

SUMMARY AND RESPONSE TO PEER REVIEW COMMENTS

An update to the Methodology for Improved Forest Management of Non-Federal U.S. Forestlands was developed by ACR for potential approval by the American Carbon Registry (ACR).

All new methodologies and methodology modifications, whether developed internally or brought to ACR by external parties, undergo a process of public consultation and scientific peer review prior to approval.

The methodology was posted for public comment from September 15, 2021 to October 15, 2021. The methodology was reviewed by an independent panel of experts February 1, 2022 to June 15, 2022 . Comments and responses of the peer review process are documented here.

#	Reviewer #	Document Section	Reviewer Comment	Author Response	Reviewer Comment (R2)	Author Response (R2)	Reviewer Comment (R3)
1	1	Acronyms and Definitions	I am requesting clarification Commercial Harvesting: Within the definition, does “specifically excluded” refer to the requirement of “merchantable material” as it relates to meeting the requirements of Commercial Harvesting?	Harvesting of dead, dying, or threatened trees (regardless of merchantability) is not considered “commercial”, where a signed attestation from a professional forester is provided. Clarification on this point has been provided in the definition.	OK (R2), (R1). Issue closed.		
2	1	Acronyms and Definitions	Working Forest does not appear in this section. In Public Comment Response #3 it looks like “working forest” was removed from section 4.1. Did this action trigger a removal of the “working forest” definition?	The reference to a “working forest” has been removed in association with public comment response #3. The definition was therefore removed as well.	OK (R2), (R1). Issue closed.		
3	1	1.2-1.3	Summary of Changes Document states that Applicability Conditions 1.2, was updated to allow for long term forest management plans. This appears to have occurred in 1.3 (Sustainable Management Requirements)	I believe the document you’re referring to (“Summary of Proposed Modifications for IFM v2.0”) is outdated, as it describes changes from the methodology v1.3 to the initial v2.0 submission. We have updated the change log with the additional changes added during public comment (provided separately). Changes during peer	OK (R2), (R1). Issue closed.		

				review will be marked in track changes. As part of public comment process, the sustainable management requirements were separated from applicability conditions as a new, standalone section.			
4	1	1.3 & 5.5	How is an acceptable “long-term forest management plan” qualified; both in duration and content? I agree with TNC’s comment #36 where a clear requirement of 3 rd party certification would be beneficial to all. While FSC and SFI can be prohibitive to landowners having < 5,00 acres, ATFS certification is very attainable for smaller landowners.	We agree that 3 rd party certification is a rigorous safeguard for demonstrating sustainable forest management. However, obtaining 3 rd party certification does remain a significant barrier for small landowners in terms of time, money, and effort (Charnley et al. 2010). Special initiatives to address these barriers, such as FSC’s Smallholder Access Program or ATFS/SFI’s Small Lands Module, are still in early phases. Enrollment of U.S. family forest owners with less than 5,000 acres in forest certification programs is negligible (~4%) and nearly 80% of this demographic do not have long-term forest management plans (USFS National Woodland Owners Survey).	(R1) While I appreciate the simplicity of the approach for small landowners (<5,000 acres) to meet the sustainable management requirement, since 2010 it has become much easier for landowners to achieve ATFS certification. https://www.treefarmssystem.org/certification-american-tree-farm-system For a number of factors (evolving options such as PDA, improving carbon markets, and landowner education) many more small landowners with < 5,000 acres will be enrolling in carbon projects in the upcoming years. Requiring certification offers integrity to the Methodology and	We agree that forest certification is a great option for demonstrating sustainable forest management. However, the costs of forest certification (e.g., financial, administrative, opportunity) often outweigh the benefits for small-scale landowners (see American Forest Foundation 2021; provided separately). As such, forest	OK (R2), (R1). Issue closed.

For these reasons, offering an FMP pathway for small landowners to demonstrate sustainable forest management is important and reasonable. To offer a clearer and more verifiable requirement regarding approved forest management plans, we now clarify that FMP's to be prepared and signed by a professional forester (see sections 1.3 and 5.5).

safeguards to other landowners if aggregation is used in a project.

