases as many as 4 decades of "recovery". The substrates of abandoned mine lands commonly consist of compacted; nutrient-poor backfill material, with little to no soil development. This typically will not support historically endemic species, as evinced by the lack of trees after decades of time. However other non-endemic species or species that are engineered to have enhanced root growth and high tolerance to toxic metals can grow in these settings and re-establish canopy cover and amend soil conditions over time. It may be important to include options for trees that are the product of gene editing, which is one of few options for reforesting degraded lands that require robust tree stocks in order to restore canopy cover. We would like to ask the protocol authors for more clarity in the passage above and we strongly argue that engineered tree species present a unique opportunity to quickly restore various barren landscapes where endemic species otherwise would not grow. Such projects have not been and are not financially viable without support from programs such as carbon credit projects.	

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		We have collected extensive remote sensing, in situ, as well as historical information on land-use development and costs directly from landowners of abandoned mine land in the Eastern US. We would be happy to share this information as evidence that such reforestation projects would not proceed without financial support through programs such as the ARR carbon methodology.	
9	Shell	(Pg. 7) Allows for 'indirect activities, e.g., activities that permit or facilitate natural regeneration', however this would only seem applicable to the area-based approach, not the census-based approach (which relies on the existence of 'planting units') however it is not stated here, which raises the question as to whether a 'planting unit', in this circumstance, could be an existing natural regenerated sapling?	Good point. Census-based quantification would absolutely not work with facilitated natural regeneration, because it requires a determination that each planting unit is directly attributable to the project activity. Also, thousands and thousands of naturally regenerated seedlings would not be workable using the census-based approach. This is now clarified in Table 1.
10	Shell	(Pg. 7) Wetland restriction: 'Species that naturally occur' – lots of species naturally occur, but not all dominate as in a planted monoculture. Could this be a loophole to affect the water table? Is it not better to state that projects must demonstrate that water table is unaffected by activity?	This is admittedly an imperfect application, but applicability conditions require a clear determination to be made once ex-ante, and thus cannot be monitored.
11	Ecotierra	(Table 2) How it was explained in the PowerPoint presentation, we understood that under this approach, it will be imperative to tag and defined GPS location for each tree, shrub, etc. In agroforestry grouped project	No. Areas of this scale should use the area-based approach.

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		with a potential area of 4,000 Ha, it will be a very expensive process. In this case, should we tag each project parcel unit instead of each tree? or should we develop the project under the area-based quantification approach?	
12	Shell	Should the performance benchmark still consider the financial characteristics of the project so that only projects with a financial need are deemed additional?	Yes, additionality now requires demonstration of an implementation barrier in addition to the performance benchmark.
13	Shell	(Table 2) Census based. "No pre-existing woody biomass (e.g., trees or shrubs) is removed to provide space for the plantings" is extremely hard to confirm. Additionally, while one might not remove the pre-existing woody biomass, a competitor could be planted next to it to outcompete resources. This potentially allows the census-based method to be used in a situation where the baseline is natural recovery and thus side-stepping performance benchmark as baseline?	Text added to Table 1 applicability condition: "(confirmed via pre-project photos and/or attestation)." It is true that the census-based quantification approach would not account the deleterious effects of competition from the planted units on neighbouring vegetation but given the necessary orientation of this approach to small-scale activities, and requirement that the activity does not result in a change in land use, it is reasonable to expect that those impacts would be small relative to the removals accounted in the planting units.
14	TLLG	The ARR Methodology allows for two quantification approaches: area-based and census-based. The area-based approach is appliable to ARR activities that can be clearly delineated spatially, while the census-based approach requires a complete census of all planting units. The census-based approach is described as being best-suited to dispersed planting activities including agroforestry and is not applicable if there is a change in land	Applicability condition stricken (had been included to exclude leakage).

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		use. To assist agroforestry projects to determine which quantification approach to follow, it could be useful to include guidance on when there is considered to be a change in land use in the context of an agroforestry project. For example: Area-based approach for: • Grassland to Cropland, when an agroforestry system with dispersed planting of trees is established on grassland. • Cropland or Grassland to Forest land, when an agroforestry system results in tree cover sufficient to mean the definition of forest land. Area-based or census-based approach for: • Cropland remaining Cropland or Grassland remaining Grassland, i.e., when trees planted do not result in tree cover sufficient to meet the definition of forest land. • Forest land remaining Forest land, when an agroforestry system is established in forest land e.g. cacao agroforestry.	

Section 6 – Baseline Scenario

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15	Kennemer	(Pg. 11) We note that the ARR Methodology section 6 on Baseline does not include "Conditions under which carbon stock and change in carbon stock may be estimated as zero" such as in section 5. of CDM A/R Tool 14. Those might be relevant and useful for areas of evidently high levels of erosion, frequent slash-and-burn cycles and other conditions. These conditions might not be representatively captured by a random sample of visual interpretation plots of e.g. the iTrees tool as their condition might vary considerably on a small-scale of only a few hundred meters. Thus, a delineation of a "eligible control area" as per Appendix 1 Step 2. We suggest that more conditions of section 5. of CDM A/R Tool 14 are incorporated into Step 1 of Appendix 1.	See Step 1 in the Appendix - this sets out circumstances where a zero performance benchmark may be assumed (under "simplified performance benchmark").
16	TLLG	The potential to set the performance benchmark to zero in project areas where there are no governmental programs or incentives for tree planting, and there has been continuous cropping for at least 10-years, is useful for agroforestry projects. If this could be expanded to include any land where it can be demonstrated that tree biomass has declined over the last 10-years, this would increase the potential for agroforestry projects to simplify their accounting.	A trend doesn't reflect potential, and this should reflect potential. The bar should be high for using the simplified (zero) performance benchmark.

Section 7 – Additionality

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17	Form International	In the area-based approach, the additionality is incorporated through the implementation of the performance benchmark. Apart from regulatory surplus, no other aspects of additionality are considered. Due to the limited amount of explanation in the proposed methodology, it remains unclear how it will be safeguarded that projects are additional, i.e. that they could not have taken place without the establishment of the VCU revenue stream.	We have added demonstration of an implementation barrier to the area-based approach as an added safeguard.
18	Kennemer	We notice that the methodology proposes a changed Additionality Demonstration to VT001 "TOOL FOR THE DEMONSTRATION AND ASSESSMENT OF ADDITIONALITY IN VCS AGRICULTURE, FORESTRY AND OTHER LAND USE (AFOLU) PROJECT ACTIVITIES". Verra needs to clarify how the new proposed ARR methodology and VT001 will relate.	The methodology will not use VT001.
19	Kennemer	The new proposed ARR methodology does not include the optional Step 2 Investment Analysis. This option continuous to be important for ARR projects such as VCS Project ID 2412. Especially in the critical context of Agroforestry the Step 2 analysis will be key. While we see some improvements in the Additionality Requirements of the new proposed ARR meth (Regulatory Surplus, also good point Step 2b 1.a) i. "5% of implementation costs" better than previous "no other income" of VT001), we think that	The current methodology under development will not refer to VT0001.

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		also VT001 holds points stronger than the currently proposed version of the new ARR meth (e.g. VT001 Step 2). We there propose that Verra rather update VT001 and incorporates some of the good points into a generally applicable new version of VT001. Performance Benchmark should not be part of the Additionality demonstration. Additionality demonstrations that are methodology specific should be avoided as they lead to "cherry picking". It would be good for VCS AFOLU credibility if Additionality demonstrations remain unified. Thus new proposed ARR meth should refer to VT001.	
20	Conservation International	Must a project demonstrate only one, or all of them (investments institutional). The barriers analysis is quite subjective and it would be quite easy for a project to create a narrative of one barrier and therefore be additional. Suggestion determining some thresholds.	Only one barrier must be demonstrated. Quantitative thresholds are included for the investment barrier. Note that this demonstration is only necessary where the performance benchmark is not used - we expect the vast majority of ARR activities at scale to use the performance benchmark.
21	Conservation International	Verra should clarify that i and ii are examples only, and that other financial analysis could be performed. It is not clear what is the threshold so the project activity would be consider additional.	The insertion of "e.g." is clear and will be understood by VVBs. The thresholds are clearly stated, threshold for "ii" is implicitly any value more than zero.
22	Conservation International	Please provide more clarity to ensure the reader understands a combination of evidence must be provided.	A combination of evidence is not required.
23	TLLG	The ARR Methodology excludes Investment Analysis as an alternative to Barrier Analysis	Barrier analysis includes an investment barrier, so this option is there for agroforestry activities. Additionally,

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		for demonstrating additionality using the project method for assessing additionality. Investment Analysis could be suitable for some agroforestry activities.	demonstration of an implementation barrier is now required for all projects (even those using a performance benchmark) as an added safeguard.

Section 8 – Quantification of GHG Emission Reductions and Removals

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24	Sylvera	Regarding the census-based quantification uncertainty calculation on p.31 of the draft methodology, could you please explain the rationale behind the 15% deduction (equation 38)?	The 15% precision tolerance follows the VCS Standard (and the rationale is deliberately not repeated here).
25	Sylvera	We welcome the introduction of emission factors for harvested wood products (p.19 of the draft methodology) using data derived from Winjum et al. (1998). Are there any more recent figures or even methods for evaluating the fraction of wood products that will be emitted between within five years of production and between five and 100 years after production?	Not that we are aware of for global application.
26	TLLG	Ex-ante estimates of tree biomass should be derived from tree growth and stand development models, or published data relevant to the project area. There is a scarcity of tree and stand growth models that	this is not the principal use of a methodology, and the guidance is kept minimal and non-prescriptive.

