



THE RAINFOREST STANDARD

Integrating social, environmental and economic well-being

EMISSION REDUCTIONS

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Integrating Social, Environmental, and Economic Well-being

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THE RAINFOREST STANDARD

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STRUCTURE: REQUIREMENTS AND PROTOCOLS

[Methodologies]

The Rainforest Standard consists of *Requirements* and protocols organized into five subject Sections: *Initial Conditions* (IC1-3) requiring a description of the natural, social, and legal status of the project area at the outset; Socio-cultural and Socio-economic requirements (S1-3), biodiversity considerations (B1-7), emission reduction considerations (ER1-5), and administrative operations (A1-8). A Glossary follows the five subject sections. Exhibits, Schedules, Templates, and an Appendix (*RFS Interactive Permanence Tool* link) follow the Glossary.

Initial Conditions	Socio-Cultural Socio-Economic	Biodiversity	Emission Reductions	Administration	Glossary
IC1: <i>Project Area Initial Conditions</i>	S1: Identifying and respecting de facto rightsholders	B1-1 to B1-3: Benchmarks	ER1: <i>Project Additionality</i>	A1: <i>RFS Website and Project Webpage</i>	Exhibits
				A2: <i>Experts, Representative Organizations, Commentators and Referees</i>	Schedules
IC2: <i>Project Participants</i>	S2: Transparency	B1-4 to B1-6 Monitoring, Reporting, Verification	ER2: <i>Emission Reduction Additionality and Baselines</i>	A3: <i>Project Validation</i>	Templates
				A4: <i>Monitoring, Reporting, Verifying</i>	Appendix
IC3: <i>Legal Foundation</i>	S3: Sustainable Quality of Life Benefits	B1-7: Data	ER3: CO ₂ e Emission Reduction Calculations	A5: <i>Crediting Period, Project Life, Permanence Period</i>	
				A6: <i>Credit Registration, Transfer, Retirement</i>	
			ER4: <i>Leakage</i>	A7: <i>Defaults and Remedies</i>	
			ER5: <i>Permanence</i>	A8: <i>Fees</i> A9: <i>Miscellaneous</i>	

THE RAINFOREST STANDARD

Integrating Social, Environmental, and Economic Well-being

EMISSION REDUCTIONS

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ER1: PROJECT ADDITIONALITY

OBJECTIVES:

There is a broad consensus among governments (e.g., UNFCCC; *IPCC*; Kyoto Protocol), NGOs (e.g., EDF; WRI), and standards (e.g., CAR; VCS) that *Projects* should not be able to claim carbon offset credits unless they demonstrate that their carbon emission reductions exceed what would have occurred in the absence of the *Project*. In the language of carbon credits, emission reductions must be “*Additional*” to “business-as-usual” scenarios.

There are two ways of thinking about *Additionality*: First - Is the *Project Additional*? Second - Are the *Project’s* emission reductions *Additional*? The *RFS* requires that *Project Proponents* demonstrate both modes of *Additionality*. The first type of *Additionality*, *Project Additionality*, is described in this Section, ER1. The second type of *Additionality*, *Emission Reduction Additionality*, is described in Section ER2.

RATIONALE:

Additionality is one of the more complex and controversial elements in the debate surrounding carbon offsets. One reason is the two very different perspectives on using CO₂e reduced emission credits as offsets. Those whose primary concern is conserving forests may not see *Additionality* as a critical issue: many think all tropical forests are vulnerable to removal, and thus conserving any tropical forest is additional. On the other hand, those whose primary concern is climate change do not believe fossil fuel users in developed countries should be allowed to increase their emissions by applying credits from *Projects* or nations where they believe there is not convincing evidence that forests will be removed and thus emissions effectively reduced. The *RFS Project Requirements* are designed to satisfy both the concerns of those focused on climate

change and those whose primary concern is forest conservation. This means that *Additionality* has to address both issues rigorously.

The *RFS* uses widely accepted tests in its three-pronged determination of *Project Additionality*: a *Legal Additionality Test*, an *Economic Incentive Test*, and an *Existing Incentives Test*. In general, a “strict” *Legal Additionality Test* states that if there is a law, regulation, or contractual obligation that prohibits *Tree Biomass* removals in the *Project Area* the *Project* is not additional, regardless of the extent to which the prohibition has been enforced. *The RFS* endorses the strict *Legal Additionality Test*, but allows one exception under very limited circumstances: i.e. where there is a history of recent and repeated *Tree Biomass* removals inside a *Protected Area*.

Limiting evidence of removals to those that have occurred inside a *Protected Area* eliminates consideration of threats from external *Drivers Of Deforestation* such as highway construction or expanding farming and ranching activity. In the view of *The RFS*, outside threats should not be considered because the law has already recognized those threats when prohibiting removals inside the *Protected Area*. In other words, external threats to a *Protected Area* cannot trigger a finding of *Additionality*; instead there must be evidence that the *Protected Area* is experiencing recent and repeated *Tree Biomass* removals despite its legal protection, i.e., there is clear evidence of ineffective enforcement in the *Protected Area*. *The RFS* recognizes that there may also be examples of ineffective enforcement of laws against removing *Tree Biomass* outside of *Protected Areas*; however, the extent to which any *Project Proponent* is complicit or compliant with respect to illegal removals is presently deemed too difficult to determine. *The RFS* makes the presumption that the *Governmental Authority* managing a *Protected Area* would not be so complicit or compliant. Therefore, *The RFS* retains strict legal *Additionality* for all *Project Areas* other than *Protected Areas*.

In addition to the *Legal Additionality Test*, *The RFS* requires the application of the *Economic Incentive Test*. The *Economic Incentive Test* requires showing that removals of *Tree Biomass* provide a net economic benefit to either the removers or the *Forest Users* or *Rightsholders*. Net economic benefit to removers exists when their cost of removal is exceeded by the economic benefits derived from what is removed (e.g. logging). Net economic benefit to *Forest Users* or *Rightsholders* exists when lands are more valuable if *Tree Biomass* is removed (e.g. for farming or ranching). Net economic benefits can occur in one of these situations and not the other. Either satisfies the *Economic Incentive Test*.

Thirdly and finally, an *Existing Incentives Test* is applied. *Projects* will not be validated or verified while receiving any form of crediting or payments for reducing their *Tree Biomass* removals from sources other than *RFS Credits*; and once a *Project* is validated, credits will not be verified if the *Project* is concurrently the source of such credits or payments.

In essence, *The RFS* concludes that a *Project* is additional when (1) removing its *Tree Biomass* does not violate any law, regulation, or contractual obligation; (2) there is an economic incentive for actors to remove its *Tree Biomass*; and (3) the *Project* is not already receiving credits or payments for reducing the removal of its *Tree Biomass*.¹

¹ The Barrier and Common Practice Tests have not been adopted by *The RFS*. When the only project activity required is to not to remove *Tree Biomass*, a Barrier Test (e.g., demonstrating an impediment to not cutting down trees other than a legal prohibition or lack of economic incentive) does not appear to add anything substantive to the Legal Additionality and Economic Incentive Tests adopted by *The RFS*. The Common Practice Test (if the project type is “common” for similar projects it is not additional) is complex, difficult to bring to closure, and therefore extremely time-consuming and costly; and may ultimately be self-defeating. If legal and economically incentivized removals of *Tree Biomass* are reduced or eliminated by the implementation of *The RFS* and other crediting systems, and, as we hope, these reductions become widespread, their success should not be deemed a reason to find other projects non-additional and to terminate them or prohibit other projects from participating in the system if they meet the other Additionality tests.

Notably, *The RFS* does not require *Project Additionality* to be re-examined after its initial *Project* validation. Once a *Project Proponent* demonstrates its *Project* is additional under *The RFS* the *Project* is deemed additional for the duration of the *Project Period*. The risk of having a *Project* initially designated as additional losing that designation during the *Project Period* could both discourage initial *Project* development and promote impermanence following a declaration of non-*Additionality* leading to *Voluntary Reversals*. If *Projects* could be “de-validated”, *Project Proponents* such as *Indigenous Peoples*, local communities, governments supporting *Protected Areas*, and private landowners seeking to preserve *Eligible Forested Lands* for generations would be at risk that their long-term planning goals could be cut short even though they were fulfilling their obligations, often after having sacrificed short-term economic gains to do so.

REQUIREMENTS:

ER1-1 Legal Additionality Test.

A. To establish *Legal Additionality*, the *Project Proponent* shall submit with its *Initial Project Submission Documents* the following:

1. A *Personal Representation* by the *Project Proponent’s* and the *Project Developer’s* top executive officer (e.g., CEO, Principal Partner, Executive Director) in his or her personal capacity as well as by the *Project Proponent* and *Project Developer* stating that to the best of his/her knowledge and belief after a full, good faith investigation (see Template: *Representations*):

- a. There are no laws or regulations prohibiting or limiting removal of *Tree Biomass* in the *Project Area*, except as specifically stated on Schedule ER1-1_A; and
- b. There are no contracts or agreements pertaining to the *Project Area* and any *Project Participant* related to removal of

Tree Biomass in the *Project Area*, except as specifically stated on Schedule ER1-1_ B; and

c. The information set forth in the *Legal Opinion* in ER1-1-A2 below is accurate and complete in all material respects.

2. A *Legal Opinion* setting forth:

a. All laws and regulations in the jurisdictions in which the *Project Area* is located that relate to removal of *Tree Biomass*, including those related to such parameters as species, size, condition, the number that might be removed, any time periods specified, the administrative procedures for any required permits, and any other information pertaining to whether there is a legal or regulatory prohibition or constraint on *Tree Biomass* removals; and

b. All contracts or agreements pertaining to the *Project Area* and any *Project Participant* related to *Tree Biomass* removal; and

c. Whether the *Project* or any *Project Participant* has received, is receiving, or has entered into any agreement or understanding, written or oral, that gives the *Project Participant* a reasonable expectation of receiving any remuneration for reducing removals of *Tree Biomass* other than submission of the *Project* for *RFS Crediting*.

B. All portions of the *Project Area* covered by laws, regulations or agreements that prohibit *Tree Biomass* removal entirely have been defined as *Ineligible Forested Lands* to ensure that *Tree Biomass* removals in such areas are not creditable.

C. All portions of the *Project Area* where *Tree Biomass* removal is not entirely prohibited by law, regulation, or agreement shall be deemed *Additional* with

respect to the *Legal Additionality Test* and are defined as *Eligible Forested Land*.