(R2) I think that at a minimum a management plan is necessary and agree there are limited options for 3rd party certification that is not burdensome for family forest owners. However, there is still the question of does a FMP *inherently* demonstrate sustainable forest management if it is prepared by a professional forester, as the author's response implies? I would think that at a minimum, there should be a requirement that within the FMP there is a section providing an explanation of how the plan represents sustainable forest management.

certification can't be the only option for demonstrating sustainable forest management and preserving the forest management plan option for small landowners is necessary.

However, in light of your comments, we have reconsidered the threshold for the forest management plan option, and now further constrain its applicability in section 1.3 to landowners owning < 2,500

						forested acres (changed from 5,000). Also, we have added additional reporting requirements in the newly added section 1.3.1 (in alignment with the Montreal Process Criteria) to the GHG Project Plan that further ensure sustainable forest management is sufficiently addressed by the FMP.	
5	1	1.3-1.4	Pools and Sources shows as 1.4. In the Summary of Changes document, this section is referred to as 1.3.	Please see response to comment 3.	OK (R2), (R1). Issue closed.		
6	1	4.1	In the Summary of Changes document, it states that discount rates of previous ownership class can be used	The acquisition to enrollment timeframe was extended from 1 to 5 years in response to public	Ok (R2), (R1). Issue closed.		

			when start date occurs within 1 year of land acquisition. However, Version 2.0 actually uses a 5 year period as per revisions made via Public Comment #18.	comment (also see response to comment 3).			
7	1	4.1	<p>Voluntary BMP's required in baseline constraints. While I certainly agree with following BMP's in forest management, I don't necessarily agree with adding this requirement to baseline constraints. I would like to understand why this was added? Landowners can and do ignore voluntary BMP's and do so in a legal manner. This varies by State.</p>	<p>We agree voluntary BMP's typically don't constitute legal constraints to forest management. However, for conservatism in baseline setting, we chose to treat them as legal constraints when published or prescribed by federal, state, or local government agencies.</p>	<p>(R1) In the spirit of conservatism in baseline setting, would you also consider "state sanctioned forestry programs" (listed in 1.3 Sustainable Management Requirements) as legal constraints? While participation in these "programs" is voluntary, participants receive a property tax reduction. While in the program, landowners must follow approved silviculture and harvest practices. Generally, landowners can pay to be removed from the program. If these programs are considered to be a legal constraint, I recommended adding such language to 4.1</p>	<p>State sanctioned forestry programs and tax reduction programs come in many forms and offerings, and ACR does not broadly specify them as baseline constraints. Rather, voluntary forestry programs are evaluated/treated as follows:</p> <p>1. Forestry programs that can be discontinued or</p>	<p>OK (R2), (R1). Issue closed.</p>

					(R2) OK	<p>terminated at any time are voluntary (i.e., not legally required or binding). However, the project must include any carrying costs, including any financial penalties or revenue losses associated with exiting the program, in the ACR financial implementation barriers test for additionality.</p> <p>2. In the event that entrance into a state sanctioned forestry program constitutes a legally binding</p>	
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						harvest restriction, the baseline must model the terms of the agreement as a legally binding constraint for its effective duration.	
8	1	4.3	Validated baselines fixed for crediting period. If legally binding constraints change during a crediting period, I am interested to learn why the baseline wouldn't be modeled accordingly at the next required full verification.	Please see related response to comment 15.	OK (R2), (R1). Issue closed.		
9	1	5.6	As it relates to leakage calculation. How would a situation be handled in a PDA aggregation where some landowners own >5,000 acres and other participating landowners owning <5,000 acres?	The project would use equation 21 to assign a 30% leakage deduction. The 20% deduction is only relevant to PDA's in which all landowners own less than 5,000 acres.	OK (R2), (R1). Issue closed.		
10	2	2.4	Consider adding to the Common practice test that	Clarified in 2.4 to "...evaluate the predominant forest industry	OK (R2), (R1). Issue closed.		

			the evaluation of technologies and practices applies to <i>lands not currently enrolled in GHG reduction projects</i> .	technologies and practices <i>on lands</i> in the project’s geographic region <i>not currently enrolled in carbon offset projects</i> ”.			
11	2	2.4	Although not a change from the previous version, the term “exceeds” when describing the proposed project relative to common practice is ambiguous, and implies quantification of an unnamed variable. If use of this term intends to suggest going beyond the carbon stock levels of common practice, it should be stated outright; however the remainder of the language in this paragraph describes comparisons. If the intent is for projects to <i>differ</i> from common practice, then it would be more direct to state that.	We have updated the common practice language in section 2.4 based on your suggestions.	OK (R2). Issue closed.		
12	2	2.4	I commend the authors for the changes to the language to remove similar ownership and focus on comparable	The land ownership classifier was purposely removed from the evaluation of common practice management. By removing this	OK (R2). Issue closed.		

