

RESPONSE TO PEER REVIEW COMMENTS



An Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal US Forestlands was developed by L&C Carbon LLC and CE2 Carbon Capital, based on an existing American Carbon Registry (ACR) approved IFM methodology, and submitted to ACR for approval through the public consultation and scientific peer review process.

The methodology was submitted to ACR on March 8, 2011. ACR conducted its standard internal methodology screening and provided this to the methodology authors on March 23. The authors submitted a revised methodology and supporting documentation on April 5.

The methodology was posted for public comment from April 18 – May 13, 2011. Public comments and responses by the authors are documented elsewhere.

Following public consultation, the methodology was submitted to three anonymous peer reviewers, experts in the field of forest carbon methodologies and forest management in the United States. Peer review comments and responses are summarized below.

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General / Overall Comments by Peer Reviewers

	1st review	Response	2nd review	Response	3rd review
1a	<p>In general, the approach using NPV maximization may be a reasonable way to set project area-specific baselines for IFM projects. However this approach raises a number of concerns.</p> <p>(a) The advisability of fixing a base discount rate in the methodology although the rate is reasonable for the U.S. (as opposed to providing guidance on deriving a rate, which would be</p>	<p>Regarding (a), We believe that requiring project proponents to develop project specific baseline NPV calculations and having them update them on a periodic basis would be unduly burdensome and would create significant variation in ERT calculations from one property to the next.</p>	<p>OPEN- The discount rates are a critical component of this methodology. Although an approved ACR methodology fixed a discount rate at 6% in real terms, this rate applied to all properties. Given the critical nature</p>	<p>For response see Appendix 1 below</p>	<p>ACR considers this a policy decision, rather than methodological issue, and has determined not to give the methodology an automatic</p>

	1st review	Response	2nd review	Response	3rd review
	<p>expected to change over time with market conditions and risk tolerances). In particular, methodology developers should consider provisions for periodic revision to the discount rate.</p>	<p>Rather than place this requirement on the project proponent, this methodology seeks to create a transparent, conservative, and verifiable baseline assumption that are based on examination of FIA data, review of available published literature, and testimonials from experienced natural resource professionals. This approach is consistent with the ACR Forest Carbon Project Standard. At the end of the first crediting period, all project assumptions are re-assessed and adjusted as necessary in order to qualify for renewal to the second crediting period.</p>	<p>of the discount rates and high variability in interest rates over the last decade, we feel strongly that a revision of the discount rates must be provided at periodic intervals in the methodology (perhaps at every baseline revision every 20 years). For example, in the Brookfield research report cited, in two years of extraordinary financial turmoil discount rates moved from 4.5-5.0 to 6.0-7.5%.</p> <p>Note two other factors of our comments (a1) the methodology should involve 2 or more averaged sources such as those listed in (a2) for updating the discount rate so adjustment in rates is not discretionary by project proponents; (a2) the primary sources for the 6% discount rate around which all the other discount rates are</p>		<p>“expiration” date if discount rates are not re-calculated. As noted in Appendix 1, ACR will have the chance to re-examine all baseline assumptions (including but not limited to discount rates) at the interval of crediting period renewal , here 20 years. ACR also has the option to retire any methodology at any time, even sooner than 20 years, if it is no longer consistent with best practice. This gives ACR ample means to retire the methodology if the discount rates are no longer</p>

	1 st review	Response	2 nd review	Response	3 rd review
			based should be referenced in the methodology and not in supplementary materials, which is NOT the Brookfield paper, but MB&G, Sewall, and Sizemore surveys.		conservative.
1b	(b) Net ERT calculations do not seem to take into account cases where with-project stocks are declining (after harvest or natural disturbances for example) or where with-project stocks are below the baseline long-term average (in which case it appears that net positive ERT's could still be calculated).	Regarding (b), In any particular year (t) project stocks may be declining or below the 20-year baseline average (T). While it is possible to have net positive ERTs when below the 20-year baseline the calculations are only positive if the delta in the with-project (or Project t) case is greater than the delta of the without project case (Baseline t) for any particular year. In other words, the project always has to outperform the baseline over time (both on an annual basis and over the entire crediting period) before ERTs are positive. We have changed the order of the baseline determination section (Section C3) to better reflect situations in which the $\Delta C_{BSL,t}$ will be nonzero (time	OPEN- the answer was internally inconsistent; positive credits should NOT be creditable when stocks drop below baseline in any particular year per ISO conservative baseline guidance (also see analogous comment C3-1) "The ISO 14064-2 principle of conservativeness must be applied for the determination of the baseline scenario. In particular, the conservativeness of the baseline is established with reference to the choice of assumptions, parameters, data sources	For response see Appendix 1 below	CLOSED