D. The *Protected Area Exception* to the strict *Legal Additionality Test*: Reduced removals of *Tree Biomass* have *Additionality* in *Protected Areas* if official reports prepared by a *Governmental Authority* confirm that all three of the following conditions are met:

1. Illegal removals have occurred inside the *Protected Area* during the *Protected Area Illegal Removal Period* defined as a period starting (a) after the *Protected Area* was constituted, and (b) not more than ten (10) years prior to the *Initial Project Submission Date*. For purposes of clarity:

Table ER1-D: Illustration of Protected Area Illegal Removal Periods		
<i>Initial Project Submission Date</i>	<i>Protected Area creation date</i>	<i>Protected Area Illegal Removal Period</i>
January 2013	January 1998	Jan 2003-Dec 2012
January 2013	January 2003	Jan 2003-Dec 2012
January 2013	January 2008	Jan 2008-Dec 2012

2. Illegal removals have occurred within 3 years prior to the *Initial Document Submission Date*.
3. Illegal removals have occurred at least once every 3 years during the *Protected Area Illegal Removal Period*.

ER1-2 Economic Incentive Test.

A. To establish that removals of *Tree Biomass* provide a net economic benefit to either those engaging in illegal removals or a *Project Participant*, the *Project Proponent* shall provide the following with its *Initial Project Submission Documents*:

1. A written valuation report (*Forestry Valuation Report*) by a *Proponent Land Use Expert* stating that the cost of illegal removals of *Tree Biomass* (e.g. logging) is exceeded by the economic benefits derived from that which is removed; or that lands used or owned by the *Project Proponent* or *Project Participants* are more valuable without forest than with forest (e.g. for farming or ranching). The *Forestry Valuation Report* shall provide an analysis of costs and benefits in monetary terms, and shall cite published evidence in support of its analysis.

2. A *Personal Representation* by the *Project Proponent's* and the *Project Developer's* top executive officer (e.g., CEO, Principal Partner, Executive Director) in his or her personal capacity as well as by the *Project Proponent* and *Project Developer* stating that to the best of his/her knowledge and belief after a full, good faith investigation the *Forest Valuation Report* is complete and accurate.

3. A *Representation* by the *Proponent Land Use Expert* stating that to the best of his/her/its knowledge and belief after a full, good faith investigation the *Forest Valuation Report* is complete and accurate.

B. The *Forestry Valuation* shall be reviewed in accordance with the *Public Commentary*, review, and *Referee* procedures described in Section A2.

ER1-3 Existing Incentives Test.

A. To establish that the proposed *Project* is not receiving any form of crediting or payments for reducing its *Tree Biomass* removals other than from *The RFS Project*, the *Project Proponent* shall submit the following with its *Initial Project Submission Documents*:

1. A *Personal Representation* by the *Project Proponent's* and the *Project Developer's* top executive officer (e.g., CEO, Principal Partner, Executive Director) in his or her personal capacity as well as by the *Project*

Proponent and *Project Developer* stating that to the best of his/her knowledge and belief after a full, good faith investigation (see Template: *Representations*):

- a. The history of any form of Non-*Project* crediting or payments for reducing its *Tree Biomass* removals for three years immediately preceding its *Initial Project Submission Documents*; and
- b. At the time of submission of its *Initial* and *Final Project Submission Documents*, the *Project* is not receiving any form of crediting or payments for reducing its *Tree Biomass* removals, except as specifically stated on Schedule ER1-1_A; and
- c. There are no contracts or agreements pertaining to the *Project* or any *Project Participant* related to any form of crediting or payments for reducing its removal of *Tree Biomass* in the *Project Area*, except as specifically stated on Schedule ER1-1_B; and
- d. Whether the *Project Proponent* or *Project Developer* has filed a tax return within the three years immediately preceding the submission of the *Initial Project Submission Documents*, or had a financial statement prepared, and if it has done so, identifying the *Tax Preparer* or *Financial Statement Preparer*.

2. In the event the *Project Proponent* or the *Project Developer* has filed a tax return within the three years immediately preceding the submission of the *Initial Project Submission Documents*, or had a financial statement prepared, all such *Tax Preparer* or *Financial Statement Preparers* shall provide a statement that to the best of their knowledge and belief after a full, good faith investigation (see Template: *Representations*):

- a. The history of any form of Non-*Project* crediting or payments for reducing its *Tree Biomass* removals for three years immediately preceding its *Initial Project Submission Documents*; and
- b. At the time of submission of the *Initial* and *Final Project Submission Documents*, the *Project* is not receiving any form of crediting or payments for reducing its *Tree Biomass* removals, except as specifically stated on Schedule ER1-1_A; and
- c. There are no contracts or agreements pertaining to the *Project* or any *Project Participant* related to any form of crediting or payments for reducing its removal of *Tree Biomass* in the *Project Area*, except as specifically stated on Schedule ER1-1_B.

B. Once a *Project* is validated credits cannot be verified if the *Project* is concurrently the source of credits or payments for reduced *Tree Biomass* removal other than through *RFS Credits*. In the event such a validation or verification were to be made erroneously, credits issued would be treated as erroneously issued and reimbursed using the same method as if a *Voluntary Reversal* had occurred (see ER-4).

ER2: PROJECT EMISSION BASELINES and EMISSION REDUCTION ADDITIONALITY**OBJECTIVES:**

As noted in ER1, there are two ways of thinking about *Additionality*: 1 - Is the *Project Additional*? 2 - Are the *Project's* emission reductions *Additional*? To conclude that a *Project's* emission reductions are *Additional*, those emission reductions must exceed those that were expected based on a “business-as-usual” scenario.

The objective of Section ER2 is to establish protocols for identifying business-as-usual scenarios for emissions, termed *Project Emission Baselines*. *Project Emission Baselines* can then be compared to observed emissions to determine whether emissions during a *Crediting Period* have been reduced relative to the *Project Emission Baseline*. If emissions have been reduced, they are *Additional*, and give rise to *RFS Credits* (see ER3 for *RFS Credit* calculation protocol).

RATIONALE:

At first glance establishing whether reductions in *Tree Biomass* removals are *Additional* seems simple and straightforward: Is less carbon emitted from the *Project Area* than would have been had the *Project* not been undertaken? However, for at least two reasons this determination is not straightforward: (1) it involves demonstrating a “counterfactual” – what would have happened in the *Project Area* in the absence of the *Project*; and (2) it involves predicting the future interaction of numerous and diverse variables (e.g., market prices; regulatory regimes; road-building; population density) that are not under a single entity's control and are subject to large fluctuations and other uncertainties.

Two of the most widely applied solutions to this problem are (a) the “historical” approach, and (b) the “blended” approach combining historical data with data related to *Drivers Of Deforestation*. Both approaches have their advocates and both approaches have had intermittent success in predicting some short-term future changes. However, at the date of **The Rainforest Standard** Version 2.0, neither approach has demonstrated widespread and consistent validity.

With these limitations in mind, *The RFS* has taken the position that it will accept as valid projected baseline emissions (a) documented evidence of the intention, capacity, and authority to remove *Tree Biomass* in the *Project Area* (“*Documented Prospective Removals*”); (b) a *Governmental Removal Baseline*, validated in accordance with *The RFS* criteria described in ER2-2A below, or (c) a *Validated Removals Baseline*, validated in accordance with *The RFS* criteria described in ER2-2A below.

REQUIREMENTS:

ER2-1 The term *Documented Prospective Removals* refers to proposed activities that have documented evidence of intent, capacity, and authority to remove *Tree Biomass* in the *Project Area*.

A. If a *Project* chooses to use a *Documented Prospective Removals Baseline*, the *Project Proponent* shall provide the following in its *Initial Project Submission Documents*:

1. a *Documented Prospective Removals Justification* consisting of one of the following:
 - a. Permit issued by a *Governmental Authority* for the removal of *Tree Biomass*;
 - b. Plans for development authorized by a *Governmental Authority*;
 - c. Private development plans authorized by a *Governmental Authority*;

- d. Logging concessions or other extractive concessions or activities authorized by *Governmental Authorities*;
- e. sustainable forestry harvest management program pursuant to binding plan or agreement;
- f. community forestry harvest practices pursuant to a *Life Plan* or *Community Document*;
- g. other documented forest harvest practices pursuant to enforceable contractual obligations; or
- h. other activities that have documented evidence of intent, capacity, and authority to remove *Tree Biomass* including:

- (1) permits, if required, and

- (2) either:

- (a) an enforceable arm's length contract for work to remove *Tree Biomass*, or

- (b) an enforceable contract for the sale of *Tree Biomass* from the prospective removal, or

- (c) a contract on a property contiguous with the *Project Area* for work to remove *Tree Biomass* or for the sale of *Tree Biomass*.

2. A *Documented Prospective Removals Map* demarcating the area of the prospective *Tree Biomass* removals superimposed on the *Benchmark Eligible Forested Land Map* in accordance with the *Requirements* of IC1.

3. A *Documented Prospective Removals Timeline* of the times for all prospective *Tree Biomass* removals; such timetable shall be confirmed by and consistent with all *Documented Prospective Removals Justifications*.

B. In addition to the documentation required by ER2-1A, the *Project Proponent* shall provide the following:

1. A *Personal Representation* by the *Project Proponent's* and the *Project Developer's* top executive officer (e.g., CEO, Principal Partner, Executive Director) in his or her personal capacity as well as by the *Project Proponent* and *Project Developer* stating that to the best of his/her knowledge and belief after a full, good faith investigation (see Template: *Representations*) the *Documented Prospective Removals Justification*, *Documented Prospective Removals Map*, and *Documented Prospective Removals Timeline* are accurate and complete in all material respects; and,

2. either:

- a. a *Legal Opinion* confirming the validity and accuracy of the *Documented Prospective Removals Justification*, *Documented Prospective Removals Map*, and *Documented Prospective Removals Timeline*; or

- b. an official document of the *Governmental Authority* confirming the *Documented Prospective Removals Justification*, *Documented Prospective Removals Map*, and *Documented Prospective Removals Timeline*.

ER2-2 Alternate Removal Baselines

For *Projects* that cannot use the *Documented Prospective Removals Baseline*, the expected reduction in *Tree Biomass* carbon stock in the *Project Area* in the absence of the *Project* can be established using a *Governmental Removals Baseline* or, if no *Governmental Removals Baseline* is available, a *Validated Removals Baseline*.

A *Governmental Removal Baseline* is a baseline model published by a duly authorized governmental unit encompassing the entire *Project Area* (as shown on the *Project*

Boundary Map). If, and only if, no *Governmental Removals Baseline* exists, *The RFS* will accept any other baseline that complies with all *Conditions For Acceptability - Baselines* (“*Validated Removals Baseline*”).

A. If a *Project* chooses to use either a *Governmental Removal Baseline* or a *Validated Removals Baseline*, the *Project Proponent* shall provide in its *Initial Project Submission Documents* an *Alternate Baseline Methodology Report* prepared by its *Proponent Baseline Expert*.