sites within the region, but the removal of this classifier without further guidance can create confusion on how a project developer or verifier would determine silviculture or harvest regimes of similar sites. In some regions, and I can really only speak to the forestry of the regions I work in, ownership type can exert a significant influence on forest management practices, which I assume that recognition was why the common practice test was originally written to include this. The removal of that within-ownership type comparison leaves the door open for significant uncertainty on how to determine typical practices when differences between ownerships exist but forest type or ecological condition are similar. Is it determined by the practices that occur

classifier, comparable sites are defined according to forest type, ecological condition, or species/product mixture. We feel this is a clearer and fairer assessment of the additionality of project action.

There was a consistent advocacy in public comment (e.g., 1, 6, 9, 22, 33) that carbon offset methodologies consider the impact of carbon sequestration separate from landowner motivation. They must demonstrate the project goes beyond the management of similar forests, regardless of their ownership class.

			on the greatest number of acres?			
13	2	2.4	Examples of what is included in ecological condition should be included. Does this include stocking levels, size-class distribution, site index/ soils, lack of regeneration (perhaps from herbivory), presence of non-native or invasive plant species? Further specificity to provide transparency benefits ACR and project proponents by reducing potential negative criticism on “over crediting” as well as providing greater opportunities for landowners seeking to improve forest conditions to overcome financial barriers through participation in carbon markets.	Section 3 has been updated to state “...strata should be defined on the basis of parameters correlated to forest carbon stocking...”. The accuracy of stratification is quantified within an associated confidence interval. Please note that while more examples could be provided, footnote 9 clarifies that the bulleted list is not exhaustive.	OK (R2). Issue closed.	
14	2	3	Moving stratification to a section before Baseline is a significant improvement, as well as the stating that applies to both baselines	Please see response to comment 13.	OK (R2). Issue closed.	

			<p>and with-project scenarios. Does ACR accept any definition of forest cover type a Project Proponent chooses to define differences among stands. There can be significant challenges to translating cover/ habitat types used by different agencies (e.g. Kotor habitat types and FIA cover types). This classification seems like it may have importance to defining yield curves then used in baseline projections, especially when stratification is based on different cover types when then are modeled differently.</p>			
15	2	4.1	<p>With regard to comments 31 and 45 that suggest periodic review and, if necessary, updates to baseline scenarios: allowing updates to <i>ex post</i> stratification based on relevant changes to with-project scenario management while requiring baseline assumptions to be</p>	<p>We have clarified in section 2.4 that “Regulatory surplus must be confirmed at each verification” and in section 4.1 that “If new legal constraints are enacted during a crediting period that legally prohibit the modeled silvicultural practices or harvest removal rates, the baseline must be re-modeled on a forward</p>	<p>OK (R2). Issue closed.</p>	

			<p>held constant throughout the project period seem to be inconsistency. While this might be justified based on a conservative approach (as stated in the Author Response section to comment 31, it seems that policy or market changes that elicit management resulting in less intensive harvest (while still conforming to an approach of maximizing NPV) would not result in a decline in baseline, as is stated in the response, but a higher long term average. This would result in a more conservative estimate of ERTs over the project period. As such, I find the reasoning and the response to these concerns lacking, and would suggest further consideration by ACR of allowing periodic baseline review.</p>	<p>moving basis respecting these legally binding constraints for the remainder of the crediting period”. Section 7.3 was also updated to stating the verifier must “...provide a reasonable level of assurance that the ERT assertion <u>exceeds regulatory surplus</u> and is without material discrepancy...”.</p>			
16	2	4.1.1	<p>Given the interest in the removal of “similar ownership” from the</p>	<p>Section 4.1.1 was updated to state “One or more of the following sources must</p>	<p>OK (R2). Issue closed.</p>		