	1 st review	Response	2 nd review	Response	3 rd review
		<p>periods before T). We also added a second graph in the methodology document to illustrate this point (Figure 1a & 1b). And finally we changed section G1 adding both text and equation 24 in an attempt to better demonstrate the inter-temporal working of the ERT allocations</p>	<p>and key factors so that project emission reductions and removals are more likely to be under-estimated rather than over-estimated, and that reliable results are maintained over a range of probable assumptions.”</p> <p>As well, it is still unclear how fluctuating stocks are accounted in the methodology (what happens if net is negative for a given period? Is this a reversal? If so, the methodology should make this clear)</p>		
1c	<p>(c) The inclusion of costs is another factor that must be more explicitly addressed; particularly income taxes are not addressed in the glossary upfront</p>	<p>Regarding (c), Silvicultural costs (site prep, planting, intermediate treatments, harvesting, etc.) are all part of a Net Present Value calculation. To add taxation, would be unduly cumbersome for the project developer since different states and municipalities may all have different methods of taxation (ad valorem, yield or</p>	<p>(a) OPEN (minor) - Clarify in the methodology that IRR and NPV are before taxes.</p>	<p>On page 13 of the methodology (section C1 Identification of Baseline) it states that inputs for the NPV calculation are a function of carrying costs. In the</p>	<p>CLOSED</p>

	1 st review	Response	2 nd review	Response	3 rd review
		severance) which if they are consistent across either acres, volume, or value should lead to the same optimal management regime decisions reflected in NPV.		Scope and Definitions (Section A1) carrying costs are defined as <i>“Property taxes, mortgage interest, and insurance premiums”</i> . We therefore do not believe we need to clarify that NPV is <i>“before taxes”</i> .	
1d	(d) Carbon accounting under the project activity is not clearly addressed in this version of the methodology to discourage non-conservative credit claims. Setting the baseline equivalent to maximizing NPV ignores multiple situations where historical management has resulted in less frequent entries of lower volumes of wood. A modification of discount rates to take into account common practice for particular landowner types and regions may be necessary to avoid potential for large <i>“hot air”</i> claims. Also, carbon credits from the project activity will need to be claimed in some type of maximum based on average scenario to avoid claims only	Regarding (d), we agree with the comment submitted by Aitkin County (Minnesota) Land Department, <i>“...(the) NPV approach better levels the playing field for forest managers. The regional approach establishes a baseline that all are measured against – rather than against your own history. In other words, under some systems good operators are penalized for their historical good carbon management and bad operators can benefit by making relatively minor changes. I think that this</i>	(b) CLOSED		

	1 st review	Response	2 nd review	Response	3 rd review
	at peaks during harvest cycles.	<p><i>methodology will be fair to forest managers and effective at sequestering carbon via IFM”</i></p> <p>In addition, we chose the discount values to be used for NPV maximization based in part on our examination of the FIA data (our analysis is attached under separate cover) which shows that different landowners vary in their harvest decisions which is reflected in the variation of age classes per ownership group. It is very difficult to determine discount rates utilized by landowners particularly for Non-Industrial forest landowners, and the scientific literature does not contain discount rate values (to our knowledge). However, it is clear that NIPF do harvest (otherwise the FIA age class distribution would show all forest age classes in old growth conditions). Our methodology seeks to assign conservative discount rate values for broad ownership classes and take this variability</p>			

	1 st review	Response	2 nd review	Response	3 rd review
		of harvest decisions into account by setting different discount rates. A lower discount rate reflects less frequent entries for wood removal.			