1. If the *Alternate Baseline Methodology Report* opts to use a *Governmental Removal Baseline*, the report must establish the following:

- a. the *Governmental Removal Baseline* was produced in accordance with subparagraphs 1 and 4 of *The RFS Conditions For Acceptability-Baselines* described in ER2-2C describing the specific ways in which it complied with the *Requirements* of each subparagraph; and
- b. whether there is more than one *Governmental Removal Baseline* covering the *Project Area*; and
- c. if there is more than one applicable *Governmental Removal Baseline*, a composite *Governmental Removal Baseline* has been calculated by multiplying each *Governmental Removal Baseline* by the proportion of the *Project Area* to which it applies, and then summing the results. For example, if one *Governmental Removal Baseline* is 2% in 50% of the *Project Area* and one *Governmental Removal Baseline* is 1% in 50% of the *Project Area*, the composite *Governmental Removal Baseline* is 1.5%.

2. If the *Alternate Baseline Methodology Report* opts to use a *Validated Removals Baseline*, the report must establish the following:

- a. no *Governmental Removal Baseline* is available;

b. the *Validated Removals Baseline* was produced in accordance with all subparagraphs 1, 2, 3, and 4 of *The RFS Conditions For Acceptability-Baselines* described in ER2-2C, describing the specific ways in which it complies with the *Requirements* of each subparagraph.

B. The *Alternate Baseline Methodology Report* shall be subject to an *Automatic Review (A2-4)* by an *Assigned Baseline Expert* but the A2-4 timelines shall be modified as follows:

1. If prior to the issuance of its findings, the *Assigned Baseline Expert* requests clarifications, the *Proponent Baseline Expert* shall provide them within 30 days of the request.
2. The *Assigned Baseline Expert* shall issue its findings within 30 days of receiving any requested clarifications. If the *Assigned Baseline Expert* finds that the methodology is not in compliance with the *Requirements* of ER2-2, the findings will specify the deficiency. The *Proponent Baseline Expert* may file a revised *Alternate Baseline Methodology Report* within 60 days of receiving the initial findings. If the *Assigned Baseline Expert* finds that the revision is in compliance with the *Requirements* of ER2-2, the baseline will be deemed accepted. If the *Assigned Baseline Expert* finds that the revision is in not in compliance with the *Requirements* of ER2-2, the baseline will be deemed rejected.

C. The *RFS Conditions For Acceptability - Baselines* are:

1. historical data alone are not sufficient - site specific *Drivers Of Deforestation* must be addressed; and

2. any modeling approach must have been published in *Peer-reviewed Literature* and found to be valid; and
3. site-specific *Drivers Of Deforestation* (including those to be entered into a validated model) are assessed with a methodology that has been published in *Peer-reviewed Literature* and found to be valid with respect to those drivers that are acting on the *Project Area* within three years prior to the *Initial Project Submission*, as confirmed by an *Proponent Baseline Expert*; and
4. *Project Emission Baselines* rates must be expressed as annual rates.

D. In addition to the documentation required by ER2-2A, the *Project Proponent* shall provide a *Personal Representation* by the *Project Proponent's* and the *Project Developer's* top executive officer (e.g., CEO, Principal Partner, Executive Director) in his or her personal capacity as well as by the *Project Proponent* and *Project Developer* stating that to the best of his/her knowledge and belief after a full, good faith investigation (see Template: *Representations*) the proposed removals baseline model is accurate.

ER3: CO₂e EMISSION REDUCTION CALCULATIONS**OBJECTIVE:**

To calculate a *Project's* reduced CO₂e emissions resulting from lower levels of *Tree Biomass* removals (*Project Emission Change*) by comparing observed *Tree Biomass* carbon stocks to carbon stocks expected without the *Project* during a *Crediting Period*.

RATIONALE:

The *RFS* provides a 10-step protocol for calculating an estimate of *Project Emission Change*. One important goal of the protocol is to maximize the ability to capture small-scale removals of *Tree Biomass*, often referred to as “degradation”. This is accomplished without defining deforestation or degradation, since attempts to precisely define deforestation can open the door to an inability to account for small to moderate but significant removals widely referred to as degradation.

The RFS does not measure change in carbon stocks arising from growth or removal of biomass planted by people. Thus, afforestation and reforestation are not creditable under *The RFS*. Defining *Tree Biomass* to refer only to natural forests and to exclude biomass growth from human plantings, advances two central *RFS* goals: the protection of natural-growth forests and their biodiversity; and incentivizing sustainable long-term *Forest Dweller* livelihoods because planting and harvesting cycle activities will not affect carbon stock change and crediting calculations as they would if removals of planted material were considered *Tree Biomass* removals.

The following briefly summarizes the protocol.

Step 1: Calculate the *Carbon Stock Benchmark*.

Step 2: Calculate *Expected Carbon Stock Change* for a *Crediting Period*.

- Step 3: Calculate *Observed Carbon Stock Change* for a *Crediting Period*.
- Step 4: Compare *Expected to Observed Carbon Stock Change* to calculate *Gross Carbon Emission Change*.
- Step 5: Deduct *Leakage* using method described in ER4 from *Gross Carbon Emission Change* to arrive at *Aboveground Carbon Emission Change*.
- Step 6: Multiply *Aboveground Carbon Emission Change* by 20% (or other empirically established percentage) to arrive at *Belowground Carbon Emission Change*.
- Step 7: Multiply *Aboveground Carbon Emission Change* by 10% (or other empirically established percentage) to arrive at *Deadwood Carbon Emission Change*.
- Step 8: Sum *Aboveground Carbon Emission Change*, *Belowground Carbon Emission Change*, and *Deadwood Carbon Emission Change* to arrive at *Net Carbon Emission Change*.
- Step 9: Multiply *Net Carbon Emission Change* by 3.67 to arrive at *Project Emission Change* for the *Crediting Period*.
- Step 10: *Five-Year Adjustment Calculation*

RFS Credits and *RFS Debits* are issued for each *Crediting Period*: if *Project Emission Changes* are negative, credits are issued; if *Project Emission Changes* are positive, debits are issued (see ER3-2).

REQUIREMENTS:

ER3-1 The following steps describe the procedure for calculating *Project Emission Change*.

A. Step 1: Estimating the *Carbon Stock Benchmark*:

As part of its *Final Project Submission Document*, the *Project Proponent* shall submit its calculation of the *Carbon Stock Benchmark* in the *Project Area's Eligible Forested Land* in accordance with the following methods:

1. General Requirements.

a. To calculate the *Carbon Stock Benchmark*, the *Proponent Carbon Stock Expert* shall refer to the *Benchmark Eligible Forested Lands Map* (IC1-4) and the accompanying *Forest Type*Condition Stratification Matrix* (IC1-4F).

b. The *Carbon Stock Benchmark* is deemed to be the estimate of Carbon (C) in the *Project Area* as of the *Project Start Date* provided its supporting data were not collected more than 270 days prior to the *Project Start Date*. If the supporting data were collected more than 270 days prior to the *Project Start Date* they are deemed “stale” and must be updated so that they are not older than 270 days prior to the *Project Start Date*.

2. The *Proponent Carbon Stock Expert* shall follow the following procedure to estimate the *Carbon Stock Benchmark*:

a Sampling design. Using the *Forest Type*Condition Stratification Matrix*, the layout and number of plots needed to achieve 90% accuracy shall be determined by using established methods and guidelines for determining the number, size, and distribution of sample plots described in Section 6.5 in Pearson et al. 2005.

b. If a duly authorized *Governmental Authority* has sanctioned particular allometric equations those shall be applied.

c. If no allometric equations have been sanctioned by a duly authorized *Governmental Authority*, generalized allometric equations shall be applied in accordance with *Peer-reviewed Literature*.²

² Developing site-specific, species-specific allometric relationships is time-consuming and expensive because it requires destructive harvesting of a large number of trees. Tropical forests often contain 300 or more species, but research has shown that species-specific allometric relationships are not needed to generate reliable estimates

d. *Carbon Stock Benchmark: Aboveground Tree Biomass* carbon stocks are estimated using the statistically sampled ground-based data. Allometric relationships are first applied to the ground-based forest measurements to estimate the average carbon stock per hectare in each *Forest Type* in each *Forest Condition* (C/ha). To estimate the *Carbon Stock Benchmark*, multiply the average carbon stock per *Forest Type* by *Forest Condition* by the total number of hectares per *Forest Type* by *Forest Condition* and sum the results across all cells.

B. Step 2: In the *Final Project Submission Documents*, calculate the *Expected Carbon Stock Change* for a given *Crediting Period* using the selected baseline (*Documented Prospective Conversion Baseline*; *Governmental Removal Baseline*; or *Validated Removal Baseline*).

1. The general formula for estimating *Expected Carbon Stock Change* for a given *Crediting Period* is:

$$\Delta E(cp) = cp * R * (C_1 * FL_1 + C_2 * EFL_2 \dots C_n * EFL_n)$$

$\Delta E(cp)$ = *Expected Carbon Stock Change* in period *Cp*

cp = *Crediting Period* in years (to nearest hundredth).

of forest carbon stocks. Grouping all species together and using generalized allometric relationships, stratified by broad forest types or ecological zones, is highly effective for the tropics because diameter at breast height (DBH) alone explains more than 95% of the variation in aboveground tropical forest carbon stocks, even in highly diverse regions. Generalized allometric equations also have the major advantage of being based on larger numbers of trees that span a wider range of diameter classes. An extensive review of allometric equations concluded that the generalized models were 'the best available' way to estimate forest biomass and recommended them over local allometric models that may be based on less than 100 destructively sampled trees. Generally, the effort required to develop species-or location-specific relationships will not typically improve accuracy even if occasionally a localized relationship is warranted, as generalized equations may not adequately represent all forest types in all areas.

R = Annual rate of *Removals* during the *Crediting Period* according to the selected baseline.

C = tons of carbon per hectare per *Forest Type* in a given *Forest Condition*

EFL = number of hectares of *Eligible Forested Land* per *Forest Type* in a given *Forest Condition*

2. Calculating the *Crediting Period* baseline rate of *Removals* (R).

a. *Documented Prospective Removals Baseline*. The *Documented Prospective Removals Baseline* rate during the *Crediting Period* is calculated by multiplying the percentage of total prospective *Removals* during the *Crediting Period* by the annualized rate of the *Removals* during the *Crediting Period* according to the *Documented Prospective Removals Timeline* (ER2-1A3).

(1) The annualized rate of *Removals* during the *Crediting Period* is determined as follows:

(a) If all *Removals* are scheduled to be completed within one year, the annualized rate of *Removals* would be 100% divided by the number of years in the *Crediting Period*.

(b) If the *Documented Prospective Removals Timeline* called for *Removals* to be evenly distributed over 5 years, the annualized rate would be 20%.

(c) If the *Documented Prospective Removals Timeline* calls for unevenly distributed *Removals*, the annualized rate would reflect that percentage of *Removals* each year. (For example, 40% in year 1; 30% in year 2; 15% in year 3; 10% in year 4; and 5% in year 5.)