			common practice test, a description of how regional common practice compares to the baseline scenario should include how that common practice was classified in terms of not just silviculture and harvest, but ecological condition as well, may be warranted here.	substantiate the choice of baseline silvicultural prescriptions <u>and their relevance to the ecological conditions of the project area</u> ".			
17	2	4.1.1	Are there necessary variables for inclusion in baseline silvicultural prescription descriptions that relate to retention, such as TPA, BA, QMD, species retained? What about assumptions of logging slash treatment, or treatment of cull trees? These details seem desirable, if not necessary for baseline estimations.	The text has been updated to "Descriptions of baseline silvicultural prescriptions, including trees retained (<u>e.g., residual volumes, species</u>)..."	OK (R2). Issue closed.		
18	2	4.2.1	Perhaps there is additional documentation of SOPs elsewhere and not contained with this IFM methodology, but I find the description of procedures to	We updated Section 4.2.1 in track changes. It now states "The GHG Project Plan must detail what model is being used and what variants and calibration processes have been selected. All model	OK (R2). Issue closed.		

be included in the GHG Project Plan for baseline projections (same comment for With-Project estimations) to be lacking in relevant detail. What requirement must Project Proponents follow or methods used for determining growth and yield curves that would justify a verifier decision to approve or not approved model inputs and outputs? The yield curves in particular are of interest not only because of the direct impact on tree carbon changes, but also the assumptions made in selecting an appropriate model to represent growth. Assumptions of continued growth trends based on past decades may not be justified for some species in some regions, where mortality from insect pests or other stressors are having significant impacts to tree mortality and stand

inputs and outputs (e.g., plot data, model selection, geographic variant, calibration for site-specific conditions, tree list outputs) must be available for inspection by the verifier, and the verifier shall document the methods used in validating the growth and yield model in the validation report.”

The only model used in project development under this methodology to date is FVS, which is parameterized for local conditions including insect and disease. As such, we’ve narrowed the list of pre-approved growth models to FVS in section 4.2.1. Project Proponents wishing to use other potential models must seek approval by ACR and demonstrate the models are peer reviewed, used only for their relevant scope, and parameterized for specific conditions of the site (including the relevant stand conditions you mention).

			productivity. How are these determinations handled? Are there SOP's?	The ACR Validation and Verification Standard provides additional detailed steps for VB assessment, including model quantification.			
19	2	8	This comment refers to a response to comment 10, where the author's response is that ACR has added a new equation (30) denoting the calculation of "removals"... Should this be changed to equation 31? #30 deals with ERTs, whereas #31 defines conditions of $REM_{RP,t}$	You're correct equation 31 references the calculation of removals.	OK (R2). Issue closed.		
20	3	General	One overall suggestion is to provide a roadmap or other graphic in an early section of the methodology to help guide a project proponent in making choices for the project implementation.	Thanks for this suggestion. While we agree that project implementation and many of the concepts introduced in the methodology are complicated, but at this time we have refrained from adding another graphic. The methodology (particularly sections 1 and 2) walk through project implementation in detail. We would also point out that we have an ACR IFM primer , which more concisely lists the steps	OK (R2) (R3) Thanks for the response. May I suggest in section 1.1 that you reference the primer.	Footnote referencing primer added to section 1.1.	OK (R2), (R1). Issue closed.

				involved in project implementation.			
21	3	Acronyms	DBH is not defined	DBH is now included in acronyms list.	OK (R2), (R3). Issue closed.		
22	3	1.2	Should you add owner ship for the entirety of the project creditng period?	Added "...and throughout the crediting period" to section 1.2.	OK (R2), (R3). Issue closed.		
23	3	1.2	Bullet 1 says non-federally owned and this foot note indicates the projects can be on federal land as long as there is a contract that the project developer has a contract to retain carbon rights for the length of the project. Is that correct? Should this footnote be included in the text?	That's correct federally owned land is only eligible when full control of timber and carbon rights reside with a non-federal entity for the minimum project term. We could consider adding this direct to the text, but feel it is better suited as a footnote.	OK (R2), (R3). Issue closed.		
24	3	1.3	FSC, ATFS, etc. - at least one?	Yes, 1.3 states "...must adhere to one or a combination of..." and bullet states "...FSC, SFI, or ATFS...".	OK (R2), (R3). Issue closed.		
25	3	1.3	BIA - Not defined in the acronyms list, And is the proper name, Dept of Interior, Bureau of Indian	Added "Bureau of Indian Affairs" to acronyms and definitions.	OK (R2), (R3). Issue closed.		