A1 Scope and Definitions

	1 st review	Response	2 nd review	Response
1				

A2 Applicability Conditions

	1 st review	Response	2 nd review	Response
1	<p>(a) Activity shifting leakage – definition too narrow and not conforming with ACR Standard. Activity shifting leakage not necessarily restricted to lands under the control of the project area timber rights owner). For example, what if a timber property is purchased immediately prior to project start? Obviously there would be a risk of activity shifting leakage caused by the previous property owner, however it would not be accounted for with the present treatment of leakage in the methodology. The methodology must address this scenario.</p> <p>(b) The scope of certification for forest ownerships is poorly defined outside of the</p>	Regarding (a) We disagree that activity shifting leakage definition is too narrow and that is not in conformance with the ACR Forest Project Standard. Project proponents must address activity shifting leakage that result from their management practices, not management decisions made by other landowners (which the project proponent would have no reasonable way of quantifying since the other landowner is not a part of the project activity). Tracking	<p>(a) CLOSED</p> <p>(b) CLOSED</p>	

	1 st review	Response	2 nd review	Response
	project area in D6 regarding leakage.	<p>other landowners outside of the project area is not a requirement of the ACR Forest Project Standard.</p> <p>Regarding (b) the methodology text in D6 has been modified to clarify requirements. In addition, since all major forest certification systems require a landowner to include all of their landholdings as a requirement of participation, we felt that it would be duplicative in the methodology document.</p>		

A3 Pools and Sources

	1 st review	Response	2 nd review	Response
1	<p>The exclusion of a number of the pools based on a <i>de minimis</i> assumption is not justifiable scientifically in terms of lying dead wood and forest floor, which should both be accounted as “included/optional.”</p> <p>(a) In terms of lying dead wood, this pool should be required after a timber harvest treatment set at biomass removal threshold, as its removal for biofuel, pulp, firewood or other products is potentially a significant unaccounted loss of carbon stocks.</p> <p>(b) In terms of the forest floor, this pool</p>	<p>Regarding (a) the <i>de minimis</i> definition used by ACR and other major carbon programs is meant to strike the appropriate balance between scientific rigor and practical economic considerations associated with carbon monitoring. While lying dead wood and forest floor vegetation are important components of forest ecosystems, from purely a</p>	<p>(a) CLOSED</p> <p>(b) CLOSED</p>	

	1st review	Response	2nd review	Response
	<p>should be required when site preparation activities post harvest disturb the floor via plowing, subsoiling or similar activities otherwise potential emission sources are unaccounted; but can be conservatively excluded if logging operations are documented as same between project and baseline scenarios.</p>	<p>carbon accounting point of view--they may or may not be important to project ERT claims. The de minimis threshold is correct in allowing project proponents to determine on a project by project basis if changes to these pools as a result of the project activity are having a significant impact on carbon claims. If they are, then they will need to be measured. Requiring them to do so (even in cases where they are not having a significant impact on carbon claims) will add significant additional carbon monitoring costs for negligible impacts on carbon benefits associated with the project activity.</p> <p>In addition, under intensive management operations as mentioned in your comment (b), keeping these pools optional would appropriately make project claims conservative since as part of the project activity the NPV (hence harvest frequency) is lower compared to baseline</p>		

	1 st review	Response	2 nd review	Response
		conditions.		

A4 Methodology Summary

	1 st review	Response	2 nd review	Response
1				

B1 Project Eligibility

	1 st review	Response	2 nd review	Response
1	Forestland definition should include minimum area of 1 acre and should not include “formerly having such cover” for an IFM project activity.	Agree, definition has been changed and reference to “Formerly having tree cover” has been removed from the document	(a) CLOSED	
2	OBSERVATION: As a point of clarification, private industrial and tribal ownerships must provide 1 of 3 types of evidence listed here, or all 3?	One of the three, not all three. Document has been modified to clarify this point.	(b) CLOSED	