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		apply to agroforestry species, so guidance on conservative ex-ante estimation of changes in tree biomass may help agroforestry projects.	
27	TLLG	Procedures for quantifying uncertainty include the parameter: Up,t Percentage uncertainty (expressed as 95% confidence interval, as a percentage of the mean) in carbon stock estimate of pool p (representing woody biomass, herbaceous biomass, dead wood, harvested wood products, litter, and SOC) in the project scenario in year t (%). This is calculated from sampled field measurements. Guidance on calculating percentage uncertainty from stratified samples/cohorts could help agroforestry projects that use stratified sampling.	It would be unmanageable from a methodological standpoint to lay out variance estimators for a wide range of sample designs, nor necessary as the statistics are established and widely available and are well understood by VVBs. However, it is intended to develop an annex with guidance on MRV in agroforestry settings, which could cover these considerations.
28	TLLG	The methodology states that "Where project activities include harvesting, the maximum number of GHG credits generated by these activities over the crediting period must not exceed the long-term average GHG benefit". Many agroforestry activities are likely to include some harvesting, but this may not follow typical harvesting patterns. Clarification of the types of harvesting that require long-term average accounting, including examples that represent different types of agroforestry, could help agroforestry project developers to identify when long-term average GHG benefit must be used to meet the requirements in this methodology and the	Now specified (even-aged harvesting – clearcuts, shelterwoods and seed tree cuts)

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		VCS Standard.	
29	Conservation International	(Pg. 21) If canopy cover is <5% and woody biomass is removed for site preparation, does the removal still have to be quantified and deducted as project emissions?	No. This is clear in the "pre-existing woody biomass" section. If % canopy cover is <5%, it is assumed that pre-existing woody biomass stocks (prior to site prep, which is part of the project activity) are zero.
30	Conservation International	(Pg. 22) Please provide clarification, the same individual species or group of species planted. could regeneration of different spp as result of the project activities (e.g. fencing) be accounted for? It should if also attested that was result of the project activity (thus the #1 would be invalid)	If a new species is planted "not from the original planting material" (this text important), e.g. live fencing, they would count as new planting units.
31	Conservation International	(Pg. 23) How does the project proponent demonstrate control and right of use of wood products after they have been sold? Most parameters in this section can vary a lot, considering the uncertainties, more rigour should be introduced for proponents to qualify to claim for HWP such as quantifying wood density for species planted and keeping detailed records of all harvested wood products, particularly considering that the source of emissions factors used dates back to 1998.	See reporting and documentation requirements for parameter Vex in the parameter tables. The PP does not have to maintain ownership or chain of custody of HWP (as an accounted stock they attribute to the area where they were produced/sourced, following VCS methodology precedent). It's a good question re uncertainty around the estimation of longterm residency of C in HWP. We are aware of no other potentially globally applicable studies to reference. The only other alternative would be to exclude HWP from the accounting boundary and assume all extracted volumes are immediately emitted.
32	Stafford Capital Partners	Step 1: There is currently only a very high-level description in the methodology on how to calculate this first step, however we consider this step to be the most impactful in the whole calculation. In practice we would use	See detailed guidance in parameter table for the Vex,ty parameter. This is dependent on direct project area volume estimates. It's not the wood products that could be extracted, it is the wood products that have been extracted. > "Volume of commercial timber extracted is sourced from scaled volumes verified from mill or hauling receipts dated

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		one of the existing software packages (usually country specific) to determine the wood products that can be extracted from a forest in a thinning or clear fell (however this is not a requirement from your methodology, and there is neither an indication on how this should be calculated in a way that VCS will accept) for example, by using this software in Brazil: https://www.embrapa.br/busca-de-solucoes-tecnologicas/-/produto-servico/1485/sis-pinus---simulador-de-crescimento-e-producao-de-pinus (STAKEHOLDER INCLUDED A FIGURE IN THE PDF DOCUMENT) Still, this only gives at the thinning or clearfell the volumes by diameter class, and another calculation would be needed to convert this output into the proportion that goes into the five different wood products classes that you request for Step 1. As a general convention in the forest sector we could say that over 8 cm diameter is sawlogs and under 8 cm is pulpwood. However, there are no rules or guidance for the conversion from these two classes into the five wood product classes that you suggest. At the country level, there is FAO data with which we could infer the ratio of wood that goes into each category, or at the individual plantation project we could derive a more specific split given the current industry located nearby, but there is no indication in the methodology on what would be the best standardized way to do this product split.	to the monitoring interval ending in year t, accompanied by records that identify the source area of the received wood" For parameter table Vex,ty, we have added the following "Assigned product class ty must be supported with evidence sourced from the receiving wood processing facility (e.g. mill specifications, written attestation)."

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33	Stafford Capital Partners	About the 5 wood product classes You have based the methodology on the Winjum et al publication from 1998 (in turn based in FAO data from 1995), but nowadays 26 years later, FAO has considerably more data, with a complete hierarchy of wood products, that allows a clearer understanding of end uses. This graph below is the wood flow with data from FAO database (2020): (STAKEHOLDER INCLUDED A GRAPH IN THE PDF DOCUMENT) When it comes to comparing with your division, the first problem would be with plywood, which represents an important share of the industrial wood globally (187m m3 output, thus about 375 m m3 input), and its consideration as a wood-based panel. The raw material for plywood is from the same log product as you would cut sawnwood (sawlogs) whilst the raw material for the rest of wood panels is either from pulpwood or from the byproducts of the sawmilling processes (woodchips). From the perspective of its use as a wood product, it is also different as plywood goes mostly into structural uses, more similar to sawnwood. Therefore, in our opinion plywood should be grouped with sawnwood and not with wood panels. When we think about the sawlog conversion into wood products, we can assume that half of the log volume will go into sawnwood and	Agree that FAOSTAT data (which we are familiar with) now provide better resolution of end wood products, however, a study comparable to that of Winjum et al has not been produced since, and we have no way of knowing what retirement/oxidation rates are across the broader spectrum of "new" wood products. The wood waste fraction of a sawnlog is emitted immediately, and cannot enter accounting as another "type" like pulp. This is admittedly simplistic, intentionally (to align estimation effort to the significance of the long-term storage in harvested wood product pool). Accounting is driven solely on the basis of log volumes delivered to a processing facility, not later by volumes diverted among different product streams within a facility (which could produce double counting).

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		the other half into wood panels or pulp. However we understand that in this methodology all of the sawlog volume should go into the sawnwood category, because for all wood products there is already either 19% or 24% going to wood waste, and so we would be double counting of that volume? Currently it is not clear to us how this should be accounted correctly. Lastly on this point, we would question the relevance of the "other industrial wood" category, when it represents less than 10% of the total industrial wood flow globally according to FAO 2020 data.	
34	Stafford Capital Partners	(Pg. 36) Perhaps this is less relevant, but the carbon fraction of the biomass (page 36) assigns a value 0.47 for all species, however IPCC Chapter 3: LUCF Sector good practice, Table 4.3, presents a more detailed subdivision which we consider more accurate: (STAKEHOLDER INCLUDED TABLE 4.3 IN THE PDF DOCUMENT)	Do you suggest breaking it down by tree component?
35	Stafford Capital Partners	Step 3 In the methodology wood waste seems to be referred to in a very simplified and generalist way, at either 19% or 24%, when the referenced article (Winjum, J. et al 1998) states: "However, the amount of wood waste accounted for 20% of the industrial roundwood consumed varied widely among the industrial countries considered here,	The methodology deliberately avoids use of the annual decay functions for simplicity (to avoid the need to maintain an annual ledger of harvested wood products inputs and outputs, and allow accounting at the time of harvest). Agree on comments re wood waste and relevance of destination of end products. Vex,ty parameter now specified as "over bark." The Winjum et al 1998 paper is admittedly out of date. There are no recent comparable global estimates to drive a universal approach for accounting harvested wood

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		from 11% to 56% for the four developing countries and from 25% to 51% for the four developed ones". Furthermore, in the recent publication from FAO (https://www.fao.org/documents/card/en/c/ca7952en/) we can see that the distinction made between developed and developing countries, that perhaps made sense in 1998, no longer applies considering up to date data, as an example the following graphs: (STAKEHOLDER INCLUDED TWO FIGURES IN THE PDF DOCUMENT) These charts show for coniferous sawmilling that Chile and Ukraine (developing countries?) have higher sawnwood recovery (and hence lower waste or by-products) than Canada or Sweden (developed countries). The same is observable for non-coniferous sawnwood production (Nigeria versus Denmark for example). Otherwise, we think that wood waste cannot be simplified to a single factor regardless of the wood processing industry. For example, in the sawnwood industry, the "wood waste" of the sawmilling, is just the raw material for other wood processing industries in the form of chips or sawdust, and the wood flows and conversion factors are very well documented in that same FAO publication: (STAKEHOLDER INCLUDED TWO FIGURES IN THE PDF DOCUMENT)	products.