(2) By way of illustration, if 50% of the *Tree Biomass* is scheduled to be removed and the annualized rate for *Removals* is 20%, the R for *Documented Prospective Removals Baseline* would be 10% (50% * 20%) for each of the five years *Removals* were scheduled.

b. The *Governmental Removal Baseline* and the *Validated Removal Baseline* are themselves projected annual *Removal* rates that shall be used as R in the *Expected Carbon Stock Change* formula in B1 above.

C. Step 3: Calculate the *Observed Carbon Stock Change* for the *Crediting Period* for which the *Project Proponent* is seeking *RFS Credits*. The *Project Proponent* shall verify *Observed Carbon Stock* at such intervals as *Project Proponent* determines, but not less frequently than every five years.

1. The *Observed Carbon Stock* shall be calculated by the *Proponent Carbon Stock Expert* in accordance with the following, and subject to the *Public Commentary* and an *Automatic Review* in Section A2-4:

a. With its *Verification Request*, *Project Proponent* shall submit a *Carbon Verification Map*.

b. Remote-sensing resolution for a *Carbon Verification Map* can be as great as 5m, subject to the *Requirements* for resolution of less than 1m with respect to the five-year *Carbon Stock Adjustment* described in Step 10 (ER3-1J).

c. All remote-sensing data appearing on the *Carbon Verification Map* shall have been collected within 180 days prior to the *Verification Request*.

d. The *Proponent Carbon Stock Expert* shall estimate the *Observed Carbon Stock* on the *Carbon Verification Map* by multiplying the average carbon stock per *Forest Type* by *Forest*

Condition times the total number of hectares per *Forest Type* by *Forest Condition* and summing the results across all cells.

2. The *Observed Carbon Stock Change* shall be calculated by subtracting the *Observed Carbon Stock* on the current *Verification Date* from the *Observed Carbon Stock* on the immediately preceding *Verification Date*.

$$\Delta O (cp) = O (V2) - O (V1),$$

where O is the *Observed Carbon Stock*; cp is the *Crediting Period* in years (to nearest hundredth), V2 is the *Observed Carbon Stock* on the most recent *Verification Date*; and V1 is the *Observed Carbon Stock* on the preceding *Verification Date*.

- D. Step 4: To calculate *Gross Carbon Emission Change* during *Crediting Period*, compare *Expected to Observed Carbon Stock Change*.

1. *Gross Carbon Emission Change in Crediting Period = Expected Carbon Stock Change in Crediting Period less Observed Carbon Stock Change in Crediting Period; or*

$$\text{Gross } \Delta C (cp) = E (cp) - O (cp).$$

- E. Step 5: Calculating Aboveground Carbon Emission Change for the Crediting Period..

1. Multiply applicable *Leakage* rate, as determined under the *Requirements* of Section ER4 by the *Gross Carbon Emission Change* to arrive at the *Leakage Deduction*.
2. Subtract the *Leakage Deduction* from the *Gross Carbon Emission Change* to arrive at the *Aboveground Carbon Emission Change for the Crediting Period*.

- F. Step 6: Multiply *Aboveground Carbon Emission Change* by 20% (or other empirically established percentage pursuant to ER3-4) to arrive at *Belowground Carbon Emission Change*.
- G. Step 7: Multiply *Aboveground Carbon Emission Change* by 10% (or other empirically established percentage pursuant to ER3-4) to arrive at *Deadwood Carbon Emission Change*.
- H. Step 8: Sum *Leakage Deduction*, *Aboveground Carbon Emission Change*, *Belowground Carbon Emission Change*, and *Deadwood Carbon Emission Change* to arrive at *Net Carbon Emission Change*.
- I. Step 9: To arrive at *Project Emission Change*, multiply *Net Carbon Emission Change* in *Crediting Period* by 3.67.
- J. Step 10: Five year *Carbon Stock Adjustment* calculation.
1. If during any five-year interval following the *Project Start Date*, any *Observed Carbon Stock Change* verification is done with remote-sensing resolutions equal to or greater than 1m, the *Project Proponent* is required to provide a *Carbon Stock Adjustment* at the end of such five-year interval (plus or minus one year). The *Carbon Stock Adjustment* requires remote-sensing data collection at a resolution <1m because it is intended to capture evidence of small-scale removals that may have been missed with coarser scale sensing.
 2. If the *Carbon Stock Adjustment* reveals greater *Removals* of *Tree Biomass* than did the *Observed Carbon Stock Change Verification*, the difference (adjusted for calculation of *Belowground* and *Deadwood Carbon Emission Changes*) shall be treated as a *Reversal* and the appropriate number of credits deducted from any current balance in

the *Project's* credit account. If there is not a sufficient balance in the credit account, the deduction shall be from the next credits earned. The increase in *Removals* shall be presumed to have occurred solely during the *Crediting Period* immediately prior to the *Carbon Stock Adjustment*.

ER3-2 Project Emission Changes: Conversion to RFS Credits or RFS Debits.

A. In any *Crediting Period*, if *Project Emission Change* is positive, the change is considered a net reduction of CO₂e, and each tCO₂e shall earn one *RFS Credit* that shall be issued and documented as such in accordance with Section A6.

B. In any *Crediting Period*, if *Project Emission Change* is negative, the change is considered a net addition of CO₂e having produced greater emissions than expected, and each such tCO₂e shall earn one *RFS Debit* documented as such in accordance with Section A6. *RFS Debits* shall be deducted as of the *Verification Date* of the relevant *Crediting Period* from any *RFS Credit* balance; if no balance is available for immediate deduction, such *RFS Debits* shall be deducted from the next *RFS Credits* earned until the Debits are zero.

ER3-3 Automatic Review of Project Emission Change calculations. The multi-step calculation of *Project Emission Change* shall be subject to an *Automatic Review* by an *Assigned Carbon Expert* (see Exhibit E) pursuant to Section A2-4.

ER3-4 Belowground Tree Biomass and Deadwood Biomass standard addition adjustments to Aboveground Tree Biomass calculations are rebuttable presumptions. A *Project Proponent* may retain a *Proponent Carbon Stock Expert* to prepare a *Belowground Adjustment Report* or a *Deadwood Adjustment Report* providing clear and convincing evidence that the adjustments should be greater than the standard adjustments based on empirical data provided in accordance with the

Requirements below. Project Proponent may, in its discretion, submit a Belowground or a Deadwood Adjustment Report as part of its Final Project Submission Documents or in any Verification Request. Any such submission shall explicitly accept the findings of the Assigned Carbon Expert as final.

A. Belowground and Deadwood Adjustment Report Requirements.

- 1. All data submitted shall be derived from recognized Peer-reviewed Literature or government datasets.*
- 2. All statistical analyses shall use formulas and tests recognized as broadly valid in Peer-reviewed Literature.*

B. Any proposed Belowground or Deadwood Adjustment is subject to Automatic Review by an Assigned Carbon Expert in accordance with A2-4. The Assigned Carbon Expert shall issue its finding as to whether the evidence submitted by the Project Proponent is clear and convincing enough to change the standard addition and if so, the size of the alternative addition adjustment. The Assigned Carbon Expert's finding shall be final, and the Project Proponent shall be bound by the Assigned Carbon Expert's finding whether the discount is higher or lower than the standard deduction. For verification purposes, the discount shall reflect the finding.

ER4: LEAKAGE**OBJECTIVES:**

Properly account for *Activity-shifting* and *Market Leakage* when calculating *RFS Credits*.

RATIONALE:

Activity-shifting Leakage. When actors change their actions to reduce *Tree Biomass* removals inside the *Project Area* they may simply shift those actions to nearby areas. This phenomenon is known as *Activity-shifting Leakage*. *The RFS* requires *Activity-shifting Leakage* to be deducted from any *RFS Credits* in accordance with Section ER3-5. *Activity-shifting Leakage* is of two principal types: (a) leakage resulting from the intentional displacement of a *Documented Prospective Removal* activity such as infrastructure development or managed removals of *Tree Biomass*; and (b) leakage resulting from shifting local-scale activities such as grazing, agriculture, logging of timber, fuel wood collection, charcoal production, conversion to settlements, or fires set to clear land for non-forest purposes.

The RFS has adopted a standard discount for *Activity-shifting Leakage* rather than requiring *Projects* to do an actual on-site/off-site reconciliation study which is complex, expensive, and may not be replicable. *The RFS* standard discount is based on the most recent peer-reviewed studies of *Activity-shifting Leakage*. *The RFS* treats the standard discount as a rebuttable presumption, allowing *Project Proponents* to present evidence that the discount should be adjusted. For example, if an infrastructure project such as a power plant is moved from *Eligible Forested Land* in the *Project Area* to *Ineligible Forested Land* inside or outside the *Project Area*, there would be no deduction for *Activity-shifting Leakage* since activity is clearly displaced to a non-forest area.

Market Leakage: Some agricultural and timber products harvested in a proposed *RFS Project Area* may have previously been sold into local, regional, national, or international markets. Stable or rising demand interacting with decreased product supplies caused by *The RFS Project(s)* may create market pressure and possibly price increases, giving other producers financial incentive to grow supplies in other places, near or far from the *Project Area* ("*Market Leakage*"). The relative emission potential of different production regions can significantly affect the CO₂e emissions related to the spatial shift in production of these commodities and this is determined mainly by the carbon stocks of the affected *Forest Types* (or other land uses) which vary significantly across regions. *The RFS* acknowledges that while national monitoring and reconciliation would be the ideal way to detect all *Leakage*, it sees that option as many years away and therefore applies a standard deduction based on published market models. *Market Leakage* studies can be even more complex than *Activity-shifting Leakage* studies.

REQUIREMENTS:

ER4-1 The *Project Proponent* is advised that *The RFS* requires the following standard deductions be taken with respect to offsetting *Activity-shifting Leakage* and *Market Leakage* presumed to occur as the result of reducing *Tree Biomass* removals within the *Project Area*. The deductions will be taken in every *Crediting Period* in accordance with Step 5 of Requirement ER3-1. For example, if 1000 *RFS Credits* would otherwise have been verified, and a discount of 10% is taken, 900 credits will actually receive verification. The standard discounts may change from time to time.

ER4-2 In the event a standard deduction is increased during the *Project Period*, the standard deduction shall not increase for the *Project*.

ER4-3 In the event a standard deduction is decreased during the *Project Period*, the standard deduction shall be decreased for the *Project*. Such decrease shall take effect on the *Verification Date* immediately following the decrease.

ER4-4 The *RFS* standard deduction for *Activity-shifting Leakage* shall be 5%.

ER4-5 The *RFS* standard deduction for *Market Leakage* shall be the applicable percentage found in Table ER4-5 below³.