B2 Project Geographic Boundary

	1 st review	Response	2 nd review	Response
1				

B3 Project Temporal Boundary

	1 st review	Response	2 nd review	Response

	1 st review	Response	2 nd review	Response
1				

B4 Additionality

	1 st review	Response	2 nd review	Response
1	<p>Common practice is the weakest of the three components of the test as it will not be modal as legal requirements, and will also not be quantifiable like financial implementation barrier. Methodology developers might consider whether quantitative thresholds for defining common practice within a forest owner class within a state based on expert opinion should be used, particularly since common practice affects renewal but may be an issue for ACR.</p>	<p>The methodology as it is currently written is consistent with the ACR Forest Project Standard on additionality. The approach described (of using common practice) is well established in several existing IFM carbon methodologies available for use in the U.S. Rather than setting quantitative thresholds for common practice, we believe that this methodology should continue to leave specific determinations to the project proponent, because they must justify common practice during third party verification (to ensure it is rationale and defensible). In addition, third party verifiers deploy local experts familiar with common practice for a range of landowners in a particular geographic region.</p>	CLOSED	

B5 Permanence

	1 st review	Response	2 nd review	Response	3 rd review
1	The issue of the discrepancy between the project length of 40 years and the crediting period of 20 years (renewable) must be more fully addressed in the methodology due to its multiple implications regarding the baseline and management obligations for the 20 years, but may be an issue for ACR.	We disagree that there is a discrepancy. Per the ACR <i>Forest Carbon Project Standard</i> , all forest projects will have a 40-year minimum term. The 20-year Crediting Period means the baseline, once defined, can be projected and used for 20 years, then it has to be reevaluated in order to renew for another 20 years. Crediting Period is the period of baseline validity; to renew the proponent has to reevaluate the baseline, demonstrate additionality, and submit a new GHG Project Plan.	CLOSED. The predictive power of modeling projections beyond 10 years is generally weak. However, if the issue of periodic modification of NPV based on survey results is resolved per comment (1A) at the beginning of the review in general comments, then this issue can be closed.	See response in Appendix 1 below	CLOSED

C1 Identification of Baseline

	1 st review	Response	2 nd review	Response
1	Unclear how discount rates in Table 1 were derived. Methodology developers should show methods regarding how FIA data was analyzed. Excel spreadsheets and formula from peer-reviewed sources should be provided to provide transparency in these calculations of discount rates. What is the	Discount rates utilized in NPV calculations are typically not published in the scientific literature for all the ownership classes proposed in this methodology. But we have provided a separate document	CLOSED	

	1 st review	Response	2 nd review	Response
	quantitative rather than theoretical justification for a 1-2% adjustment in discount rates for amenity values for particular landowner types nationwide?	that describes the process we used to derive the discount rates by ownership classes (under separate cover). We believe our discount rate values are conservative based on examination of FIA data, review of available published literature, and testimonials from experienced natural resource professionals.		
2	<p>Par 7, sentence 3 currently reads:</p> <p>“Project Proponents use the baseline discount rate values for NPV maximization for the appropriate ownership class and run a project scenario for purposes of increased carbon sequestration.”</p> <p>Should read:</p> <p>“Project Proponents use the baseline discount rate values for NPV maximization for the appropriate ownership class and run a BASELINE scenario for purposes of NPV MAXIMIZATION.”</p>	Agree, the sentence has been changed	CLOSED	
3	Methodology refers to NPV maximization of “perpetual” wood products harvests. Methodology should provide guidance on the minimum number of years or rotation cycles considered in the base NPV analysis.	Agree, the text in Section C1 has been changed to indicate a 100 year modeling time frame of perpetual wood harvests.	CLOSED	

C2 Baseline Stratification

	1 st review	Response	2 nd review	Response
1	<p>Long-term average baseline needs to be defined perhaps as 100 years.</p> <p>Consider whether baseline stratification is required or discretion of developer or increase of sample size to achieve precision estimates.</p>	<p>Agree, the text in Section C1 has been changed to indicate a 100 year modeling time frame for baseline</p> <p>Regarding baseline stratification, stratum can be a collection of stands or a single stand, but the process is at the discretion of the project proponent to achieve the precision requirements of the ACR Forest Project Standard. This stratification process selected and the precision targets will also be verified during field verification events over time.</p>	CLOSED	