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		Another issue we would like to raise is with the table of the OF parameter (page 44 of the methodology document based on Table 2 of Winjum et al. 1998). We agree on the different degradation that wood products suffer in different climates, however this should not be based on the country where the wood is harvested but rather where the wood product is going to be used. For example, Uruguay (tropical country) produces pulp, but 99% of this is exported to boreal and temperate countries, or New Zealand is another example of a country, very relevant in global timber production, which exports most as roundwood to other destinations. We feel there is sufficient FAO data on wood products trade to infer the proportion of wood products that will be used in different destinations (boreal, temperate, tropical) from that where the wood was harvested. Another issue with the table of the OF parameter, is to see that sawnwood and paper have the same numbers (both being 0.38 and 0.62 in boreal and temperate respectively), which we are surprised at considering they are such different wood products with different end uses, mainly with the fact that a big share of sawnwood goes into structural use that lasts many decades on average; thus we suggest to review more than one, preferably updated (than 1998) data source to derive where currently the wood goes into which uses. Regarding the annual oxidation factor, which	

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		has been brought from 95 years to the present. This doesn't recognize that the average oxidation is in year 50, but it brings it to the present. We suggest it would be more accurate to follow an annual oxidation fraction, and then considered the remaining oxidation in the last year of the crediting period? This would give a more accurate recognition of the carbon storage role of the wood products during the 95 years period. Another question where we would need clarity, is that in the Winjum et al. 1998 article, in the section on conversion factors, it adds the bark volume (0.12 in average), and whilst the VCS methodology is based on that, it is not clear if volumes should be over-bark or under-bark. I believe the wood waste figures then will make more sense if it is over-bark? But we would need a clarification on this. Finally, it would be very useful to have an example of the calculation for the Harvested Wood Products, similar to what you have in the leakage tool document for example, thus it might be easier for us to follow a real example. We have simulated the calculations in some of our forest carbon models in different geographies and species, but we are not sure if we are doing the calculations correctly. We can share them with you in case you have availability to review them, or otherwise perhaps we could have a call to demonstrate our calculations and go through	

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		the issues/questions raised here.	
36	Conservation International	(Pg. 27) What about litter in the context of harvesting? After the final harvesting most litter will be a potential source of emissions. Should this pool be considered for projects with harvesting? If litter is removed or lost through activity other than anthropogenic, can litter still be claimed?	In almost all cases litter will be de minimis. If litter were excluded from the accounting boundary, and the ARR activity involves harvesting which results in a loss of forest litter, the project would be failing to report a net zero result (because the litter pool is an addition from the ARR activity).
37	Sylvera	(Pg. 23) Regarding soil organic carbon (SOC) data, there seems to be uncertainty around SOC gains and losses during harvests, which also depends on the type of afforestation project being implemented (e.g. land class etc.)4. The SOC measurement method seems to be more reliable than the default factor-based method. Why is it not listed as the preferred method for SOC measurements?	The default factor-based method to estimate SOC was deleted.
38	Shell	(Pg. 23) Interesting that it cannot be accounted for with census method. Two options given to measure for area-based method (one capped at 0.8TC/ha/yr, as per CDM). Presumably a project could use both and choose which one gave the most? Do projects have to choose one at the outset, or could they change options through a deviation during the crediting period?	Clarifying text added to 8.2.7 - "One method must be selected at the project start and held constant through the project crediting period." SOC can't be accounted using the census-based approach because any SOC measured or estimated cannot be attributed solely to the planting units (and there would be no clear means to estimate an attributable fraction).
39	Conservation International	(Pg. 28) Is there clear evidence that planting trees in unwooded areas always leads to increases in SOC, especially in cases where the baseline and shrub stratum are lost in	The default factor based method to estimate SOC is removed from the methodology. Therefore, only direct SOC sampling will be accepted

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		the with-project scenario. There is conflicting evidence in the literature. Consider excluding the default factor based method.	
40	Conservation International	(Pg. 28) Provide clear definitions of the land use states described above using terms such as non-native grassland instead of grassland as ARR on native grassland is not allowed.	Text unnecessary and stricken.
41	Form International	(Pg. 41) The 15% deduction that is applied at the end of the equation warrants some explanation and justification, which is currently not present in the proposed methodology.	This follows the VCS Standard and that guidance is not repeated in the methodology.
42	Yale Carbon Containment Lab	(Pg. 42) (1) Tree Planting 1a. Commercial Species on Non-Commercial Lands: The Methodology states that, "Where a commercial tree species is planted as part of the project activity, or the project proponent is a forest management entity, it is conservatively assumed that the project area will be subject to harvest" (Section 8.5, "Net GHG Emission Reductions and Removals"). *Recommendation*: An exemption should be specified for projects that plant species with commercial value (e.g. Ponderosa pine, Douglas fir) but that are being planted on verifiably non-commercial lands (such as tribal or public conservation land), where there is no intent to harvest or there are clear harvest restrictions. 1b. Species Mix and Planting Patterns: Currently, the Methodology is silent on the topic of tree species selection and planting	Yes, good point. Text now added: "unless the project area is subject to legally-binding constraints precluding even-aged management (e.g. a conservation easement prohibiting the use of clearcuts), or an explicit attestation documented in the Project Description warranting that even-aged management will not occur, supported by e.g. a notarial deed, or a clause in a permit or similar." The methodology is intentionally agnostic on species mix and planting pattern - all of the approaches mentioned are allowed (implicit in the applicability conditions).

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		patterns, which is a missed opportunity to advance climate resiliency. *Recommendation:* The Methodology should explicitly permit changing the project area's tree species mix to boost the replanted forest's resilience to climate and other stressors, so long as species are native to the broader region and not planted as monocultures.2 Likewise, the Methodology should include provisions to allow for (or even reward) lower-density planting approaches in non-commercial forests (where relevant) that mimic natural post-wildfire re-seeding and encourage healthier forest regeneration, such as tree island or spatially heterogeneous reforestation.3 In drier and more fire-prone ecosystems, lower density approaches have been shown to result in higher carbon storage per tree and overall in the forested area.4	
43	Conservation International	(Pg. 43) Does this mean *AFOLU Guidance: Example for Calculating the Long-Term Average Carbon Stock for ARR Projects with Harvesting* is no longer applicable?	The long-term average should still be used and applied by project proponents.

Section 9 – Monitoring

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44	South Pole	(Pg. 34) Document states "Rj : The source of data must be chosen from the following sources, listed in descending order of reference: 1) Detailed data collected using common practices for root sampling in the area 2) Published study specific to project region and vegetation community 3) Global forest type-specific or eco-region-specific value (e.g., from the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry5)" In the previous methodology was suggested to use the Rj calculated with an equation based on the biomass. Is this not required now? RSR equation: R=e^(-1,085+0,9256*lnB)/B From: CDM_AR_tool_14. "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities".page 25	The RSR equation is not used.
45	South Pole	(Pg. 55) Document states "Plot-based sampling approaches (using area-based quantification) may be augmented using double or two-phase sampling approaches combining limited direct plot-based field measurements with wall-to-wall remote sensing metrics to eliminate sample error (and replace with model error). Any remote sensing metrics employed must have	Double sampling will be understood by VVBs and biometricians using the methodology. It is a well-established sampling approach using two sources of data (hence double), e.g. one source being field measurement plots (sample-based, w incomplete coverage) and the other source being aerial imagery (w complete coverage).

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		demonstrated correlations with biomass (e.g., the Normalized Degradation Fraction Index31 from Landsat imagery, or average canopy height derived from Lidar). The remote sensing metric applied must satisfy the following" We do not understand the "maybe augmented using double or two phase sampling approaches". What do they mean with double? Do we need to increase the sampling plots to double, and for what reason?	
46	South Pole	(Pg. 57) Document states "Area-based quantification: Volume of commercial timber extracted is sourced from scaled volumes verified from mill or hauling receipts dated to the monitoring interval ending in year t, accompanied by records that identify the source area of the received wood. Census-based quantification Volume of commercial timber extracted is calculated from field measurements of sampled planting units (described further in Section 8.2.2) conducted prior to harvest, as:" For the "area based quantification" some projects that are not implemented yet and have not done harvesting will not have volumes verified from mill receipts. In this case and to calculate the ex-ante for the PDD and the validation, a model or a percentage of expected timber wood could be used as an estimate of the expected timber	The methodology is not overly prescriptive on ex ante estimates. See Section 8.2.10 "8.2.10 Guidance on ex-ante estimation of project net GHG removals." Importantly, the methodology states "carbon stocks of other pools than trees may be estimated as zero." So harvested wood products could be conservatively assumed to be zero ex ante.

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		wood. Is this possible? Would it be possible to use secondary information from scientific articles?	
47	South Pole	(Pg. 68) Document states "Data / Parameter: $BLDW,t$ t dry matter ha-1 Data unit: Description: Biomass of lying dead wood in year t" Biomass of deadwood in the previous methodology could be included by using IPCC values. Is this still the case? Or just direct measurements can be applied?	Only direct measurement.
48	Sylvera	(Pg. 35) In the proposed methodology, the IPCC data referred to on p.35 regarding the aboveground biomass and root to shoot ratios is from 2006. In 2019, the 2006 figures were updated. They can be found on p.18 of Chapter 4: Forest Land of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories2. ○ Is there a reason why 2006 values are used in the methodology and not the latest ones, which are more specific? Sylvera recommends integrating the latest and more specific 2019 values, shown in the tables in the Appendix in the new VCS methodology.	Updated to IPCC 2019 values.
49	Sylvera	(Pg. 37) Whenever there is a choice to select data inputs, such as root to shoot ratios,	This is implied and will be checked by the VVB (to confirm the process in the methodology was applied).

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		wood density, or biomass expansion factors, it is stated that "Data must be chosen from the following sources, listed in descending order of preference:" (p.37 of the draft ARR methodology), and default IPCC values come last. If a project developer chooses default IPCC values, they should state why no other regional or national values exist to justify their data selection choice.	
50	TLLG	Plot-based sampling - The methodology acknowledges "the wide range of valid approaches [for plot-based sampling], and that relative efficiency and robustness are circumstance-specific". So sampling, measurement, and estimation procedures are not specified in the methodology Optimal approaches for plot-based sampling for some agroforestry systems, e.g., alley cropping, may be different from typical methods commonly applied in A/R projects. Agroforestry projects may therefore benefit from some guidance on appropriate plot-based sampling approaches for different agroforestry systems.	Again, providing detailed guidance on sample designs and field measurement protocols is beyond the scope of an accounting methodology. However, it is intended to develop an annex with guidance on MRV in agroforestry settings, which could cover these considerations.
51	Conservation International	(Pg. 68) Many of these tables describing how parameters should be measured or calculated are open-ended. The "open-endedness" of this methodology is both a strength and a weakness: The pro is that it allows for flexibility and the use of more advanced techniques at the cutting edge of	These tables are not meant to be a user manual, nor serve as standard operating procedures. Projects will have to develop these kind of detailed step by steps, as well as sample designs, to guide the collection of field data and ensure that the "bare" requirements in the parameter tables and methodology are met. As you recognize, the tables are deliberately non-prescriptive to allow flexibility

