Verified Carbon Standard

SUMMARY OF PUBLIC COMMENTS: PROPOSAL TO CREATE A LONG-TERM REVERSAL MONITORING SYSTEM

1 INTRODUCTION

Given concerns that have been raised about the long-term non-permanence risk of nature-based carbon credits, Verra is proposing developing a long-term reversal monitoring system (LTRMS) that will monitor VCS agriculture, forestry and other land use (AFOLU) projects for losses and reversals after their crediting periods end. From 15 December 2021 to 14 February 2022, Verra conducted a public consultation regarding the proposed approach to developing and implementing the LTRMS and the implications and impacts of its use for VCS AFOLU and nature-based carbon credits.

This document summarizes the main points of feedback received during the consultation. Verra received responses from 14 stakeholders, including project proponents, independent carbon market and technical experts, credit buyers, validation/verification Bodies (VVBs) and other key stakeholders. Verra is grateful for the feedback.

During the consultation, Verra sought input on the following questions:

1. Should Verra monitor VCS AFOLU projects for reversals during the post-crediting period? If so, why, if not, why not?
2. What would be the key opportunities, benefits, challenges, and risks of Verra doing this?
3. What types of VCS AFOLU projects could currently be monitored for reversals effectively and efficiently using available remote monitoring approaches? How are remote monitoring technologies expected to evolve in the near future, and should this enable monitoring for additional AFOLU project types and activities (e.g., degradation)? If so, which and by when?
4. Would the LTRMS and associated proposed periodic adjustments to the VCS withholding percentages (based on monitored losses by risk category) increase confidence in the long-term resilience of the AFOLU buffer pool and issued project credits?
5. Over how long a period should Verra monitor reversals after the project crediting period ends (e.g., 50 years, 100 years)?
6. How frequently should Verra aim to monitor for loss events (e.g., quarterly, bi-annually)?
7. If Verra ceases to operate or manage the LTRMS prior to the end of this monitoring commitment, how could environmental integrity be maintained (e.g., through the cancellation of all buffer credits associated with the project)?

8. What best practices, standards or guidance should the LTRMS follow? Are there potential limitations to the applicability, accuracy, reliability, and credibility of a remote monitoring approach for identifying AFOLU reversals?
9. What sort of oversight/quality assurance practices are necessary to ensure the LTRMS functions properly and that the identification and quantification of reversals in the post-crediting period is accurate?
10. What else should Verra keep in mind when considering how best to develop and implement a robust and workable LTRMS system?

Verra analyzed the responses to each of these questions as well as general comments and other questions received during the public consultation and webinar. A summary of the feedback received is presented here.

2 CONCLUSION

All commenters agreed with the purpose and intent of the proposal and that Verra should undertake long-term monitoring of VCS AFOLU credits. Commenters generally responded that it is feasible to monitor several types of nature-based solution (NBS) projects such as forests and agricultural land, and that the LTRMS would increase confidence in nature-based solutions and VCS AFOLU projects by providing data about non-permanence risk and reversals that could be used to ensure the integrity of the buffer. Commenters suggested that Verra should undertake monitoring for variable periods after crediting, with most suggestions being for 50-100 years. Most respondents agreed that annual reporting on reversals would be sufficient, given that there is no current requirement to monitor VCS AFOLU projects during the post-crediting period.

Key challenges identified by commenters included:

- The costs of developing and maintaining the system for up to 100 years;
- Technical challenges related to the detection and accurate quantification of various natural carbon stocks/changes in a wide range of natural ecosystems; and
- Increasing carbon stock losses due to climate change.

Commenters also raised questions about how Verra's monitoring system data would be compared with project monitoring during the crediting period and how reversals or post-crediting period baselines would be determined. At this stage, Verra plans to use LTRMS only during the post-crediting period and implement changes to the management of the VCS AFOLU buffer pool based on these data. The LTRMS will also ensure consistency, accuracy and transparency in the data and methods used to monitor loss events and estimate corresponding reversals in the post-crediting period.