C3 Baseline Net Reductions and Removals

	1 st review	Response	2 nd review	Response	3 rd review
1	<p>There seem to be a number of cases in which the baseline does not adequately serve to calculate credible net emission reductions.</p> <p>(a) For example, what if with-project stocks are <i>below</i> the longterm average baseline stocks and after year "T"? In this case, which could happen following timber harvest, deltaCbaseline would</p>	<p>In any particular year (t) project stocks may be declining or below the 20-year baseline average (T). While it is possible to have net positive ERTs when below the 20-year baseline the calculations are only positive if the delta in the with-project (or Project t) case is greater than the delta of the without project case (Baseline t) for any</p>	<p>OPEN-see comments at 1(b) in general comments</p>	<p>See our response to 1b below in Appendix 1; see also Addendum 1 to methodology</p>	CLOSED

	1 st review	Response	2 nd review	Response	3 rd review
	<p>be zero, resulting in creditable growth in the project while it's still under the longterm average baseline. Presumably this was not intended, given the text (p8) "increased sequestration through retention of annual forest growth when project activities exceed the baseline", however, current operation of methodology formulae does not prevent this. Also, what happens when with-project change in stocks is negative (e.g. after harvest) after year "T"? ERT's would be negative.</p> <p>(b) On the converse side, since section D5 deals only with increment, , there is uncertainty how the fluctuating stocks are accounting in terms of averages, for example if total amount claimed could be only average during credit period at project end, or how otherwise to account for drops in carbon after peaks. If there are fluctuating stocks in the with-project case, as would be expected where some level of timber harvest continues, the present calculations in the methodology would credit maximum growth achieved (immediately prior to harvest) in the with-project case that exceeds the difference between the with-project long term average and the baseline long term average, and thus is not conservative and ERT's credited would not be stable.</p>	<p>particular year. In other words, the project always has to outperform the baseline over time (both on an annual basis and over the entire crediting period) before ERTs are positive. We have changed the order of the baseline determination section (Section C3) to better reflect situations in which the $\Delta C_{BSL,t}$ will be nonzero (time periods before T). We also added a second graph in the methodology document to illustrate this point (Figure 1a & 1b). And finally we changed section G1 adding both text and equation 24 in an attempt to better demonstrate the inter-temporal working of the ERT allocations</p>		that provides an illustration.	
2	<p>The 20-year period for which the baseline is valid, though consistent with the ACR crediting period, is not consistent with the methodology applicability condition, which requires that the</p>	<p>We do not believe this is an issue. Best management practices or forest certification participation requires updates to landowner management plans as part of</p>	CLOSED		

	1 st review	Response	2 nd review	Response	3 rd review
	forest management plan is updated every 10 years.	normal operations. Updates to these management plans will have to consider carbon commitments as part of their management decisions.			
3	Equations 1, 3 and 6 (and others using the HWP terms) should specify the time interval within which harvests (inputs to wood products) included in accounting the HWP terms occur. Only those occurring in the baseline (20-year) period? More guidance is needed. E.g., in eq. 3: “Twenty-year average value of annual carbon remaining stored in wood products 100 years after harvest (in metric tons CO2).” could also include the accumulated wood products pool with inputs from past harvests prior to project start.	Agree, equation definitions (including Eq3) have been modified to clarify the HWP time interval.	CLOSED		
4	OBSERVATION: Use of 0.5, rather than 0.47 (IPCC 2006GL), as carbon fraction of biomass should be justified.	The carbon fraction listed by the IPCC Good Practice Guidelines continues to be 0.5, see page 11 of IPCC GPG guidelines, Chapter 5 http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf_files/Chp5/Chp5_1_&5_2_Uncertainties.pdf	CLOSED		
5	3.1.2.1, Step 3, sentence 2, should be changed from: “When the bole is in decomposition classes 2, 3 or 4, the biomass estimate must be limited to the main stem of the tree.” To “When the TREE is in decomposition classes 2, 3	Agree, paragraph has been changed.	CLOSED		