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		forest measurement and a wide range of data and collection methods tuned to the specific circumstances of each project. The con is that it may result in wildly inconsistent accounting methods *between projects* and potentially between project accounting and monitoring periods for a single project unless such practices are specifically prohibited. Since accusations and evidence of subjective baselines and inconsistent accounting have been cause for recent critiques of carbon offsetting projects (though they were aimed at REDD projects most recently) and because such concerns have been shown to be warranted in some cases, this methodology needs to critically evaluate how it can maintain flexibility while also retaining scientific rigor and producing consistent carbon accounting *between projects*. Sources are cited for applying "best practices", but maybe specific guidance should be included on minimum sample size (i.e., number of plots) and connected with uncertainty calculations.	and innovation for PPs seeking to improve cost efficiencies, while providing enough requirements to ensure minimization of bias (sample design, QA/QC procedures) and permit proper estimation and accounting of sample error (sample design), namely via these overarching provisions: 1. Be demonstrated to be un-biased and derived from representative sampling. 2. Accuracy of measurements and procedures is ensured through employment of quality assurance/quality control (QA/QC) procedures (to be determined by the project proponent and outlined in standard operating procedures governing field data collection).
52	South Pole	How is it defined "an appropriate representative sample" for accounting mortality in the census-based approach?	The same as for monitoring, specified as "… a stratified systematic sample, within each annual cohort, selecting planting units systematically with a random start from the list of unique censused planting units."
53	Conservation International	(Pg. 66) Please provide additional guidance as to how this would work.	It's not clear what you're referring to.
54	Conservation International	(Pg. 66) Aerial photogrammetry can meet requirements to get canopy height in areas	This is allowed under the double sampling approach outlined in the parameter table, provided it meets the

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		with scattered trees. Suggest including as a possibility where the correlation can be proved.	specified requirements.
55	Conservation International	(Pg. 67) Does this exclude the use of stand based and other generic allometric equations? In some natural forests with diverse growth forms stand based equations sometimes provide more accurate answers. Can this not be left to the proponent to provide evidence of applicability?	Stand-based yield projections are not allowed. I assume you mean regional or forest type-specific equations like Chave et al. This is a good point, especially in cases where the ARR activity is facilitated natural regeneration and results in a high diversity of tree and shrub species. Have added this allowance for forest type-specific equations.
61	Conservation International	(Pg. 86) The VCS Standard has recently been revised to use the equivalent volume approach which is more appropriate in situations where soil compaction is changed. Suggest the guidelines are revised in line with Standard.	It's equivalent soil *mass* that's required to avoid confounding results of soil compaction. We now reference the Wendt Hauser 2013 ESM approach in the parameter table for soil remeasurement.

Appendix 1 – Performance Method

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62	Earthshot Labs	(Pg. 75) In retrospect this explanation makes sense and the recorded webinar was helpful in confirming my mathematical understanding of equation A2, although initially the presentation of this equation seemed somewhat confusing. It may be helpful to rephrase this quote or add some	Text added preceding equation to better explain. Approach to performance benchmark has been revised substantially.

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		text, either here or when equation A2 is presented, explaining the meaning of the coefficients. Maybe starting with something like this: "Equation A2 shows how to calculate the performance benchmark as the ratio of average change in EVS over the virtual control plots to the change in EVS in the project area". Then it may be helpful to rearrange equation A2 to make this intent clearer. The way I'm understanding it, the first coefficient (*t*) is conceptually linked to the last coefficient (inverse of change in EVS in the project area), and when multiplied together they give the inverse of the rate of change of EVS in the project area. Similarly the middle three coefficients represent the rate of change of EVS averaged over the control plots. It would also be helpful to have some verbal confirmation that the rate of change calculation has two different starting points in time, e.g. 5 years before project start for the control plots and project start for the project area, and a comment on why this is.	
63	Form International	(Pg. 75) For the calculation of the Performance Benchmark, virtual plots in a control area outside of the project area are used. This control area must strictly resemble the project area and must be large, as it must encompass 250+ +/- 1 ha circular plots.	250 ha is not large, and we expect few situations where sample size will be an issue. These are virtual control plots drawn from large regional landscapes. Further, many of the matching criteria are not exact, and thus implicitly provide flexibility in sourcing controls.

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		For project areas that are atypical for the national context (for example degraded forest that is surrounded by a lot of pristine forest) it may pose a serious challenge to identify a control area. No alternative to the use of a control area is mentioned in the proposed methodology. As such, carbon projects might be excluded from using the proposed methodology.	
64	Form International	(Pg. 75) Moreover, the proposed methodology mentions that if land tenure changes or if the control area becomes subject to government-funded tree planting, control plots are no longer valid. However, no mention is made of a situation in which private-funded afforestation or reforestation in the control area starts taking place. This will positively influence the EVS in the control area over time, thereby negatively impacting the amount of credits that can be claimed by the project. The motivation for this choice is currently not elaborated on in the proposed methodology.	If there is private non C-funded reforestation taking place, that is part of the business as usual by definition and should be included in the baseline (and reduce project crediting).
65	Ecotierra	(Pg. 76) Should we know the sub-steps (in detail) to delineate the eligible control area?	Steps to define the eligible control area are laid out in detail in the Appendix (Step 2), and guidance has been expanded in the revised appendix.
66	Ecotierra	(Pg. 76) The PowerPoint presentation is clear about the number of control plots and their size, however; the size of the eligible control area is not specified. What will it be the size of the eligible control area?	There is no minimum required area for the control, only a minimum sample size.

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67	Ecotierra	(Pg. 76) For grouped projects, where the eligible area for the project is large, is the control area determined by each instance or by the eligible area?	This guidance is now clear in the appendix - for grouped projects, each annual cohort will have controls assigned to it.
68	TNC	(Pg. 78) we do have concerns with some of the technical guidance around estimating baselines, including: Step 3.1 from Appendix A states that the percent cover approach to estimated vegetative stocking (EVS) is poorly suited to herbaceous cover. This is a valid point, but the methodology does not seem to provide explicit safeguards against poor quality EVS estimates including 1) overestimating baseline scenario if there is significant herbaceous cover in satellite imagery on virtual control plots, or 2) overestimating with-project scenario if there is significant herbaceous cover on the with-project area. This should be explicitly incorporated given the scant amount of biomass often stored in herbaceous material and the frequent presence of herbaceous plants in newly regenerating areas of forest and agricultural fields.	We have removed the percent cover approach, in part for the concern raised.
69	TNC	(Pg. 78) Finally, there does not seem to be a set minimum for the number of virtual control plots. Initially, 250 plots are selected but then some of these may be removed if they are forested or unstocked. This makes sense, but, given the likely variability in the data derived from optical imagery, there should ideally be a large number of plots to prevent any outlier points from having inordinate	The methodology now has a minimum sample size specified and uses a more "traditional" paired matching approach, with weights applied to control plots (higher weight to better matches).

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		leverage. We suggest a set minimum sample size for virtual control plots, likely higher than you would use for actual on-the-ground plots (100 seems a logical number), and that if sample size dips below that, the methodology requires repeating previous steps to select additional samples from the same region from which the original 250 plots were selected.	
70	Fundación Repsol and Sylvestris	(Pg. 78) In general terms, we think that the demonstration of additionality in projects should not prevent them from being carried out due to their complexity or cost. It seems that this methodology is designed for big projects, but smaller projects should also be considered, and we propose to differentiate some requirements regarding the size of the project as we specifically mention below. Step 4: Select and monitor control plots from the eligible control area: ○ We think that the number of control plots is too high (250 or more) and does not consider the size of the project. As an example, we would need more information on how to proceed in the case of small, burned areas (e.g. <200ha). In this case, we would leave too much area outside the project (250 plots of 1ha each) so it would not make much sense. ○ Moreover, in these small projects, control plot size is significant: 1ha is too big and could be resize according	These are *virtual* control plots that do not need to be owned, managed or visited by the project proponent. The required sample size is not excessive compared to other methodologies and is needed to provide adequate precision in reporting.

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		to the project area. ○ We propose to simplify requirements for control plots based on the surface area of the project.	
71	TNC	(Pg. 79) On a related note, Appendix A, Step 4 includes "Any plots determined to be in a forest use and temporarily un-stocked at t=−5 (e.g., recently cut plantation), confirmed via direct visual inspection of Google Earth…". This description is subjective and does not seem to fully safeguard against potential gaming. It would be useful to know whether the authors explored ways to backstop these intuitive methods with some sort of documentation, metric, or objective standard, as this seems to be a better approach than trusting solely on develop experience and/or auditor diligence.	This step has been removed. The matching approach now includes a historic assessment of EVS (without any subjective evaluations of plots).
72	Earthshot Labs	(Pg. 79) If a remote sensing metric is used to pick virtual control plots, as opposed to the percentage cover method, should the +/- 10% requirement be considered a relative percentage range as opposed to absolute range like in the example given for percentage cover? In other words, if the project area has an estimated 50 Mg/ha above ground live biomass from remote sensing, would the +/- 10% acceptable range for a control plot be 45-55 Mg/ha?	This requirement has been removed, and replaced with initial EVS as a matching covariate. Control plots are weighted in proportion to their similarity in initial EVS to the project area.
73	Earthshot Labs	(Pg. 80) Should the capital T here be lowercase? It seems like this should correspond to "t: Time elapsed since project	t is lowercase.