Table ER4-5 Standard deductions for <i>Market Leakage</i> (commodity / country)				
	Soybeans	Cattle	Timber (tropical)	Sugarcane
Bolivia	2.9%	0.6%	0.4%	0.5%
Brazil	30.8%	18.6%	8.3%	21.3%
Colombia	0.1%	3.0%	0.5%	2.7%
Ecuador	0.1%	0.8%	0.1%	0.7%
Peru	0.0%	0.6%	1.0%	0.6%

The deduction shall be calculated using the values in Table ER4-5 with the *Contiguous Use Method*, as follows:

A. The proportion of the *Project Boundary* contiguous to each use described in Table ER4-5 shall be deemed the *Market Leakage* type to be calculated.

1. As an illustration, assume the *Project* is in Colombia and the *Project Boundary* is 40km. Assume further that contiguous uses along the *Project Boundary* are: soybean fields, 0.8 km; cattle ranches, 5 km; legal timber extraction, 3km; sugarcane fields, 10 km; activities other than the four commercial activities identified in Table ER4-5, 21.2km.

³ The source of the percentages in this Table are Murray, B.C., B.A. McCarl, and H. Lee. 2004. Estimating *Leakage* from Forest Carbon Sequestration Programs. *Land Economics* 80(1):109-124; and Murray, B. C., C. S. Galik, W. A. Jenkins, J. D. Schneck 2010. *Project Standards Development for the Amazon Forest Carbon Partnership: An Assessment of Options for Additionality, Permanence, and Leakage* – Final Report; Nicholas Institute for Environmental Policy Solutions, Duke University. Methods of Murray, et al (2004) may be used for other commodities using most recent data of FAOSTAT.

a. The first step is to determine what proportion of the *Project Boundary* is occupied by a particular use. In the case of this illustration: soybeans = 2% (.8/40); cattle = 12.5% (5/40); timber = 7.5% (3/40); and sugarcane = 25% (10/40).

b. The second step is to multiply the proportion of the use by the *Leakage* factor in Table ER4-5: soybeans = .002% (2%*.1%); cattle = .375% (12.5%*3%)*timber = .0375% (7.5%*.5%); and sugarcane = .675 % (25%*2.7%).

c. The third step is to aggregate the totals for each factor to create a composite *Market Leakage* rate for the *Project*. For the above illustration, the composite rate would be (.002+.375+.0375+.675) = 1.0895%.

2. It is understood that the *Contiguous Use Method* may not reflect the actual proportion of nearby area uses. However, it is difficult to determine the appropriate overall area to include in any assessment (i.e., how far to go beyond the *Project Boundary*); any general rule is likely to be somewhat arbitrary. The *Contiguous Use Method* assures that the threat of conversion is real since it touches the *Project Area*. Moreover, describing the boundaries of a larger area to be included in a broader analysis requires significantly more mapping and analysis, at a significant cost in time and money without providing a clearly more valid assessment.

B. The *Market Leakage* standard deduction calculations in ER4-5A shall be provided in a *Market Leakage Report* as part of the *Final Project Submission Documents* and subsequent *Verification Requests*.

1. The *Market Leakage Report* shall be prepared by a *Proponent Land Use Expert* active in the *Project Area* selected by *Project Proponent* and shall include the following:

- a. the calculations set forth in ER4-5A;
- b. the sources of information used to identify contiguous uses;
- c. *Representation* by the *Proponent Land Use Expert* that to the best of their knowledge and belief the sources of information and calculations are accurate and complete in all material respects; and
- d. A *Personal Representation* by the *Project Proponent's* and the *Project Developer's* top executive officer (e.g., CEO, Principal Partner, Executive Director) in his or her personal capacity, as well as by the *Project Proponent* and *Project Developer* that the information in the *Market Leakage Report* is accurate and complete in all material respects to the best of his/her knowledge and belief after a full, good faith investigation.

ER4-6 Alternatives to standard deduction for Activity-shifting Leakage and Market Leakage. Standard deductions are based on rebuttable presumptions with respect to *Leakage*. The *Project Proponent* may retain a *Proponent Leakage Expert* to prepare a *Leakage Alternative Deduction Report* providing clear and convincing evidence that the deductions should be lower than the standard deductions based on empirical data provided in accordance with the *Requirements* below. The *Project Proponent* may, in its discretion, submit a *Leakage Alternative Deduction Report* as part of the *Final Project Submission Documents* or in any *Verification Request*. Any such submission shall explicitly accept the findings of the Assigned *Leakage Expert* (see ER4-6C below) as final.

A. *Leakage Alternative Deduction Report Requirements.*

1. All data submitted shall be derived from recognized *Peer-reviewed Literature* or government datasets.
2. All statistical analyses shall use formulas and tests recognized as broadly valid in *Peer-reviewed Literature*.

B. Any proposed *Leakage* Alternative Deduction is subject to *Automatic Review* by an *Assigned Leakage Expert* in accordance with A2-4. The *Assigned Leakage Expert* shall issue its finding as to whether the evidence submitted by the *Project Proponent* is clear and convincing enough to change the discount and if so, what the *Project Leakage* discount should be. The *Assigned Leakage Expert's* finding shall be final, and the *Project Proponent* shall be bound by the *Assigned Leakage Expert's* finding whether the discount is higher or lower than the standard deduction. For verification purposes, the discount shall reflect the finding.

ER5: PERMANENCE

OBJECTIVES:

RFS Credits represent permanent⁴ rather than temporary reductions in CO₂e emissions. Therefore, throughout the *Permanence Period*, the *RFS Credit* accounting system requires the *Project Proponent* to demonstrate its ability to provide the number of credits required to replace all previously issued *RFS Credits* to the full extent required by a *Reversal* of any size ("*Full Replacement*").

Consistent with *The RFS's* design as outcome-based rather than prescriptive, *The RFS* does not specify whether *Full Replacement* is provided through sellers, buyers, third parties, or a combination thereof, allowing *Project Proponents* to make that decision. Similarly, *The RFS* provides a range of financial options *Project Proponents* may use to comply with the *Permanence Requirements*.

RATIONALE:

Temporary nature of emission reductions from reduced removals of *Tree Biomass*.

RFS Projects create value by retaining carbon in terrestrial carbon stocks instead of releasing it into the atmosphere. However, the stored carbon is subject to later emission, or "*Reversal*." The potential for *Reversal* stems from a range of intentional and unintentional occurrences. For example, a *Rightsholder* may decide to remove *Tree Biomass* to allow farming or ranching, or to sell harvested timber; or a fire set off by lightning destroys forest; or there is illegal harvesting beyond the control of *Rightsholders*. The potential for *Reversals* means that credits issued are essentially provisional or temporary; they do not become permanent until the carbon represented by the credit has stayed in the terrestrial stock for the entire *Permanence Period*⁵.

⁴ The *RFS* defines "permanent" as 100 years from a *Project Start Date*, i.e., its *Permanence Period*.

⁵ The *Ton-Year Accounting* approach is an exception – under that arrangement crediting is limited to the equivalent CO₂e value only for the time sequestration has occurred. For example, if 200,000 tCO₂e were not emitted, only 2,000 tCO₂e would be available for crediting under the T/Y approach. Thus, upon a reversal no compensating catch-up is required; *Full Replacement* is effectively a constant state under T/Y.

This is especially important for credits that will be used as offsets in a compliance market: the failure to replace reversed credits means that more CO₂e was emitted than would have been if no crediting were permitted in the first place. This has been formally recognized under the Kyoto Protocol in the cases of afforestation and reforestation in which credits for creating those carbon sinks are deemed temporary and only time-delimited credits (CERs) requiring *Full Replacement* are permitted. *The RFS* takes the position that *Permanence* requires *Full Replacement* as if the credited reductions had been used as offsets, even in a voluntary system in which credits are not used as offsets.

Ensuring that *RFS Credits* are permanent is a central goal of *The RFS* and means effectively solving the *Reversal* problem. The ability of relatively small *Reversals* in restricted areas to negate (reverse) presumed emission reductions from large areas over long periods of time is not intuitive and may have been underestimated as can be seen in the following example:

Box 3: The *Reversal* Problem.

Assume an average of 400 tCO₂e per hectare, a *Project Area* of 100,000 ha, and a reduction in emissions of 1% per ha below expectations. This would yield 4 credits per ha and 400,000 credits per year. If the project has received 400,000 credits per year for 10 years, it will have received 4,000,000 credits in total. Now assume a *Reversal* on just 10,000 ha or 10% of the *Project Area*. This *Reversal* releases 4,000,000 tCO₂e into the atmosphere. All the CO₂e savings from the past 10 years are eliminated. The *Project* will have been credited for reducing emissions by 4,000,000 tCO₂e when in effect it will have not have accounted for any reductions in the end once the *Reversal* has occurred. Emitters that used *The RFS Credits* as offsets put an additional 4,000,000 tCO₂e into the atmosphere and the *Reversal* put 4,000,000 tCO₂e into the atmosphere for a total of 8,000,000 tCO₂e, twice the expected emission. To restore the tCO₂e account to balance, the *Project* owes 4,000,000 tCO₂e – it must replace credits in that amount, i.e. *Full Replacement*. This example demonstrates why all issued credits (other than *Ton-Year* credits) can be viewed as Temporary until there is an assurance that *Reversals* can be accounted for and compensated by *Full Replacement*.

To earn the label Permanent instead of Temporary, *The RFS* allows *Project Proponents* to choose among a range of mechanisms that guarantee that any *RFS Credits* can and will be replaced in the event of a *Reversal* during the *Permanence Period*. Depending on the

mechanism the *Project Proponent* chooses, the source of the replacement can be sellers, buyers, third parties, or a combination thereof.

Permanence Period

The *RFS* requires that *Full Replacement* be guaranteed for the *Permanence Period*, which it defines as 100 years from the *Project Start Date*. There is some scientific uncertainty about how long CO₂e resides in the atmosphere. Individual molecules of CO₂e are reabsorbed typically within 5–10 years, but rising aggregate emissions of CO₂e can alter the equilibrium and lead to elevated levels of CO₂e for 50–200 years or more (*IPCC* 2007). Amid this scientific uncertainty, common practice is to treat the relevant atmospheric residency for CO₂e as 100 years. For example, the global warming potential (GWP) factors across the 6 major GHGs are developed by the *IPCC* using the cumulative radioactive forcing of these individual gases for 100 years as the effective point of comparison for their relative potency. In this sense, 100 years is a policy decision rather than a purely scientific finding.

Post-Project Liability

In addition to the *Reversal* risks described above, there is another risk *The RFS* is designed to avoid – “*Post-Project Liability*”. *Post-Project Liability* arises when the *Project Period* is shorter than the *Permanence Period*. This can occur if: the *Project Proponent’s* rights in the *Project Area* are limited to a specified period (e.g., a 20-year concession; a 50-year lease); if the *Project Proponent* has provided a *Termination Date Notice*; or if there is a *Project Abandonment*. *Post-Project Liability* also arises if a *Project Proponent* voluntarily terminates the *Project* (which it is free to do at any time). Several mechanisms offered as options in the *Requirements* have relatively straightforward means for offsetting *Post-Project Liability* (*Ton-Year Accounting*; *Permanence Trust Fund*; *Qualified Buffer System*; temporary *RFS Credits*). Others require assurances of ongoing *Post-Project Liability* protection (*Guarantees*).