	1 st review	Response	2 nd review	Response	3 rd review
	or 4, the biomass estimate must be limited to the main stem of the tree (or bole).”				
6	3.1.2.1 Step 4. Dead wood density class deductions not justified in terms of references, nor in the referenced VCS VM0003. This treatment also conflicts with Step 3 that requires that for standing dead wood classes 2, 3 and 4 biomass estimation is restricted to the bole only (see for example Harmon et al., 2008 http://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs29.pdf).	<p>Agree that the VCS VM0003 does not contain the referenced deductions and we have removed the reference.</p> <p>Agree that that standing dead wood classes 2 and 3 should not be restricted to the bole only. We have adjusted the wording and replaced references with IPCC good practice guidelines (Section 4.3.3.5.3), http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_files/Chp4/Chp4_3_Projects.pdf which contain the dead wood density class deductions (PDF page 17) used in this methodology.</p>	CLOSED		
7	In 3.1.2.2, why is the distance of the LIS transects specified? Should be left open.	Agree, we have added the words “At least” to the transect lengths.	CLOSED		
8	In eq. 9, why is an additional deduction (DWDD) factored in with a dead wood density class specific dead wood density (which already should consider a reduction in density from the base live or sound wood density)? Variable WD already accounts for density.	Agree, we have removed that variable from eq.9.	CLOSED		
9	3.2, Step 1, methodology should specify how, or on what basis, extracted volumes are differentiated among different wood product	Methodology document refers to the 1605b method, which is the forestry appendix of the US DOE publication (reference #23 in the methodology	CLOSED- A reputable reference is cited and the		

	1 st review	Response	2 nd review	Response	3 rd review
	classes.	document). Within the 1605b method, Table 1.6 provides average regional values for wood products and how they are differentiated following harvest. We therefore do not believe it is necessary to describe wood product classes within the methodology document itself	standard and approved methodology do not provide additional guidance. Section 3.2.1 appropriately requires per approved methodology "Calculate the annual biomass of the total volume extracted from within the project boundary with extracted timber volume differentiated..."		
10	Equation (7) uses IPCC Fourth Assessment Report GWP value for methane of 25. This is incorrect – per <i>ACR Standard</i> , methodologies must use the	Agree, references to GWP of methane have been changed from 25 to 21.	CLOSED		

	1 st review	Response	2 nd review	Response	3 rd review
	SAR-100 values (21 for methane, 310 for nitrous oxide). Please correct here, in Equation (14), and anywhere else a GWP parameter appears.				

C4 Monitoring Requirements for Baseline Renewal

	1 st review	Response	2 nd review	Response
1				

C5 Estimation of Baseline Uncertainty

	1 st review	Response	2 nd review	Response
1	Most forest growth and yield models, which are fundamental to the baseline here, lose significant prediction power out past 10 years, and if the uncertainty assumption (C5) that modeled results have the same uncertainty as the input inventory data, 20 years is too long. The calculation of uncertainty based on model results is speculative. In the methodology the authors state “uncertainty for measurement pools” but the significance of this analysis is questioned since measured components will be minor relative to modeling outputs. A 10 year revision of baseline is suggested as an option to address this problem.	Most major forest carbon offset programs require the use of long-term forest carbon forecasting over significant periods of time, however ERTs are only issued if the modeled assumptions can be third party verified which also entails checking assumptions against project –level ground data. Requiring a 10 year revision of the baseline would be incompatible with the ACR Forest Project Standard	CLOSED Although a 10 year baseline revision is not necessarily incompatible with the ACR standard, a 20 year revision currently required aligns most closely. Models are widely required for ex ante baseline projections. Uncertainty is defined for models: “The uncertainty in the baseline scenario should be defined as the square root of the summed errors in each of the measurement pools. For modeled results use the confidence interval of the input inventory data.”	

	1 st review	Response	2 nd review	Response
2	Equation 10 is incorrect. Propagation of errors for an additive total should use error values, not errors expressed as percents. See attached spreadsheet.	Agree. Equation 10 has been changed	CLOSED	

D1 With-Project Stratification

	1 st review	Response	2 nd review	Response
1				

D2 Monitoring Project Implementation

	1 st review	Response	2 nd review	Response
1	OBSERVATION: Last sentence of 4th bullet point has a typo and should end "... FROM the IPCC GPG LULUCF 2003, is recommended."	Noted, 4 th bullet has been corrected	CLOSED	