			Affairs? The url is bia.gov so BIA is probably ok.			
26	3	Table 4	CH4 Just confirming that this is correct that methane should be included since carbon dioxide and nitrous oxide are excluded	Thank you for bringing this to our attention. The specific accounting of CH4 in this equation is a legacy of the methodology, which goes back to 2011. After reviewing other relevant and current ACR GHG methodologies (e.g., mine methane capture, landfill gas, ozone depleting substances) that quantify combustion related CO2e emissions, we can confirm they do not include accounting for CO2e emissions from CH4 or N2O. California ARB methodologies similarly exclude accounting for CO2e emissions from CH4 and N2O. The reason is that, for those combustion-related activities, CH4's contribution to total CO2e emissions are less than 0.5%. Put simply, those CH4-related CO2e emissions are considered trivial, negligible, and insignificant, and fall well below ACR's de minimis threshold. More than 99% of emissions related to biomass burning are accounted for via	OK (R2), (R3). Issue closed.	

				<p>quantifying the carbon stock burnt in metric tons via equations 1 and 2. Several U.S. EPA reports support this assertion (see here and here).</p> <p>Therefore, we have updated table 4 to confirm CH4 emissions from biomass burning are negligible. We have deleted equations 4 and 16. Equations 13 and 22 were also updated and equation 25 and 31 footnotes were deleted.</p>			
27	3	Second table p 13	Market Leakage - Do you need to define what gases are of interest as you did above?	We clarified that the market leakage deduction is relevant to CO2 emissions.	OK (R2). Issue closed.		
28	3	2.1	Forestland is not defined in the list of acronyms and definitions	“Forestland” is defined in the definitions/acronyms as “...land at least 10 percent stocked by trees of any size, or land formerly having such tree cover, and not currently developed for non-forest uses. Land proposed for inclusion in this project area shall meet the stocking requirement, in aggregate, over the entire area”.	OK (R2). Issue closed.		

29	3	2.2	As I understand this, all three items must be included to delineate the project boundary. Would a property parcel map exist on tribal land? Or is a parcel named something else on the BIA maps of federally recognized tribes?	Added "...or recognized equivalent" to referenced bullet.	OK (R2), (R3). Issue closed.		
30	3	2.4	Should you indicate what is evaluated. For instance the existing laws can be reviewed and noted. What I think you want is a review of the project area to ensure they are in conformance or compliance with existing laws etc.	Added "...relevant to the project area..." in 1 st paragraph of 2.4 regulatory surplus section.	OK (R2), (R3). Issue closed.		
31	3	2.4	Is there some reason to use > or < rather than less than or more than. This is the only use of a character rather than a word outside of the equations	We have made this change throughout.	OK (R2), (R3). Issue closed.		
32	3	2.4	Sentence beginning "The implementation barrier	The ACR Standard defines three pathways for passing the	OK (R2), (R3). Issue closed.		

			test....” Should this be “financial”?	implementation barriers test: financial, technological, and institutional. This section focuses on financial implementation because it is the most widely used, but technological or institutional barriers may also be relevant. We clarified “...financial...” barriers in the second sentence of this paragraph.			
33	3	2.4	Last paragraph - GHG is not in the acronyms and definitions list.	Added “GHG” to the acronyms.	OK (R2), (R3). Issue closed.		
34	3	2.4	Last paragraph - These are not mentioned in the introduction above. If they might be relevant shouldn't there be more said here. During verification the VVB would have to assess all barriers, Financial, technological or institutional.	All projects must adhere to the ACR Standard as well as the methodology requirements. ACR Standard table 3 further defines technological and institutional barriers.	OK (R2), (R3). Issue closed.		
35	3	2.5	extreme weather events include fire, flooding , hurricanes, tornados etc. I	We include these examples in the sentence starting “Project specific risk factors...may include...”.	OK (R2), (R3). Issue closed.		