Sellers, Buyers, Third Parties: Who bears the risk of Full Replacement?

The RFS does not specify and does not intend to designate the party that is ultimately economically responsible for fulfilling *Permanence Requirements*. In economic terms, sellers and buyers always price risk thereby sharing in the risk: a seller will accept a lower price with less risk; a buyer will pay a higher price with less risk. Some of the *Permanence* mechanisms that a *Project Proponent* can choose in *Requirements* shift the risk of replacement in whole or part to the buyer (offset-buyer guarantees; temporary credits). Other mechanisms (*Ton-Year Accounting*; *Permanence Trust Fund*; *Qualified Buffer System*) provide the seller with access to partial credit income without any future liability, but require performance throughout the *Permanence Period* for full crediting. Still other mechanisms look to third parties for assurances, or to a combination of mechanisms that may include sellers, buyers, and third parties.

REQUIREMENTS:

A *Reversal* is defined as the voluntary, human-induced removal of *Project Area Tree Biomass* that had previously generated a *RFS Credit* for having stored carbon in that *Project Area Tree Biomass* (see ER5-10 for more detailed explanation). To assure the *Permanence* of credits issued under **The Rainforest Standard**, defined as the *Full Replacement* of issued credits in the event of a *Reversal* during the *Permanence Period*, *Project Proponents* can choose from among the *Permanence* mechanisms detailed in ER5-1 through ER5-9. A *Project Proponent* shall identify the mechanism or combination of mechanisms it chooses on the *Permanence Option Template* (see Template ER5), which shall be submitted with its *Initial Project Submission Documents*.⁶

⁶ For an interactive tool to analyze project cash flow and present value for the *Ton-Year Accounting* approach (ER5-5), the *Permanence Trust Fund* (ER5-6), and the *Qualified Buffer System* (ER5-7), and to compare these options in terms of cash flow and present value, see Appendix ER5.]

ER5-1 Offset Purchaser Guarantees

In at least one compliance market being developed at the present time, buyers of issued credits using them as offsets (*Offset Purchasers*) are being asked to guarantee that *Reversals* of any reduced emissions underlying such credits be replaced by the *Offset Purchaser*. To our knowledge, no such requirement has been suggested for buyers of voluntary credits. From a carbon accounting perspective, if there is a *Reversal* that is reimbursed by the *Offset Purchaser*, no net increase in emissions will have occurred. A credit reimbursement requirement can be imposed effectively by a regulatory authority in a compliance system; however a credit reimbursement requirement cannot be effectively imposed in a voluntary system unless there are well-established legal rights and remedies that assure effective enforcement. Therefore, *The RFS* accepts *Offset Purchaser* guarantees subject to the following:

- A. *Offset Purchaser* must have a binding and enforceable legal obligation to the *Governmental Authority* responsible for maintaining and managing the compliance system in question for making *Full Replacement* of any credits issued for emission reductions in the *Project Area*.

- B. *Offset Purchaser* must demonstrate that it has the financial capacity to meet its obligations in ER5-1A. Such capacity shall be deemed met if:
 - 1. The *Governmental Authority* officially accepts the *Offset Purchaser* guarantee; or
 - 2. *Offset Purchaser* has a *Financial Strength Rating* of A- or higher; or
 - 3. A third party with a *Financial Strength Rating* of A- or higher unconditionally guarantees the *Offset Purchaser's* obligation; or
 - 4. The *Offset Purchaser* has provided satisfactory security in cash or in kind for *Full Replacement*.

ER5-2 Seller Guarantees

For the purpose of this section ER5, the term “Seller” includes any individual or entity that participates in developing or transferring a *RFS Credit* to an *Offset Purchaser*. In this broad sense, Seller includes any *Project Participant* and any *Intermediary* between a *Project Participant* and an *Offset Purchaser*, as well as any partner of a *Project Participant* or *Intermediary*. Any one or more individuals or entities defined in this section as a Seller can provide all or part of a *Seller Guarantee* (such individual or entity: “*Seller Guarantor*”). The *RFS* accepts *Seller Guarantees* subject to the following requisites:

- A. The *Seller Guarantee* shall be in the form set forth in Template ER5-2, and signed by the *Seller Guarantor*.
- B. *Seller Guarantor* must demonstrate that it has the financial capacity to meet its obligations in ER5-3A. Such capacity shall be deemed met if:
 - 1. The *Seller Guarantor* has a *Financial Strength Rating* of A- or higher; or
 - 2. A third party with a *Financial Strength Rating* of A- or higher unconditionally guarantees the Seller’s obligation; or
 - 3. The Seller has provided satisfactory security in cash or in kind for *Full Replacement* in the event of a *Reversal*.

ER5-3 Third-Party Guarantee

A third party individual or entity other than a *Project Participant*, *Intermediary*, or *Offset Purchaser* may guarantee *Full Replacement*⁷. Possible examples of such *Third-Party Guarantor* include: a donor, a foundation, a consortium of public or private entities. The *RFS* accepts *Third-Party Guarantees* subject to the following requisites:

- A. The *Third-Party Guarantee* shall be in the form set forth in Template ER5-3, and signed by the *Third-Party Guarantor*.

⁷ While it is conceivable that an insurance company could offer insurance to cover a voluntary reversal, this appears to be a moral hazard problem that even if legal under its regulatory regime, no reputable company would be likely to undertake. In the event such insurance were to become available, *The RFS* would prescribe *Requirements* therefor.

B. *Third-Party Guarantor* must demonstrate that it has the financial capacity to meet its obligations in ER5-3A. Such capacity shall be deemed met if:

1. The *Third-Party Guarantor* has a *Financial Strength Rating* of A- or higher; or
2. The *Third-Party Guarantor* has provided satisfactory security in cash or in kind for *Full Replacement* that in the event of a *Reversal* is transferable in accordance with Section A6.

ER5-4 Ton-Year Accounting

The underlying concept of *Ton-Year Accounting* is that even if carbon stored rather than emitted today is emitted in the future it has provided at least a temporary carbon removal function that has kept atmospheric concentrations down for a period of time. In essence, there is a time value of temporary storage or emissions delay. Therefore, if a *Reversal* occurs during the *Permanence Period*, carbon stored rather than emitted prior to the *Reversal* can be treated as if some proportion had been kept out of the atmosphere for 100 years, i.e. its “100 year equivalence value” (see Noble et al. 2000 for a review). This concept is operationalized by *The RFS* in this section ER5-4.

The *Ton-Year Accounting* algorithm adopted by *The RFS* assumes an *Accumulation Rate* of 1% per annum on a linear basis. While both linear and nonlinear alternative *Accumulation Rate* algorithms have been proposed, *The RFS* accepts the 1% linear rate as a reasonable, conservative, and practicable reflection of current scientific knowledge with respect to equivalence over 100 years.

Calculation of the total number of tons of CO₂e stored permanently by the *Project* in any given year under *Ton-Year Accounting* is illustrated in Table ER5-4. The resulting “Permanent Tons Earned” (see Table ER5-4) are those considered permanent based on their 100-year equivalence value, and thus have no residual *Reversal* liability regardless of the cause or size of a *Reversal*.

The illustration in Table ER5-4 assumes annual reductions of 1000 tons of CO₂e each year. The 1000 tons reduced in Year 1 produces 1000 ton years worth of savings. The next year, that same 1000 tons saved in Year 1 is successfully maintained, which counts for another 1000 ton-years worth of savings in Year 2. But another 1000 tons is also saved from removal in that period, so the total ton years produced in Year 2 is 2000, and the cumulative ton-years produced by the *Project* is 3000. Using an *Accumulation Rate* of 1% of permanent tons generated for each ton year produced, the *Project* produces 10 tons of credits in the first year, 20 more in the second year, 30 more in the third year, and so on. (See Appendix ER5 for an interactive example that shows actual reductions based on carbon density, the level of removal reductions, and *Project* size, as well as projected cash flows and present values depending on a range of assumptions.)

Table ER5-4. “Permanent” reductions over time using the Ton-Year equivalence approach (one tone-year = 0.01 permanent tons).					
Period	Emission Reduction (tons)	Cumulative Reduction (tons)	Cumulative Ton Years	Permanent Tons Earned @ 0.01	Percentage of Full Credits
1	1,000	1,000	1,000	10	1.0%
2	1,000	2,000	3,000	30	1.5%
3	1,000	3,000	6,000	60	2.0%
4	1,000	4,000	10,000	100	2.5%
5	1,000	5,000	15,000	150	3.0%
6	1,000	6,000	21,000	210	3.5%
7	1,000	7,000	28,000	280	4.0%
8	1,000	8,000	36,000	360	4.5%
9	1,000	9,000	45,000	450	5.0%
10	1,000	10,000	55,000	550	5.5%
20	1,000	20,000	210,000	2,100	10.5%
30	1,000	30,000	465,000	4,650	15.5%
40	1,000	40,000	820,000	8,200	20.5%
50	1,000	50,000	1,275,000	12,750	25.5%
60	1,000	60,000	1,830,000	18,300	30.5%
70	1,000	70,000	2,485,000	24,850	35.5%
80	1,000	80,000	3,240,000	32,400	40.5%
90	1,000	90,000	4,095,000	40,950	45.5%
100	1,000	100,000	5,050,000	50,500	50.5%

A. The *Project* will receive *RFS Credits* only upon the filing of a *Ton-Year Credit Request*, on the form shown on Template ER5-4 in accordance with the following:

1. The *Ton-Year Credit Request* must be filed within 30 days of a *Verification Date*; and
2. The *Ton-Year Credit Request* shall specify the number of credits being requested which shall not exceed the number of issued credits indicated as the Percentage of Full Credits in Table ER5-4 for the verified storage duration.

3. The *Ton-Year Credit Request* shall specify any previously issued credits, which shall be deducted from the gross amount earned according to Table ER5-5.

B. If the *Project* has opted for *Ton-Year Accounting*, the *Project Proponent* shall be permitted to either pledge or borrow against the number of issued credits indicated as the Percentage of Full Credits in Table ER5-4 for the verified storage duration.

C. **Alternative Accumulation Rates.** While having adopted the 1% *Accumulation Rate*, *The RFS* recognizes legitimate differences in scientific judgments about the 100-year equivalence factor.

1. In the event that a peer-reviewed consensus emerges that another algorithm better captures the realities of equivalence, that algorithm may be adopted by *The RFS*. However, if the new algorithm allows fewer credits for the same storage duration, the original algorithm shall remain in force for the *Project*. In the event the new algorithm allows more credits for the same storage duration, the *Project Proponent* shall have the option to apply the new algorithm and be credited immediately for any credits it would have earned in the past if the new algorithm had been in effect since the *Project Start Date*.