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		start date (y)"	
74	Fundación Repsol and Sylvestris	Step 5: Derive performance benchmark ○ Table 6 (page 81), It is not clear to us how to make the eligibility of the control plots (t=-5): In page 77 the table says that As the Initial land use/land cover: Non forest/forest classification must be based on remote sensing observations within ±1 year of time $t = -5$, we see a problem with areas burnt within the 5 previous years of the start of the project. ○ As an example, if we are planning to start a project in an area that was burnt 3 years ago, and we select the control plots in this area, any of them will be eligible because 5 years ago, the Initial EVS (Percentage Canopy Cover) would be at 100% and the project area in t=0 would be at 0%. ○ We propose some flexibility in time when an event like this occurs, starting the measurement of control plots in the time of the event.	Control plots cannot be within the project area.
75	Conservation International	(Pg. 92) Please provide additional information how "political jurisdiction" should be applied.	Language has been clarified and expanded, and now aligns roughly with JNR guidance.
76	Conservation International	(Pg. 93) Why a 25% forest definition threshold? Are there no minimum area or	These criteria have been removed. There is now no forest

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		height requirements (e.g., for reforestation vs. revegetation)? Are country-specific forest definitions not considered?	definition threshold.
77	Conservation International	(Pg. 93) Although more precise classification would assist in finding similar areas (e.g. same level of enforcement, budget/resources…), independent analysis could create a totally new set of control points and find different results (e.g. argue that it is not additional). The control points need to be used with a lot of attention.	The process for matching, and selection of similarity criteria, is deliberately prescriptive and standardized to avoid potential for gaming. The process is quantitative, objective and replicable.
78	Conservation International	(Pg. 93) What is the process to resolve different results from method 1 and 2?	There is now only 1 approach, using a remote sensing metric.
79	Conservation International	(Pg. 94) Is "project boundary" the same as "project area"? What is the definition of "project region"? Are there similarity requirements as were applied for control plot selection? Could direct measurements of aboveground biomass come from the project biomass plots within the project area?	Following VCS convention, "project boundary" refers to accounting boundary (which pools/sources are included), and "project area" refers to the project geographic boundary. "Project region" is not used. Similarly requirements governing the selection of control plots are laid out in detail.
80	Conservation International	(Pg. 95) Please consider the following scenario and provide clarification, if the control plots result in a greater EVS than project area, is it not going to be additional? In case of projects looking for removals credits from activities that permit or facilitate natural regeneration <Section 4> that use forest guards and patrols to prevent re-conversion of reforested areas and these areas are within control plots, the EVS in control plots may be higher than project. How	If average change in EVS in the control plots exceeds that in the project area, there are not net positive impacts to report and zero credits are accounted. Registered project areas are excluded from selection of control plots.

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		will this type of project demonstrate additionality?	
81	Conservation International	(Pg. 96) Please clarify - 50 points to estimate the EV and 250 as control plots? Why that many - compared with the 50 points	This approach removed and sample size requirements made explicit for the remote sensing metric approach.
82	Conservation International	(Pg. 96) Another equation should be added here to explicitly illustrate how the change in EVS is calculated on a plot-by-plot basis	See equation A1.
83	Conservation International	(Pg. 74) A step may be missing, since there is no explanation or equation as to how to calculate the "increase in average estimated vegetative stocking (EVS) in the project area, in the interval from t = 0 to T". Perhaps it should be step 4c, to "Re-evaluate EVS and calculate cumulative increase in EVS for project area plots". The methodology as currently written only includes the step for calculating dEVS_control and does not include a step for calculating this value: dEVS_WP. In addition, the subscripts here could be incorrect. There should be no I subscript on the change in average EVS in the project area, since i is used to denote the number of the control plot.	Good point. Equation has been expanded to include derivation of average EVS for project area.
84	Conservation International	(Pg. 97) Should a new term "j" be defined to denote each project area plot?	See revised equation.
85	Conservation International	(pg. 97) *Calculation of EVS and dEVS in the project area* - Though there is an explanation for how the estimated vegetative stock (EVS) is	EVS is the project area is estimated the same way as for the control plots. Direct measurement plot data from the project area are not used for the performance benchmark (and measurable biomass is not typically available on ARR

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		calculated for the "virtual control plots", it is not entirely clear how EVS is calculated for the project area. This is essential, because this value is used to derive the performance benchmark (PB) in Appendix 1, Step 5, Equation A2. I would assume that the same method chosen for quantifying EVS in Step 3 (e.g., percentage cover, LIDAR-derived canopy height, NDFI) would be applied to the control plots and the project area plots in order for a meaningful comparison of EVS to be made when calculating the PB. - *Was the intention of the authors that the same biomass plots established to measure woody biomass in the project area (Section 9.2) be used as the "virtual" project area plots for calculating EVSWP? Therefore, the change in EVS for each plot j (ΔEVSWP,j) plots would averaged to calculate ΔEVSWP?* This needs to be clarified in the methodology text. This commentator suggests such an approach because it would (a) allow for comparable data between the project area and control plots when evaluating EVS, and (b) allow for the calculated EVS to later be compared to *actual measured changes* in biomass in the project area once such data have been collected, allowing for an accuracy assessment of the chosen EVS quantification method and a means of quality control. At the risk of being redundant, another equation should be added here to explicitly illustrate how the change in EVS is calculated on a	projects until years 5-10). Assessment of EVS in the project area is an independent process. Remember that EVS is not an estimate of biomass used for accounting, and this is deliberate (because the technology is not yet there), it's use is constrained to assessing *ratios* of stock change in control plots *relative* to the project area (from which a simple percent discount is derived). The text has been clarified that the EVS approach must be kept constant through the crediting period (to ensure consistency and eliminate opportunities for gaming), and the same approach must be used for both control plots and the project area. Guidance on the EVS parameter has been expanded to address some of the comments.

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		plot-by-plot basis - Also unclear from the current text: *Once established at validation, does the methodology allow project developers to change the EVS quantification method during subsequent evaluations performed every 5 years? Should changes in the method be allowed or possibly required if a different method can be shown to provide a higher accuracy and/or more conservative estimate with regard to the calculation of net GHG benefits?* - Finally: *Why is **Δ**EVS data averaged across plots? What is the justification for choosing an average over a median or another summary statistic depending on the distribution of **Δ**EVS values? Should multiple statistics be calculated and the one that results in the most conservative GHG benefit be chosen?* *Data comparability requirements* There should be requirements to ensure that comparisons between project and control plots and between years are meaningful, i.e., that data are comparable and that data can be reasonable aggregated when calculating annual average change in EVS. - Imagery source and resolution: For remote-sensing metrics, multispectral data should be from the same source (i.e., the same satellite or satellite array, unless harmonization is	

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		used, in which case a detailed method should be provided). A minimum acceptable spatial resolution should be established. - Consider phenology and seasonality: The methodology currently suggests that the most recent imagery be used. However, if the project area and surroundings have strong climatic or seasonality (e.g., pronounced wet and dry seasons, pronounced hot and cold seasons that affect vegetation growth) and/or phenologic considerations such as deciduous trees and shrubs and/or seasonal vegetation senescence, the dates of imagery used for quantifying EVS should always be from the same month or season, and climate data (e.g., from public third-party sources or local weather stations, when available) should be used to evaluate. Otherwise, data between years and between plots will not provide meaningful comparison. Where Step 4 requires the "most recent imagery" to be used, it would be better to require the "most recent appropriate imagery accounting for seasonality and phenology" to ensure EVS is measured in a consistent way and that data between plots are comparable. *PERFORMANCE AND ACCURACY OF EVS AND ΔEVS QUANTIFICATION METHODS* *Given the diversity of methods allowed for quantifying EVS, how does the methodology expect to achieve consistency between*	

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		projects in terms of quantification of net GHG benefits? Though the methodology does not require specific methods for quantifying EVS, it describes three potential types of measurements that could be used: area-based measurements (e.g., percent cover), canopy height measurements (e.g., LIDAR, radar), and spectral-based measurements (e.g., NDFI). Since EVS is being used as a proxy for vegetative stocking (i.e., biomass and, by extension, carbon), it is important that EVS have a statistically significant correlation to biomass and carbon, as should be required by the methodology. However, another important consideration is that each of the three measurement types have distinct relationships to biomass, and that these relationships can also vary by species. Though not an exhaustive list, each of these three measurement types mentioned have distinct pros and cons and introduce different biases that would lead to overestimation or underestimation of biomass change under different circumstances. Some examples are: - Percent-cover measurements – Do not capture additional changes to vegetative stock once a stand reaches canopy closure, even though additional biomass growth in overstory trees and understory species will continue to occur.	

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		- Height-based measurements – Relationship between tree height and biomass/carbon varies by species, but species composition data will likely not be available for control plots where field data is not collected. This method also ignores above-ground biomass pools and sinks in the understory unless accounted for in another way, such as a ratio factor from literature and/or field measurements. - Spectral methods (optical spectra) (e.g., NDFI) - Methods based in optical imagery are likely to become saturated with respect to a pixel's "greenness" and therefore the estimated fraction of photosynthetic vegetation. These are also affected by short-term climatic fluctuations, phenology, and seasonal changes, which must be accounted for. Furthermore, since understory vegetation is not captured using this method in closed-canopy conditions, there is potentially an underestimate in biomass increase in the understory. Alternatively, increases in photosynthetic vegetation fraction as measured by NDFI could include growth of herbaceous vegetation which have short-term and low levels of above-ground biomass when compared to shrub and tree biomass, thus introducing bias in measurement of biomass change. Souza et al. (2005) highlights the usefulness of the NDFI metric for disturbance including degradation (i.e., biomass/carbon loss), but does not evaluate the accuracy of NDFI in	

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		estimating positive change in vegetative stocking (i.e., biomass/carbon gains), which is the measurement that the methodology aims to capture. Given the differences in biases between types of measurements and differences in their performance across forest types and no requirement to test their performance, the openness of the methodology leaves room for project developers to potentially manipulate GHG benefit calculations by choosing the EVS quantification method that produces the highest GHG benefits. *Suggestions for improvement* We recognize that there are trade-offs associated with each method and that in many cases it will not be possible to visit the control sites, which makes a "virtual" plots a necessity. There will also be limitations: differences in data availability and quality and biases in the dates for which data is available due to factors such as cloud cover or uncertainty in dates/seasons of imagery. Therefore, these comments are aimed at addressing these biases and limitations based on the best available scientific evidence. Therefore, an important question is: *What additional quality controls and safeguards could be added to ensure that EVS*	

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		accurately reflects not only changes in cover but also changes in "vegetation stock" (i.e., biomass and carbon)? Some suggestions are provided here: 1. In order the provide rigorous quality controls when using remote-sensing methods, the requirements laid out for remote-sensing estimates of $CWPwoody_{AB,t}$ in Section 9.2 could also be applied for the performance benchmark process: - Significant correlation with aboveground biomass pools included in the project boundary, previously substantiated with published studies - Validated with direct measurements of aboveground biomass pools included in the project boundary from the project region (within the national boundary), demonstrating a statistically significant ($p < 0.05$) relationship - Model (ratio or regression) error quantified and assessed in parameter $Up_{,t}$ where p = woody *Why not apply the same requirements here and provide guidelines for acceptable statistical evidence (e.g., regression types) and equations for calculating error?* 2. Another approach would be to require project developers to test multiple EVS quantification methods (e.g., percent cover AND NDFI) and choose the most accurate or most conservative method.	