D3 Monitoring of Carbon Stocks in Selected Pools

	1 st review	Response	2 nd review	Response
1	OBSERVATION: First par, 3 rd sentence has a typo and should end "... FROM the IPCC GPG LULUCF 2003, is recommended."	Noted, 3rd sentence has been corrected	CLOSED	

D4 Monitoring of Emission Sources

	1 st review	Response	2 nd review	Response
1	What is the justification for eliminating	Per the 1605b forestry	CLOSED- Conservative	

	1 st review	Response	2 nd review	Response
	emissions from harvesting activities? Could the authors cite sources in this regard such as Markewitz, 2006. This emission source could be conservatively excluded if the logging operation is the same between activity and baseline treatments but should be explicit.	publication (Table 1.6) & referenced for use in this methodology-- the only carbon that remains out of the atmosphere following timber harvest activity is that fraction of wood product that remains in use after 100 years. All other material in the harvest unit is considered an emission. This assumption is what is used in both the baseline and project forecasts. As such, we are not excluding the emissions associated with harvesting activities.	exclusion can be assumed based on less intensive logging operation activities in project activity scenario.	

D5 Estimation of Project Emission Reductions or Enhanced Removals

	1 st review	Response	2 nd review	Response
1	Eq 14 appears to assume 100% oxidation of logging slash stocks burned, which is not conservative in the baseline, or potentially overestimates baseline.	We believe it is reasonable given that the project proponent has to estimate the fraction of biomass burned (not assume all of it is 100% consumed) in the baseline (see variable BSp,t). These assumptions are then third-party verified during verification events.	CLOSED	

D6 Monitoring of Activity Shifting Leakage

	1st review	Response	2nd review	Response	3rd review
1	<p>D6 first paragraph state:</p> <p>“If leakage from activity shifting is discovered, Project Proponents must estimate the associated leakage amount and deduct ERTs to fully compensate for emissions resulting from activity shifting leakage.”</p> <p>If activity shifting leakage is discovered and exceeds <i>de minimis</i>, the methodology by definition is no longer applicable. This sentence should be deleted, or the applicability condition removed and guidance expanded to treat leakage from activity shifting.</p>	<p>Reference to activity shifting leakage as part of the applicability conditions has been removed.</p>	<p>OPEN Although the text is copied accurately from an approved ACR methodology, the reviewers believe this text inclusion is an error. This sentence regarding deduction of ERTs must be deleted as the methodology does not apply per eligibility requirements if activity shifting is discovered on lands owned or under management control of timber rights owners and cannot be made applicable with activity shifting leakage accounting. Other types of activity shifting leakage outside of timber rights owners are undefined in this methodology.</p>	<p>Per the first review, we removed the sentence on activity shifting leakage and it is no longer part of applicability conditions (Section A2). However, there was a mis-statement in D6 referring to “applicability conditions” which has been removed.</p> <p>To address reviewer concerns about activity shifting leakage outside of timber rights owners, we have added a applicability condition to A2, requiring landowners to</p>	<p>CLOSED</p>

	1 st review	Response	2 nd review	Response	3 rd review
				have owned their land for at least 12 months prior to the project start date.	
2	OBSERVATION: "Activity" in title of section D6 is misspelled.	Noted, the spelling of activity has been corrected.	CLOSED		

D7 Estimation of Emissions Due to Market Leakage

	1 st review	Response	2 nd review	Response	3 rd review
1	Assumption that harvesting is displaced to similar forest types is untenable (and would pre-assume that LK term is virtually always 0.4). Determining reliably area for displacement may not be viable operationally.	Noted. The 0.4 Leakage term is assigned only in cases where the percentage of harvest in the project scenario is different from the baseline harvest amounts by more than 25%. If it is less than that, then there is a different leakage value. We therefore believe that the LK term will not virtually always be 0.4.	OPEN Again the text is copied accurately from an approved ACR methodology, but the reviewers believe this text inclusion is an error. An accurate determination of displacement of forest products in the global marketplace is not feasible. A consistent default value should be used for all market leakage cases where project wood products are 25+% below baseline projections.	Agree. Default values have been added to Section D7. A single default deduction of 0.4 is used when wood products production decreases more than 25%.	CLOSED