2. Alternatively, if the *Project Proponent* believes it can provide clear and convincing evidence of the reasonable validity of another *Accumulation Rate* algorithm, the *Project Proponent* may, in its discretion, submit an *Alternative Accumulation Rate Report* as part of its *Initial* or *Final Project Submission Documents*. Such a Report shall be prepared by a *Proponent Full Replacement Alternative Expert* selected by the *Project Proponent* and retained at its sole cost and expense. The Report shall be prepared for the purpose of providing clear and convincing evidence that the proposed *Accumulation Rate* algorithm is valid and shall include a *Representation* by the *Proponent Full Replacement Alternative Expert* that to the best of her/his/its knowledge and belief after a full, good faith investigation the information in the Report is accurate and complete

in all material respects. The submission of such a Report shall be deemed an explicit acceptance of the findings of the *Assigned Full Replacement Alternative Expert* as final, without right of further review or appeal.

a. *Alternative Accumulation Rate Report Requirements.*

1. All general data submitted shall be derived from recognized *Peer-reviewed Literature* or government datasets.
2. All statistical analyses shall use formulas and tests recognized as broadly valid in *Peer-reviewed Literature*.

b. Pursuant to Section A2, a *Public Comment Period* follows submission of the *Initial* or *Final Project Submission Documents*. Within 10 business days of the end of the *Public Comment Period*, all analyses and all comments posted shall be submitted to the *Assigned Full Replacement Alternative Expert*.

c. Within 30 days of submission to the *Assigned Full Replacement Alternative Expert*, the *Assigned Full Replacement Alternative Expert* shall issue its finding as to whether the evidence submitted by the *Project Proponent* is sufficiently clear and convincing to justify use of the proposed Accumulation Rate algorithm. The *Assigned Full Replacement Alternative Expert's* finding shall be final, and the *Project Proponent* shall be bound by the *Assigned Full Replacement Alternative Expert's* finding.

D. *Ton-Year Accounting* may be blended with other *Permanence* mechanisms in this section ER5. For example, in the case of Guarantees, *Ton-Year Accounting* could be used to absorb a proportion of *Full Replacement* liability, thus reducing the *Full Replacement* obligations of those options. (See Appendix ER5 for an interactive tool in which *Ton-Year Accounting* can be combined with the *Permanence Trust Fund* or *Qualified Buffer*).

ER5-5 Permanence Trust Fund

The *Permanence Trust Fund* option requires that all issued *RFS Credits* be placed in a trust or escrow account for the entire *Permanence Period*, but issued credits can be withdrawn and sold annually to the extent necessary to distribute to the *Project* the *Average Endowment Rate Of Return* (currently assumed to be 5% for purposes of analysis with the *Permanence Tool* in Appendix ER5) of the cumulative current value of the *Permanence Trust Fund*. In limited circumstances, some principal may be released (see ER5-5D). (See Appendix ER5 for an interactive example that shows *projected* cash flows and present values depending on a range of assumptions.)

The concept behind the *Permanence Trust Fund* (PTF) is that in the event of a *Reversal* requiring *Full Replacement*, a very high percentage of verified *RFS Credits* remain in the PTF and available for replacement. The actual percentage of *RFS Credits* retained in the PTF varies with the rate of emission reductions, the market price of *RFS Credits*, the *Average Endowment Rate Of Return* and other variables all of which can be entered into the interactive the *RFS Interactive Permanence Tool* at Appendix ER5. In addition, the rapidly building cumulative credit balances provide a strong financial incentive for *Project Proponents* to remain committed to conserving the *Eligible Forested Lands* for the long-run, regardless of the alternative uses that emerge over time. Cash flows are generated on the full value of the verified *RFS Credits* that are in the PTF. Importantly, each *Project* provides all the credits required for *Full Replacement* without relying on any pooled or other credits from other sources; therefore, *Project* risk assessments are not necessary and complex portfolio risk decisions do not need to be modeled.

A. Verified *RFS Credits* will be issued and placed in the account of the *Project* (*Project PTF Account*) held in trust or escrow by an entity (*Depository*) selected by the *Project Proponent* from those listed on Schedule ER5-5_A. The *Depository* shall provide a quarterly *Depository Statement* to the *Project Proponent*. The *Depository Statement* shall set forth, in form substantially equivalent to Template ER5-5_A, the transactional history of the account including the dates *RFS Credits* were issued, their amounts, any withdrawals, and cumulative balances. *Depository Statements* shall be published on the *Project Webpage*.

B. Upon the filing of a *RFS Distribution Request* on the form shown on Template ER5_B, the *Depository* shall distribute to the *Project* the number of credits (*RFS Current Credit Distribution*) calculated in accordance with the Steps set forth in Schedule ER5-5_B (see Appendix ER5, *RFS Interactive Permanence Tool*, for an interactive example of the calculation).

C. The price used to calculate the Cumulative Current Market Price Value is defined as the median Bid Price of a *RFS Credit* on the *Verification Date* immediately preceding *The RFS Distribution Request* determined by any of the following sources, one of which shall be selected by the *Project Proponent* and identified in *The RFS Distribution Request*:

1. Any public exchange on which *RFS* or equivalent credits are traded;
2. An exchange-based trading mechanism allowing daily price discovery for emission allowances equivalent to *The RFS Credits* traded on such exchange (whether on a spot or forward basis), or
3. An OTC market sufficiently active to enable reputable commodity broking firms to operate and thus provide at least three price points on any trading day.

D. Releasing principal by blending mechanisms. The *Permanence Trust Fund* may be blended with other *Permanence* mechanisms in this section ER5. Blending mechanisms could permit the principal balance in the *Permanence Trust Fund* to be released to the *Project Proponent*. For example, *Ton-Year Accounting* could be applied to release from principal a Percentage of Full Credit in accordance with the schedule set forth in Table ER5-4. Similarly, any qualifying guarantees could be applied to cover credits released from a principal account.

E. Other than by withdrawing issued *RFS Credits* pursuant to ER5-5B or D, the *Project Proponent* or any *Project Participant* shall be permitted to pledge, borrow against, or

otherwise monetize credits in the *Permanence Trust Fund* to a maximum of that amount it could have released if it had opted for *Ton-Year Accounting*.

F. *Credit Deficit Reduction*. In the event that *Full Replacement* for a *Reversal* requires debiting more than the entire balance of credits in the *Project PTF Account*, a *Credit Deficit* will be noted. Any subsequently verified credits shall be applied first to reducing to zero the Credit Deficit.

ER5-6 Qualified Buffer System

The *RFS* will issue credits without the requirement of *Full Replacement*, if a *Qualified Buffer System* is in place and has assessed the *Project* in accordance with its rules. The *RFS* will provide credits to the *Project Proponent* and to the *Qualified Buffer System* in accordance with the *Qualified Buffer System's* buffer credit requirement for the *Crediting Period* in question. (See Appendix ER5 for an interactive example that shows *projected* cash flows and present values for a Qualified Buffer depending on a range of assumptions.)

A. A *Qualified Buffer System* shall be an entity that has all of the following attributes:

1. Transparency with respect to the identity and amount of all credit holdings, all contingent obligations to deliver credits, audited balance sheet and income and expense statements, and full disclosure as if the entity were a large financial institution, insurance company, or public company in the country in which the *Project* is located, subject to the same governmental oversight and regulation with respect to its balance sheet, and risk and capital management.
2. A management unit that:
 - (a) is legally constituted and authorized to do business in the jurisdiction in which the *Project Area* is located;
 - (b) is legally authorized to hold credits and disburse credits;
 - (c) has a *Financial Strength Rating* of A- or better;
 - (d) has a staff of or binding contractual arrangements with *Experts* with a successful history of evaluating the appropriate number of credits to be

placed in the buffer system that is consistent with the model described in ER5-6A4.

3. All parameters of its portfolio are transparent and published. At a minimum, the following information shall be provided:

- a. Whether the buffer system accepts all *Projects*, all *Projects* with a risk assessment profile below a certain threshold, or only *Projects* whose risk assessment profiles match a pre-existing model for overall risk management when within the existing portfolio of *Projects*; and
- b. which factors, and their respective weightings, the buffer system uses to build its *Project* portfolio, including *Project* size, forest density, carbon density, proximity and accessibility to *Drivers Of Deforestation*, strength of *Project* ownership, number of *Rightsholders*, and similar factors that affect the likelihood and size of *Reversals*; and
- c. the algorithms used to determine *Project* acceptance, and the size of the buffer.

4. The buffer system protocols and permitted portfolio options have been subjected to quantitative risk modeling using widely accepted econometric techniques and tested using sensitivity analysis across a wide range of realistic possibilities.

(a) Quantitative risk modeling shall be done in accordance with protocols published in *Peer-reviewed Literature* or using algorithms that have been tested and have produced consistently positive results that have been published in *Peer-reviewed Literature*.

(b) Sensitivity analysis should at a minimum apply the variables listed in ER5-6A3.

5. Demonstrable capacity and willingness to provide *Full Replacement* credits in the event of a *Reversal*.

(a) An unconditional *Representation* by the buffer system that it has the obligation and capacity to provide *Full Replacement* in the event of a *Reversal* from whatever source.

(b) Unconditional written commitment that in case of a *Reversal* the buffer system will deliver credits, up to *Full Replacement*, to the individual or entity designated by *The RFS* upon its issuance of *RFS Credits*.

B. A *Qualified Buffer System* may be private, public, charitable, for-profit, not-for-profit, a government or governmental entity, or other set of public and or private entities.

C. If the *Project Proponent* proposes to use a *Qualified Buffer System*, the *Project Proponent* shall submit a *Qualified Buffer System Report* as part of its *Initial* or *Final Project Submission Documents* or in any *Verification Request*. Such Report shall be prepared by a *Proponent Full Replacement Alternative Expert* selected by the *Project Proponent* and retained at its sole cost and expense. The Report shall be prepared for the purpose of providing clear and convincing evidence that the *Qualified Buffer System* meets the *Requirements* of subsection ER5-6A and shall include a *Representation* by the *Proponent Full Replacement Alternative Expert* that to the best of her/his/its knowledge and belief after a full, good faith investigation the information in the Report is accurate and complete in all material respects. The submission of such a Report shall be deemed an explicit acceptance of the findings of the *Assigned Full Replacement Alternative Expert* as final, without right of further review or appeal.

1. *Qualified Buffer System Report Requirements*.

a. All general data submitted shall be derived from recognized *Peer-reviewed Literature* or government datasets.

b. All statistical analyses shall use formulas and tests recognized as broadly valid in *Peer-reviewed Literature*.

c. All financial information shall be prepared in accordance with Generally Accepted Accounting Practices supported by documentation independently verified in writing by a *Financial Statement Preparer*.

d. Any references to legal constraints, legal enforcement mechanisms, or other legal aspects of the *Full Replacement Alternative* shall be supported by a *Legal Opinion* provided by a law firm retained by *Project Proponent* directly and explicitly confirming the accuracy of all information and interpretations.