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		For both of these approaches, biomass data collected from the project area plots (or third-party data from the region with similar vegetation) could be used the fit the models and provide this quality control. Since data will be collected to directly measure change in biomass in the project area, this should be compared to calculated **Δ**EVS to show whether it is representative of what is known to be actually happening in the project area. If percent change in the quantified EVS metric is not similar to directly measured biomass change occurring over the same time period, then the method used to quantify EVS is not accurate for this specific context. Therefore, additional steps should be taken or another of the possible acceptable methods for measuring EVS should be tested. 3. In addition to the aforementioned steps, the methodology could provide a table to suggest which methods of quantifying EVS should be used given the biophysical and vegetation characteristics of the project area and control plots. The most credible and recent data from authoritative or peer-reviewed sources relating biomass to imagery and remote-sensing metrics should be used.	
86	Yale Carbon Containment Lab	(2) Performance Benchmark 2a. Setting a Control Area Based on Data at t = -5 Years: In Appendix 1, the Methodology requires project control areas to be	In the revised appendix, control plots are matched to the project area based on historic vegetative trend. A prior, significant downward trend (due to fire) would then have to be observed in the control plots in your case. As well, those

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		designated based on remote sensing data collected five years prior to the project start date. However, most post-wildfire reforestation projects occur within 1-2 years of a wildfire event, to preclude severe encroachment by shrubs, grasses, or other herbaceous vegetation. Moreover, ecosystem regeneration following a wildfire is largely determined by its prior wildfire history, i.e. a plot near the project area with a different wildfire history may not be representative of baseline regrowth in the project area. 5,6 *Recommendation*: For post-wildfire reforestation projects, the Methodology should allow the designation of control plots within the same burn area as the project, using remote sensing data collected shortly after the wildfire event or at t = 0. 2b. 250 Permanent Virtual Control Plots: Appendix 1 of the Methodology stipulates that 250 or more control plots must be designated remotely for each project. However, in the "Illustrated Example of Performance Benchmark Derivation" in Table 6, only 20 control plots are used to calculate the performance benchmark. There is an order-of-magnitude discrepancy between these two values. *Recommendation:* The Methodology should clarify which value is correct for the required number of control plots; or, if both are correct, explain this discrepancy. Many post-	plots closer to the project area (and so potentially within the same burn) are weighted more heavily in the control, improving the appropriateness of the match. The referenced table makes clear that it is *illustrative* (not illustrated), to show how the procedure works, not set methodology guidance. Minimum sample size is clearly specified in the appendix.

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		wildfire or other heterogeneous landscapes may not have 250 or more sites with similar fire histories and geomorphological attributes to use for comparable control plots. Furthermore, this may disincentivize small-scale projects, where setting aside 250 or more control plots may result in more land being used for controls than for reforestation.	
87	Shell	A novel approach to ARR project types, however, it seems to have some of the same risks i.e., the potential for projects to choose reference areas/control plots that benefit them the most. May be challenging to use in a situation of restoration of degraded forest (presumably 'remote sensing metric' method would need to be used to show biomass rather than just % cover?)	Percent cover approach dropped. Revised and expanded matching approach should be sufficiently standardized and quantitative to avoid gaming (there are no qualitative judgements in the selection of valid control plots).

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88	Biofilica	The methodology allows for two quantification approaches: an area-based and a census-based, with regard to the applicability of the census-based approach, the project activity may not result in land use and land cover change. We would like to request if there are defined criteria to identify	The requirement only specifies no change in "land use", thus no land cover definitions are needed. We have added clarity on "land use" referrring to the 6 IPCC "land use categories" (forest land, cropland, grassland, wetland, settlements and other land).

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		and quantify land use and land cover change in the projects, and if applicable, we would like to request the criteria.	
89	Biofilica	When choosing the area-based quantification approach, it is necessary to use the performance benchmark to define the project baseline as well as its additionality. In order to be possible, the observed rate of increase in vegetative stock on the control plots, when compared to the project area, must have the same characteristics. Despite a good explanation in the Verra Webinar, these characteristics are not well defined in the methodology, which may in the future generate misinterpretations by developers and generate methodological divergences between ARR projects around the world. Thus, it is plausible that Verra could include a greater and better delineation of the characteristics that should be taken into account.	The criteria to define matches between controls and project area are defined in detail in the methodology appendix (performance benchmark).
90	Biofilica	The proposed methodology makes no reference to the guidelines applicable to grouped projects in the first instance. Even though there are no significant differences in the use of the methodology, we emphasize the fact that, at the very least, a guideline should be included on how to use it in grouped projects.	Guidance is provided in the appendix to specify how the performance benchmark is developed for grouped projects. Otherwise, the operation of the methodology is identical for grouped projects and no further mention is made nor is needed (following precedent on other VCS methodologies).
91	Kennemer	Could Verra please clarify if existing CDM A/R methodologies will continue to be applicable for VCS ARR projects or is there a plan to	A final decision has not yet been made. Verra would publish any decision to phase-out the CDM A/R methodology and grace period in a timely manner.

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		phase them out?	
92	Mombak	Eligibility requirements should only look at the previous 5 years and should prohibit other land uses. We believe that the methodology should prohibit the inclusion of lands that (i) are enrolled in reforestation incentive programs, or (ii) have tree canopy on more than 10% of the land area on a per-hectare basis. We also believe the eligibility criteria should meet the following guidelines, in cases where reforestation takes place on land that was previously in agricultural production: a. Land parcels must be in continuous agricultural production for at least 5 years or fallow for 5 years or less. This criterion is based on the assumption that lands with at least 5 years of continuous agricultural would remain active, even as productivity declines through land degradation, for the duration of the project, thereby preventing reforestation. We believe this is a more realistic performance benchmark than the more than 10 years in the current methodology draft. Fallow lands should only be considered for inclusion in the project area if they were in agricultural production for at least 5 years prior to becoming fallow, and have been in fallow for no more than 5 years - which is the maximum period allowed before reclearing is prohibited in Amazon under Brazil's Native Vegetation Protection Law (NVPL) - without significant natural regeneration occurring during the fallow period.	Some of these comments reach beyond the methodology and are best addressed by Verra in the *VCS Standard*'s guidance around eligible project activities. The methodology deliberately allows inclusion of lands enrolled in reforestation incentive programs. Their baselines must be drawn from areas with similar policy in place, and as well they must show an implementation barrier (e.g. the incentive is insufficient to incentivize the tree planting). Such a project would meet expectations for additionality, and be accounted against an appropriate baseline (with an incentives policy already in place and some levels of adoption/enrollment). Appendix 1 of the VCS Standard v4.2 includes the eligible AFOLU project categories and there is no restriction to implement ARR activities in areas that has a canopy cover higher than 10%. Per Section A1.1 of the VCS Standad v4.3 document, "ARR activities are those that increase carbon sequestration and/or reduce GHG emissions by establishing, increasing or restoring vegetative cover (forest or non-forest) through the planting, sowing or human-assisted natural regeneration of woody vegetation." Re the 10 yrs demonstration, the bar should be high for allowing the simplified (zero) performance benchmark. 10 years would seem a minimum to confirm recalcitrance of land use. The fallow scenario described would require a 10 yr look back to confirm.

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		b. No alternative financial incentive programs for reforestation are in use. These include government-funded programs and other greenhouse gas (GHG) removal programs. Any landowner that is currently engaged in these programs should not be eligible to enroll in projects. Disincentives (penalties) for failing to reforest areas, however, will not disqualify land, as these are not effective mechanisms for overcoming economic barriers. It is critical to highlight that most, if not all, of the financial incentive programs in Amazon are for forest conservation, and not reforestation, given the importance of preserving lands held in Legal Reserve from being deforested. Put simply, this methodology should focus on areas where reforestation would not occur were it not for the sale of carbon credits.	
93	Mombak	4. Reassess the baseline every 10 years We support Verra's performance benchmark approach of comparing the increase in vegetative stocking between the project site and control sites. However, we believe that the baseline should be reassessed every 10 years versus every 5 in the draft methodology. Establishing a 10-year timeframe for baseline reassessment generates an accurate and smooth performance benchmark, given the cyclical nature of carbon removal on commercial forests due to harvesting cycles, which can be 7-8 years for eucalyptus plantations. A 10 year reassessment also allows more certainty	Currently no differenciation exists between ARR activities that restore native forests and others within the non-permanence risk tool. The 5 year re-assessment period reflects JNR and the evolution of thinking on fixed historic baselines. We are exploring instead a purely ex post baseline, which offers the following: • No potential for results to drive the application – better prevents gaming • Better attribution of project results, zeros out externalities (as compared to ex ante, which could, e.g. have a baseline be driven by drought, accounted against an ex post project not subject to drought) • Less complicated accounting and equations (mismatch of timing between baseline and project in current ex ante