D8 Estimation of With-Project Uncertainty

	1 st review	Response	2 nd review	Response
1	Equation 21 is incorrect. Propagation of errors for an additive total should use error values, not errors expressed as percents. See attached spreadsheet.	Noted, Equation 21 has been corrected	CLOSED	

E1 Ex-Ante Estimation Methods

	1 st review	Response	2 nd review	Response
1				

F1 Methods for Quality Assurance

	1 st review	Response	2 nd review	Response
1				

F2 Methods for Quality Control

	1 st review	Response	2 nd review	Response
1				

F3 Calculation of Total Project Uncertainty

	1 st review	Response	2 nd review	Response
1	Equation 22 is incorrect. Propagation of errors for an additive total should use error values, not errors expressed as percents. See attached spreadsheet.	Noted, Equation 22 has been corrected	CLOSED	

G1 Calculation of ERTs

	1st review	Response	2nd review	Response
1	See comments related to baseline C1.	ERT formula has been modified	CLOSED	

Appendix 1: Response to reviewer's comments 1a and 1b

Response to comment 1a

Regarding reviewers comment 1(a) we agree that a re-evaluation of project baseline on a regular interval is warranted. However, we disagree that our methodology should specify a time line, procedure or citations related to baseline evaluation for the reasons stated below. We believe this is a policy issue rather than a technical issue to be addressed by ACR.

- 1) Existing ACR policy requires a project proponent to apply for crediting renewal every 20 years (see Chapter 8, Section D of the ACR *Forest Carbon Project Standard*), which include "re-evaluating the project baseline". ACR therefore has the authority and responsibility to develop a specific process and criteria to guide review and approval of such renewal applications.
- 2) There are two existing approved ACR IFM methodologies (that use NPV) which reference ACR's policy on this very issue.

Therefore, we believe the current requirements for application renewal (at the end of the first crediting period) is the appropriate time frame for a review of NPV and other baseline variables. At the end of 20 years, ACR will make a determination and decide if a change is warranted. We recommend that ACR form a workgroup with project developers to discuss and develop what the process and criteria should be for approving renewal to the next crediting period.

In addition, we have communicated to ACR that our discount rates are conservative based on existing available published literature, market assessments, and from our discussions with experienced natural resource professionals. As the Brookfield (2010) report indicates, NPV rates as high as 7.5% were reported for Private Industrial ownerships. Setting baseline discount rates of 6% is conservative by comparison.

A change in discount rates would only be a concern if discount baseline rates decline (going from say 6% to 5%), which in our estimate is unlikely to occur. The discount rates selected for use in our methodology are already on the lower end of the spectrum, and thus conservative. We believe that there is significantly greater likelihood that over time discount rates will rise rather than decline. We have been in an extended period of very low inflation and discount rates currently being used are low. In times of economic uncertainty and possible increases in inflation, discount rates are much more likely to increase (not decrease) over time.

Higher discount rates reflect greater pressure for investment returns (i.e. shorter rotations, more frequent harvests) which has the effect of lowering baseline stocks. By contrast, lower discount rates reflect less pressure for economic returns (i.e. longer rotations, less harvest pressure) and higher baseline stocks. If the baseline discount rate is raised at the end of the first Crediting Period (20 years), it would have the impact of a less conservative baseline compared to the one at project initiation. Keeping the discount rate constant from the date of initiation is therefore the more conservative approach, because it will result in less ERTs over time. Keeping the NPV values constant is consistent with ISO 14064-2 principle of conservativeness and the *ACR Standard*.

Response to comment 1b

Regarding reviewers comment 1(b), we have developed a spreadsheet (see Addendum 1 in the methodology document) that shows how the calculations function in cases where project stocks drop below the baseline. It demonstrates that the equations are set to prevent issuance of ERTs in cases where project stocks drop below the baseline. This type of situation is of particular importance to small family ownerships (<100 acres). It is less of a concern for industrial ownerships which have less chance of dropping below baseline because they have more forestlands with more regulated conditions and harvest plans. As the spreadsheet demonstrates, while it is possible that projects stocks can drop below the baseline, that action does not result in ERTs being issued to the project. In addition, we have added a citation under Section C1 for the 6% discount rate value for Private Industrial ownerships.