2. Pursuant to Section A2, a *Public Comment Period* follows submission of the *Initial* or *Final Project Submission Documents* and pursuant to Section A5 a *Public Comment Period* follows submission of a *Verification Request*. Within 10 business days of the end of the *Public Comment Period*, all analyses and all comments posted shall be submitted to the *Assigned Full Replacement Alternative Expert*.

3. Within 30 days of submission to the *Assigned Full Replacement Alternative Expert*, the *Assigned Full Replacement Alternative Expert* shall issue its finding as to whether the evidence submitted by the *Project Proponent* is clear and convincing enough to assure *Full Replacement* by the *Project Proponent* in the event of a *Reversal*. The *Assigned Full Replacement Alternative Expert's* finding shall be final, and the *Project Proponent* shall be bound by the *Assigned Full Replacement Alternative Expert's* finding.

ER5-7 Temporary RFS Credits

Temporary RFS Credits are in some ways analogous to the credits generated by an *Offset Purchaser Guarantee*: both rely on guarantees by buyers that use the credits in a compliance offset market. In the case of a *Temporary RFS Credit*, the purchaser is guaranteeing replacement of all issued credits upon their expiration (commonly, five years), whereas in the case of the *Offset Purchaser Guarantees* the obligation of the purchase only arises in the event of a *Reversal*. One difference between the *Offset Purchaser Guarantee* and a *Temporary RFS*

Credit is that the *Temporary RFS Credit* creates an ongoing incentive for sellers to prevent removals since the *Project Proponent* can resell its verified reductions at the end of each five-year term throughout the *Permanence Period*.

A *Project Proponent* may opt for the issuance of "*Temporary RFS Credits*" which shall expire at the end of five years from the date on which they are issued subject to the following conditions:

- A. The transfer of *Temporary RFS Credits* is restricted to *Offset Purchasers* that:
 - 1. Use the *Temporary RFS Credits* in a compliance market that explicitly accepts temporary credits and requires all of the *Temporary RFS Credits* to be replaced upon their expiration; and
 - 2. Otherwise meet all the *Requirements* for *Offset Purchasers* set forth in ER5-1.
- B. Once expired, the *Temporary RFS Credits* may not be transferred.
- C. The expiration date of the *Temporary RFS Credits* shall be recorded as part of their documentation.

ER5-8 Full Replacement Alternative

If the *Project Proponent* claims that it can provide clear and convincing evidence of its unconditional willingness and capacity for *Full Replacement* by means other than as described in Sections ER5-1 through ER5-7, the *Project Proponent* may, in its discretion, submit a *Full Replacement Alternative Report* as part of its *Initial* or *Final Project Submission Documents* or in any *Verification Request*. Such Report shall be prepared by a *Proponent Full Replacement Alternative Expert* selected by the *Project Proponent* and retained at its sole cost and expense. The Report shall be prepared for the purpose of providing clear and convincing evidence that the *Project Proponent* is willing and able to provide for *Full Replacement* in case of a *Reversal* in accordance with the *Requirements* of this Section ER5 and shall include a *Representation* by the *Proponent Full Replacement Alternative Expert* that to the best of her/his/its knowledge and belief after a full, good faith investigation the information in the Report is accurate and complete in all material respects. The submission of such a Report shall be deemed an explicit

acceptance of the findings of the *Assigned Full Replacement Alternative Expert* as final, without right of further review or appeal.

A. *Full Replacement Alternative Report Requirements.*

1. All general data submitted shall be derived from recognized *Peer-reviewed Literature* or government datasets.
2. All statistical analyses shall use formulas and tests recognized as broadly valid in *Peer-reviewed Literature*.
3. All financial information shall be prepared in accordance with Generally Accepted Accounting Practices supported by documentation independently verified in writing by a *Financial Statement Preparer*.
4. Any references to legal constraints, legal enforcement mechanisms, or other legal aspects of the *Full Replacement Alternative* shall be supported by a *Legal Opinion* provided by a law firm retained by *Project Proponent* directly and explicitly confirming the accuracy of all information and interpretations.
5. A written statement from any third-party that is proposed as a participant in the *Full Replacement Alternative* confirming their willingness to participate as proposed and providing clear and convincing evidence of their capacity to carry out their proposed function.

B. Pursuant to Section A2, a *Public Comment Period* follows submission of the *Initial or Final Project Submission Documents* and pursuant to Section A5 a *Public Comment Period* follows submission of a *Verification Request*. Within 10 business days of the end of the *Public Comment Period*, all analyses and all comments posted shall be submitted to the *Assigned Full Replacement Alternative Expert*.

C. Within 30 days of submission to the *Assigned Full Replacement Alternative Expert*, the *Assigned Full Replacement Alternative Expert* shall issue its finding as to whether the evidence submitted by the *Project Proponent* is clear and convincing enough to assure *Full Replacement* by the *Project Proponent* in the event of a *Reversal*. The *Assigned Full*

Replacement Alternative Expert's finding shall be final, and the *Project Proponent* shall be bound by the *Assigned Full Replacement Alternative Expert's* finding.

ER5-9 “Reversals” Defined. The *RFS* defines the term *Reversal* as the voluntary, human-induced removal of *Tree Biomass* that had previously generated a verified *RFS Credit*. As described in the Rationale, removals, and thus *Reversals* can be human-induced or natural (e.g. fires started by lightning; natural disease). Human-induced removals can be voluntary (e.g. intentional harvesting) or involuntary (e.g. fires started by negligence; actively monitored and resisted illegal harvesting). The goal of *The RFS* is to change removal behavior and so the target of *The RFS Crediting* incentive system is voluntary human-induced removals. However, at times it has proved difficult to make unequivocal assessments of whether *Removals* are or are not human-induced and are or are not voluntary. The following rules attempt to strike a reasonable balance that assures *Project Proponents* and the public that when removals occur that are involuntary or natural the *Project Proponent* will not be penalized, and that when they are voluntary and human-induced they will be considered a *Reversal* requiring *Full Replacement*.

A. *Human-Induced vs. Natural Removals.* Fires in the *Project Area* due to intentional, slash-and-burn clearing for pasture or farmland purposes are treated as voluntary human-induced removals. It has been well-established that such fires can be difficult to distinguish from fires that are entirely accidental (Cochrane, 2000). However, there are several distinguishing features of human induced vs. accidental fires: intentionally cleared forest areas tend to have sharp, geometric edges and often expand existing pasture. Areas cleared by accidental fire tend to have more ragged edges and are often far from developed land. Another indication that fires are accidental is when burned areas begin to regrow shortly after they have been burned (http://earthobservatory.nasa.gov/Features/AmazonFire/amazon_fire3.php). Given the existence of strong indicators that can distinguish human-induced from accidental fires, *The RFS* allows *Projects* to claim that removals attributable to fire are accidental and not human-induced and that therefore they should not be treated as a *Reversal*. To

substantiate such a claim, the following protocol shall be followed and its *Requirements* complied with:

1. With each *Verification Request*, the *Project Proponent* shall submit:

(a) *Representations* by the *Project Proponent's* top executive officer (e.g., CEO, Principal Partner, Executive Director) in his or her personal capacity, as well as by the *Project Proponent*, that the removals due to burning identified in the Verification process are accidental and not human-induced to the best of his/her knowledge and belief after a full, good faith investigation. This *Representation* shall explicitly state:

- (i) whether the cause of the fire is known or unknown;
- (ii) how the *Project Proponent* has determined the fire is accidental;
- (iii) whether the *Project Proponent* has had any reports of the fire being intentionally set; and
- (iv) that the *Project Proponent* has not received a notice from any *Governmental Authority* or *Project Participant* that the fire may have been intentionally set.

(b) a *Natural Fire Report* from a *Proponent Forest Ecologist* that in her/his professional opinion the burning has the attributes of accidental rather than human-induced burning and that upon inquiry of *Governmental Authorities*, there are no credible reports of intentional slash-and-burn clearing activities that would account for the fires.

B. *Voluntary Vs. Involuntary Removals.* Human-induced removals that appear involuntary (e.g. illegal logging) may be interpreted as voluntary if the *Project Proponent* has approved or tolerated the removal. For example, for illegal logging to be viewed as entirely involuntary, the *Project Proponent* would be expected to have actively opposed the illegal logging by: (i) reporting in a timely fashion the activity to authorities legally charged with preventing it; (ii) posting the *Project Area* with notices that illegal logging would be prosecuted; (iii) taking steps to ensure that its personnel charged with

preventing illegal logging have been trained appropriately and warned of prosecution if they accepted any form of consideration for looking the other way; (iv) actively enlisting the cooperation of all *Project Participants* in preventing, monitoring, and reporting illegal logging; and (v) similar preventative measures, including a monitoring program. Admittedly, it can be difficult to distinguish voluntary from involuntary actions by the *Project Proponent* or other *Project Participants*. However, consistent with *The RFS's* commitment to assuring that *RFS Credits* act as incentives to achieve avoidable reductions, and given the existence of indicators that can be reasonably interpreted as evidence of involuntary removals, *The RFS* allows *Projects* to claim that removals are involuntary and that therefore they should not be treated as a *Reversal*. To substantiate such a claim, the following protocol shall be followed and its *Requirements* complied with:

1. With each *Verification Request*, the *Project Proponent* shall submit:

(a) *Representations* by the *Project Proponent's* top executive officer (e.g., CEO, Principal Partner, Executive Director) in his or her personal capacity as well as by the *Project Proponent* that a given removal was done without their participation or tolerance to the best of his/her knowledge and belief after a full, good faith investigation. This *Representation* shall explicitly state:

(i) the dates of the removal to the best of its knowledge;

(ii) whether the cause of the removal is known or unknown;

(iii) actions taken by the *Project Proponent* to prevent or avoid the removal, including the dates of such actions;

(iv) whether and when the *Project Proponent* had any reports of the actions leading to the removal;

(v) that the *Project Proponent* reported the actions leading to the removal, and the removal itself, to a *Governmental Authority* to prevent or punish the removal if illegal;

(vi) actions taken by the *Governmental Authority* to which *Project Proponent* reported the activity and removal; and

(vii) that they received no consideration, direct or indirect, from or on behalf of those who did the removal.

(b) an *Involuntary Removal Report* from a *Proponent Forest Ecologist* that in her/his professional opinion:

(1) The *Project Proponent* has substantially complied with ER5-10B(i)-(v);

(2) That the removals in question were done without the participation or tolerance of any *Project Participant*; and

(3) That upon inquiry of *Governmental Authorities*, there are no credible reports that any *Project Participant* participated or tolerated the removal in question.