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		in the development of projects which will attract more project developers and encourage those developers to create more projects. In addition to our recommended changes to the methodology, there are also requirements in the ARR methodology that align closely with Mombak's carbon removal principles. We agree that land parcels should not be included that would otherwise be reforested as a result of regulatory requirements, unless they are held in a Legal Reserve or Permanent Preservation Area and deemed additional. This is because Brazil's NVPL8 regulates that (i) 20-80% of a rural private land parcel must be held in Legal Reserve and (ii) ecologically sensitive areas (such as buffer zones around water bodies, steep slopes and mountaintops) must be held in Permanent Preservation Areas, and maintained as native vegetation. Landowners are technically required to address any deficits through native vegetation recovery or, in the case of land in Legal Reserve, off-setting is also allowed in certain situations. Historical rates of compliance are <10% in the Amazon9, enforcement is very weak, and insufficient funding mechanisms exist at national or local levels to support higher conformity to the law10,11. For many landowners, the transaction, opportunity, and establishment costs associated with achieving compliance are insurmountably large relative to their incomes12. This is consistent with the VCS definition of	application creates some confusion and added complexity of equations to align timeframes; i.e. current performance benchmark compares change in the baseline from t=-5 to t=0 to project from t=0 to t=5) • Ex post provides less investment certainty, however, the control plots are now matched in part based on historic change, which we expect to be indicative of future change, thus through methodology application that information is generated which can help inform investment

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		regulatory surplus, per section 3.5.3 of the VCS Methodology Requirements. Brazil, as a Non-Annex I country, does not systematically enforce compliance with the law, making these practices additional. Our vision is to restore native forests and hold them permanently in this state. As such, we would like to encourage mechanisms in Verra's Non-Permanence Risk Tools that will align with this vision and will convince developers and our buyers that these forests are not restored for the purposes of clearing the forest with timber harvest following the permanence period. We look forward to future discussions about mechanisms within the Non-Permanence Risk Tools that can provide this level of assurance.	
94	Shell	When using the performance benchmark in the area-based approach: If a project outperforms the control area (e.g., baren land), would the project be additional even if it was financially viable without carbon finance? If so, does the methodology safeguard against projects that may not be financially dependent on carbon revenue?	We have now revised to require demonstration of an implementation barrier in addition to use of the performance benchmark.
95	Shell	If the control area were instead plantations: Could the project simply be deemed additional for performing "better" than the control plantation? For example, if a project planted more and faster growing species?	Yes.

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96	Shell	The wording related to the government subsidies test is unclear. Does it indicate that a project may be additional (i.e., in need of carbon revenue) if other similar projects are dependent on government subsidies or it is additional despite receiving such subsidies. Please clarify.	the requirement states "... exclude any areas ... with presence/absence of any operating government-funded program providing incentives for tree planting that differs from the project area" So if the project operates in an area where a government incentive policy is administered, then control plots may not come from an area where no government incentive policy is administered. What this means in practice is that this kind of project will have a higher hurdle for additionality, because there is a high level of business as usual reforestation that must be accounted for. With the application of proportional additionality here, this is not a binary determination > a project can still produce a net benefit in such a landscape, it just has to plant more trees than its non-C project peers.
97	Shell	If a project only harvests a small portion of the project area (<10%), would the long-term average (LTA) still apply? If so, is this approach overly conservative? Would it not be more practical to allow projects to stratify harvested and non-harvested areas?	Good point. Methodology revised to allow project to be stratified to account LTA only in areas subject to even-aged harvest.
98	Shell	The appendix states that in order to use the performance benchmark an estimated vegetative stock (EVS) must be taken at t = -5 and reassessed every five years. This stock must be within +/-10% of the project area. There is concern that this requirement could be too strict and ultimately punish high performing project areas whose regeneration outpaces control plots by >10% in a five-year period.	That was only intended for *initial* stocks. This requirement has been stricken.
99	Shell	Does the methodology allow for restoration of degraded forests? P7. S4. Appears to allow	Yes. This is why the methodology deliberately does not

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		restoration of partially degraded forest, but this is not explicit. The need to account for 'pre-existing woody biomass' (P17, S8.2.2) appears to support this.	reference a forest definition.
100	Shell	How does Verra intend to reconcile the existence of two ARR methodologies? It appears the intention of this methodology is to improve upon that offered by CDM, however, it has not been classified as a revision. As such, per the VCS Standard, the two methodologies could exist irrelevant to the other. Does Verra intend this to be the case, or does the approval of the Verra ARR methodology preclude the use of the CDM ARR methodology?	Verra will publish the decision to phase-out the CDM A/R methodology and grace period in a timely manner.
101	South Pole	Other standards have a standardized excel file for the ER estimations. There are still doubts about the LTA calculation, and there will be for sure doubts about the leakage, and HWP estimations. Perhaps Verra could think about giving an example or a dummy calculation, so there are less questions about these estimations.	We will consider providing examples, but in the long run we are going to be digitalizing our methodologies, which should provide some structure for the types of calculations the stakeholder wants more guidance on.
102	Sylvera	- Sylvera welcomes this new methodology and recommends that it replaces the previous CDM AR ACM-0003 one as it is comprehensive and more conservative than the previous one. - Sylvera would also welcome a mandatory focus on quantifiable biodiversity outcomes for new ARR projects. The biodiversity crisis	Biodiversity is covered by VCS safeguards, and net posivite impacts on biodiversity are covered by SDVista or the CCB Standards.

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		is the climate's twin crisis. Too often, tree-growing projects do not maximise biodiversity recovery. Many ARR carbon projects are monoculture or polyculture exotic plantations, which sometimes can have a detrimental impact on biodiversity.	
103	TLLG	Components of the ARR Methodology where alterations could improve accessibility to agroforestry projects are: • Applicability conditions that exclude agroforestry activities where emission sources that are not included in the methodology could be significant (see Section 2.2); • Inclusion of investment analysis as an option for demonstrating additionality (see Section 2.3); • Expanding the conditions for assuming zero baseline emissions from tree biomass to include any land where it can be demonstrated that tree biomass has declined over the last 10-years (see Section 2.4); • An option to include default values for SOC other than the IPCC values in the CDM A/R Soil tool (see Section 2.5.2.3); • Standardised leakage discount factors that are more appropriate for agroforestry interventions (see Section 2.6); • Details of how the leakage module can be applied to generate a leakage discount factor for projects using census-based approaches (see Section 2.6); and • Clarification of the types of harvesting that require long-term average accounting (see	Applicability conditions that exclude agroforestry activities where emission sources that are not included in the methodology could be significant (see Section 2.2); > what do you suggest? They are quite broad compared to other methodologies. Restoration activities on wetlands are covered by WRC methodologies. • Inclusion of investment analysis as an option for demonstrating additionality (see Section 2.3); > this is included in Section 7 step 2b under "investment barrier" • Expanding the conditions for assuming zero baseline emissions from tree biomass to include any land where it can be demonstrated that tree biomass has declined over the last 10-years (see Section 2.4); > a trend doesn't reflect potential, and this should reflect potential. The bar should be high for using the simplified (zero) performance benchmark. • Default values for SOC were excluded from the methodology. • Standardised leakage discount factors that are more appropriate for agroforestry interventions (see Section 2.6); > what would those be? The revised leakage tool is expanded to look at commodity displacement and productivity enhancement for whatever the relevant commodity is (traditional ag, agroforestry …) • Details of how the leakage module can be applied to generate a leakage discount factor for projects using census-based approaches (see Section 2.6); > the tool operates identically for area-based and census-based

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		Section 2.8). Components of the ARR Methodology where additional guidance may help those applying the methodology to agroforestry projects include guidance on: • When there is considered to be a change in land use in the context of an agroforestry project (see Section 2.1); • Conservative ex-ante estimation of changes in tree biomass (see Section 2.5.1); • Stratification of project areas in an agroforestry context (see Sections 2.5.2.1 and 2.5.3.1); • Appropriate plot-based sampling approaches for different agroforestry systems (see Section 2.5.2.2); and • Calculating percentage uncertainty from stratified samples (see Section 2.7).	approaches. Also, many census-based projects will not involve a change in land use and thus result in no activity displacement, i.e. zero leakage. • Clarification of the types of harvesting that require long-term average accounting (see Section 2.8). > now specified (even-aged harvesting – clearcuts, shelterwoods and seed tree cuts) Components of the ARR Methodology where additional guidance may help those applying the methodology to agroforestry projects include guidance on: • When there is considered to be a change in land use in the context of an agroforestry project (see Section 2.1); > Table 1 has been clarified to reference IPCC land use categories (forest land, cropland, grassland, wetland, settlements and other land). Agroforestry is classified as either forest land or cropland, depending on the forest definition. If an improved/expanded agroforestry system changed the land use from cropland to forest land, it would not qualify for the census-based approach (and presumably the extent/scale of that transition would preclude the census-based approach anyway). • Conservative ex-ante estimation of changes in tree biomass (see Section 2.5.1); > this is not the principal use of a methodology, and the guidance is kept minimal and non-prescriptive. • Stratification of project areas in an agroforestry context (see Sections 2.5.2.1 and 2.5.3.1); > see parameter tables re sample designs. Stratification may always be used, but is not required. • Appropriate plot-based sampling approaches for different agroforestry systems (see Section 2.5.2.2); > again, the methodology is not meant to provide sample designs for users. Perhaps this is something that Verra would consider developing to support project implementation, e.g. sample field measurement protocols, sample designs, etc. (we recognize that these can be challenging in an agroforestry

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			context, so the need is there) • Calculating percentage uncertainty from stratified samples (see Section 2.7). > not necessary, and would be unmanageable from a methodological standpoint to lay out estimators for a wide range of sample designs. The statistics are well understood by VVBs.
104	TLLG	Carbon Pools and Emission Sources Some agroforestry interventions could meet the definition of ALM as well as ARR, which could affect the selected carbon pools and emission sources e.g.: • Above-ground non-tree biomass, litter and deadwood must be included if significant in ARR projects, but not ALM projects • SOC must be included in ALM projects, but must only be included if significant in ARR projects • N2O emissions caused by microbial decomposition of plant materials that fix nitrogen may be significant for some agroforestry activities • Agroforestry activities that take place in areas with livestock grazing that would require the inclusion of CH4 emissions from enteric fermentation and CH4 and N2O emissions from manure in the project boundary There may therefore need to be some applicability conditions that exclude agroforestry activities where emission sources that are not included in the methodology could be significant, or guidance on how these pools should be included if they are significant or when an	Livestock grazing is not an ARR activity, and so is not applicable under this methodology (which, as you point out, does not include emissions from enteric fermentation). In such a case the project would have to use a ALM methodology (which can include woody biomass pools). We are considering creating an agroforestry project development guidebook to help agroforestry PPs identify the most suitable approach for their context. The guidebook may include a decision tree for PPs to select the most appropriate methodology for their intervention (e.b., ALM v. ARR). N2O emissions from planting nitrogen fixing species now included.