			suggest revising the sentence.	Extreme weather events are also referenced in the ACR Risk Tool used for determining buffer contribution.			
36	3	4.1	Table 1 - Does this include federally recognized and non-federal recognized tribal land?	We have added a footnote to table 4 that “Federally recognized tribes must use the “Tribal” ownership class. Non-federally recognized tribes are considered private ownerships and must be classified under either the private industrial or private non-industrial ownership classes, depending upon ownership characteristics”.	OK (R2), (R3). Issue closed.		
37	3	Equation 4	GWP term - Will you be updating the GWPs? And if not, please explain why you are using SAR in this document or in the ACR Standard.	Equation 4 has been deleted in conjunction with response to comment 26.	OK (R2), (R3). Issue closed.		
38	3	Footnote 14	assume there are no later versions, but just checking.	This footnote is no longer relevant (see also response to comment 26).	OK (R2), (R3). Issue closed.		
39	3	Equation 8	Text below “If years....”. Suggested edit - If the years..	Added “the” as suggested.	OK (R2), (R3). Issue closed.		
40	3	Equation 9	Text below – same as above	Added “the” as suggested. Same change made in equation 10.	OK (R2), (R3). Issue closed.		

41	3	4.2.1	Paragraph at bottom of p 29, "If the output for the tree is the volume" Do you mean the output from the model for a tree is	Changed to "If the model output is volume...".	OK (R2), (R3). Issue closed.		
42	3	Footnotes 16 and 18	This is important to someone using the methodology. I suggest moving the comment into the text.	Additional text has been added ahead of each footnote for context. The full reference has been retained in the footnote.	OK (R2), (R3). Issue closed.		
43	3	4.3	"Once validated for a crediting period, a project's baseline scenario is fixed, regardless of any changes to legal constraints that may occur within the crediting period." - I'm not sure what this means? It could be interpreted very broadly by a verifier. Do you mean only land ownership or other issues? It might be helpful to define further.	This sentence has been updated to state "Once validated for a crediting period, a project's baseline scenario is fixed, <u>with the exception of any changes to legal constraints that may occur within the crediting period</u> ". Please also see responses to comment 15.	OK (R2), (R3). Issue closed.		
44	3	4.4	"It is important that the process of project planning consider uncertainty. Procedures including	Changes made as suggested.	OK (R2), (R3). Issue closed.		

			stratification and the allocation of sufficient measurement plots can help ensure low uncertainty.” - Suggested edit - It is important that uncertainty be considered as part of project planning. Or something like that. suggest removing 'ensure low' and inserting ' minimize'				
45	3	5.5	“There may be no leakage beyond de minimis levels through activity shifting to other lands owned, or under management control, by the timber rights owner.” - This is a good piece of information but it seems out of place. It might be more appropriate to be placed after the next paragraph.	Sentence was removed but information incorporated into subsequent paragraph.	OK (R2), (R3). Issue closed.		
46	3	5.5	“For tribal lands, demonstration of a current BIA approved forest management plan or	This has been clarified in section 5.5.	OK (R2), (R3). Issue closed.		

			adherence to sustainable forest management practices informed by traditional knowledge, as further specified by section 1.3.” - federally recognized tribal lands				
47	3	5.6	“Where the project is an aggregated or PDA consisting of small private landowners (each owning <5,000 forested acres) and project activities decrease total wood products produced by the project relative to the baseline by 25% or more over the crediting period, the market leakage deduction is 20%.” - PDA isn't defined in the acronym list.	PDA is now defined in the acronyms.	OK (R2), (R3). Issue closed.		
48	3	7.2	This section does not discuss quality control for the methodology. It does focus on the final number on emissions reductions. This does not provide any	Projects using this methodology must also conform to requirements in the ACR Standard and the ACR Validation and Verification Standard. Chapter 9 of the ACR Standard more broadly	OK (R2) (R3) I appreciate your comments. As practical matter, verifiers frequently find that the project	The scope of validation and verification activities is now further defined in sections 7.3	OK (R2), (R1). Issue closed.

			<p>guidance for validation or verification. I would be happy to discuss further.</p>	<p>outlines ACR validation and verification requirements. The ACR Validation and Verification Standard includes over 50 pages explaining the process and requirements in further detail.</p>	<p>developer is not familiar with the ACR V/V Std or other requirements, and frequently are not as familiar as you would expect with the ACR Std or even data requirements of the methodology. The expectation is that the VVB should somehow fix it. I would encourage you to update the section specifically discussing data requirements.</p>	<p>and 7.4. These sections specifically address required documentation and data.</p>	
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