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		ALM methodology should be used.	
105	TLLG	Area-based approach Stratification Stratification is mentioned as an option to improve precision but is not required by the methodology. The implementation of agroforestry activities, especially in a smallholder context, often includes considerable variation in baseline conditions and project activities, and factors (such as the end use of trees) that are not typically considered when designing stratified sampling for A/R projects, but that could influence long-term carbon stocks. Guidance on stratification of project areas in an agroforestry context could therefore help agroforestry projects to apply the methodology.	See parameter tables re sample designs. Stratification may be used, but is not required. Providing detailed guidance on sample designs and field measurement protocols is beyond the scope of an accounting methodology. However, it is intended to develop an annex with guidance on MRV in agroforestry settings, which could cover these considerations.
106	TLLG	Area-based approach - Soil organic carbon Agroforestry projects have the option of applying IPCC default values for changes in SOC if they result in land use change (i.e. they can be classified as A/R). IPCC default factors may not be well suited to agroforestry activities, however, and If area-based approaches were available for interventions that don't meet the A/R definition, alternative default values would be needed. Could there be an option for using alternative default values, if they have a sufficient evidence base?	This would introduce too much potential for gaming, shopping around for the best default value and will not be included to the methodology.

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107	TLLG	Census-based approach - Stratification The methodology suggests that when defining cohorts for monitoring "an appropriate representative sample would be a stratified systematic sample, within each annual cohort, selecting planting units systematically with a random start from the list of unique censused planting units." Agroforestry projects may benefit from guidance on defining cohorts in line with this suggestion, that takes account of different species and end uses etc.	Stratification may be used, but is not required. The parameter tables are not meant to be a user manual, nor serve as standard operating procedures. Projects will have to develop these kind of detailed step by steps, as well as sample designs, to guide the collection of field data and ensure that the "bare" requirements in the parameter tables and methodology are met. The methodology is deliberately non-prescriptive to allow flexibility and innovation for PPs seeking to improve cost efficiencies, while providing enough requirements to ensure minimization of bias (sample design, QA/QC procedures) and permit proper estimation and accounting of sample error (sample design), namely via these overarching provisions: 1. Be demonstrated to be un-biased and derived from representative sampling 2. Accuracy of measurements and procedures is ensured through employment of quality assurance/quality control (QA/QC) procedures (to be determined by the project proponent and outlined in standard operating procedures governing field data collection)
108	TNC	In general, we support: Switching from CDM-approved to VCS methodologies: Currently, Verra does not have its own ARR methodology; instead, it relies on methodologies developed under the Clean Development Mechanism (CDM). As mentioned in our 2019 public comments to the Technical Advisory Body for the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), we were concerned that many of the applying standards (Verra, Gold Standard, American Carbon Registry, etc) included methodologies developed under the CDM without additional	Thank you for providing this input to Verra.

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		requirements. Additionally, since the most recent Verra-approved CDM ARR methodology is from 2013, it raises questions about whether this is using the latest technology or science.	
109	TNC	In general, we support: Dynamic Baselines: The Nature Conservancy applauds the inclusion of background rates of restoration occurring in the project landscape as a dynamic input to the project baseline in the ARR methodology. In general, Verra should continue to prioritize and support dynamic baseline approaches. We also appreciate the novel approach taken to leakage accounting which better incorporates productivity, relative carbon stock differences between the project area and areas leakage will be displaced to, and the fact that leakage dynamics change over time. This is an improvement over leakage accounting in many methodologies and a major improvement over the CDM methodologies, one of which contained an error in the formulae used for leakage accounting.	Thank you for providing this input to Verra.
110	TNC	Finally, we recommend that Verra continues to track the remote sensing space; at some point, this data may be able to outcompete a census-based approach when it is able to detect change at the level of individual trees. It might be worth revisiting the methodology at that time.	Agreed, thank you for providing this input to Verra.

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111	Yale Carbon Containment Lab	(3) Carbon Credit Penalties 3a. Pre-Planting Project Area Preparation: The Methodology currently penalizes project developers for carbon lost during pre-project land clearing and site preparation: removal of shrubs, removal of litter, and damage to soil organic carbon (Sections 8.2.2, 8.2.6, and 8.2.7). However, the Methodology also describes distressed ecological conditions due to catastrophic natural events such as wildfire or the unfavorable course of natural succession as a barrier to implementation of the project activity, and as a means to prove the project's additionality (Section 7, "Additionality"). Clearing the project area and damaging pre-existing carbon stocks is therefore a necessary first step for many such projects, and enables more resilient growth and a larger carbon sequestration opportunity in the longer term. *Recommendation:* In instances when reforesting a landscape will prevent it from undergoing verifiably non-anthropogenic habitat conversion or degradation (e.g. shrub or grass encroachment after severe fires), or when project area preparation involves the removal of invasive species, projects should not be penalized for carbon lost during site preparation. Non-anthropogenic habitat conversion can be observed and quantified in selected control areas with the same wildfire or other severe disturbance history.	This methodology is not designed to predict land use conversions like those alluded to, nor to credit avoided emissions from such conversions. Where site prep, as part of the project activity, produces an emission, it must be accounted for to have an accurate accounting of net impacts.
112	Yale Carbon Containment Lab	The CC Lab has reviewed existing Agriculture, Forestry and Other Land Use (AFOLU) carbon	Thank you for providing this input to Verra.

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		offset methodologies that may be applicable for post-wildfire reforestation, and believes that the VCS Methodology may be particularly suitable for this increasingly common use case. By shortening the minimum length of the crediting period relative to other ARR offset methodologies, this Methodology has the potential to attract wide-scale participation from landowners who are unable to make a 50- or 100-year project commitment. This Methodology also allows project developers greater flexibility to choose sampling methods and operating procedures. We strongly support this advance. Below, we propose a set of clarifications and amendments that we believe will make this Methodology more suitable for adoption in post-wildfire and other climate-affected reforestation scenarios. The comments fall under four broad categories: (1) Tree Planting; (2) Performance Benchmark; (3) Carbon Credit Penalties; and (4) Monitoring, Verification, and Crediting.	
113	Yale Carbon Containment Lab	(4) Monitoring, Verification, and Crediting 4a. Periods and Timelines: Verra outlines its monitoring, verification, and crediting protocols for AFOLU projects in a set of general, external documents. However, the current draft of the Methodology neither refers readers to these documents, nor shares guidance on monitoring, verification, and crediting issues specific to this Methodology. This makes it difficult for non-	4a - Methodologies do not repeat guidance in the overarching *VCS Standard* or other VCS Program documents. This is so that Verra does not have to go into each methodology whenever updates are made to a Program document. 4b - The project would become unviable, however Verra is working on updates to the AFOLU NPRT to consider impacts of climate change outset of project development.

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		specialist developers to understand and adopt the Methodology. *Recommendation:* For improved clarity, all monitoring, verification, and crediting requirements would ideally be outlined in the Methodology itself. At the bare minimum, the Methodology should make explicit reference to external documents required to understand crediting protocols and timing for this Methodology, for example the "VCS Standard v. 4.0" to determine minimum and maximum crediting period lengths, the "AFOLU Non-Permanence Risk Tool" to calculate buffer pool deductions from credits issued, the "Registration and Issuance Process" to understand buffer pool credit cancellation and "time release," and any others. The Methodology should include resources (or reference to resources) on monitoring and verification timing and requirements, and on timing for credit issuance. The document should also clarify the timing of major Methodology-specific milestones, such as when the first verification after replanting should occur. 4b. Failure of Non-Permanence Risk Assessment Upon Subsequent Verification: Though Verra's Non-Permanence Risk Assessment Tool disqualifies projects which initially exceed certain risk thresholds, neither the Registry nor the Methodology address what might occur should a project fail a risk assessment during a subsequent verification. Post-wildfire reforestation	4c - Verra is working on a Projected Carbon Unit to help project proponents to cover the upfront costs. (https://verra.org/early-finance-carbon-unit-public-consultation/)

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		projects face changing, often increasing fire risk as replanted forests mature in the midst of a hotter and drier climate, and become more dense through natural regeneration after planting. A number of high-profile carbon offset projects have experienced fire-related reversals after reforestation.7 *Recommendation:* The Methodology should clarify how to proceed if a project's natural risk is deemed too great upon a non-initial verification. 4c. Heavily Discounted Upfront Credit Issuance: Credit issuance under the current Methodology occurs after each verification event, with the number of credits issued directly proportional to the amount of carbon sequestered in trees. As a result, while this aligns with actual sequestration, the project payback will be slow, potentially discouraging investment by parties who do not have immediate access to patient capital, such as many Tribal Nations and small landowners. In the CC Lab's experience, the significant upfront costs of reforestation are often a sufficient barrier to prevent replanting on non-commercial forestlands, and could inhibit wider adoption of the Methodology. *Recommendation:* Verra should allow the issuance of a discounted portion of the project's expected carbon credit generation up front after an initial verification, similar to CAR Climate Forward's Reforestation Forecast Methodology, to help directly defray the upfront costs of replanting. The project	

General Feedback			
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		proponent could have the option to, or be required to, transition back to a regular monitoring and verification cycle after initial credit issuance, and earn credits for carbon that is verifiably sequestered and stored.	