3 SUMMARY OF COMMENTS

Additional details of the public comments and questions are presented in the summary table that follows.

Questions	Summary of Comments	Response to comments
1. Should Verra monitor VCS AFOLU projects for reversals during the post-crediting period?	All respondents agreed that Verra should undertake long-term reversal monitoring. Reasons for supporting monitoring included that it would increase confidence in VCS AFOLU projects and the VCS Standard, ensure permanence of a wide range of nature-based carbon credits, and potentially demonstrate the continued climate benefits of NBS past the end of the crediting period.	Thank you for the feedback.
2. What would be the key opportunities, benefits, challenges, and risks of Verra doing this?	Respondents identified the following opportunities, benefits, and challenges/risks for Verra monitoring reversals: **Opportunities:** Verra could use the latest science and technology to provide greater assurance/accuracy in tracking reversals in nature-based projects **Benefits:** Increased credibility of credits and NBS projects and integrity of non-permanence approach. Greater transparency and traceability of credits. Improves non-permanence risk management and credit withholding	**Challenges:** *Sustainability:* Verra would test a range of technologies and solutions to ensure the accuracy and efficiency of the monitoring system, including cost-effectiveness. *Reversal definitions*: Verra would first test the LTRMS system's ability to detect and then quantify reversals for projects within the crediting period, working with project proponents or VVBs to determine an appropriate methodology. Verra recognizes that loss events such as fires and natural disturbances detected by remote monitoring may not be net reversals from a project methods perspective.

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	Challenges: *Sustainability*: how will the LTRMS keep updated with technology changes and maintain consistency and accuracy? How will Verra pay for the LTRMS? *Reversal definitions:* How will the LTRMS determine reversals without project proponents (PPs) input to validate or verify events? Some forest types, like seasonally dry forests, have seasonal variability and complexity that make it challenging to detect reversals accurately. *Data reconciliation*: What happens when there is a difference between PP and LTRMS determination of reversals, whose data are given priority? What if the LTRMS determines lower carbon benefits from a project after credits are issued? *Baseline issues*: How will the LTRMS determine reversals for projects using dynamic baselines? *System limits:* Will the LTRMS going to monitor for sustainable development benefits in projects using labels like the Climate, Community and Biodiversity Standards (CCB) or Sustainable Development Verified Impact Standard (SD VISta)? or only carbon? *Other:* What is the liability of project proponents if reversals exceed buffer contributions in the post-crediting period? **Risks**: Climate change might increase reversal risk past mid-century, and more projects means potentially greater risk exposure. Non-linear feedbacks resulting	*Data reconciliation*: Verra would expect project proponents' monitoring and verification data to be higher quality than LTRMS data. Verra intends to test the remote monitoring approach against high-quality field-based monitoring in developing the system. The LTRMS would only be used to detect and quantify reversals in the post-crediting period when project proponents' are no longer monitoring. Therefore, conflicts are not expected. *Baselines:* Verra does not intend to use the LTRMS to assess carbon benefits from projects but instead would likely follow the baselines and assumptions used by PPs in assessing reversals. *Other:* Since the LTRMS would be mainly used for post-crediting period reversals, PPs are not currently required to compensate for those reversals. If project reversals exceeded project contributions to the buffer pool, other credits from the pool would be used to compensate for these reversals. **Risks:** Verra is currently working on modifying the AFOLU Non-Permanence Risk Tool for VCS projects to account for increased risks associated with climate change. For more information, please see the public consultation on that tool.

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	from climate change may accelerate reversals in some ecosystems, and climate risk needs to be accounted for in the non-permanence risk assessment	
3. What types of VCS AFOLU projects could currently be monitored for reversals effectively and efficiently using available remote monitoring approaches?	Most respondents said forest projects (avoided deforestation, ARR and IFM) are feasible to monitor with present remote sensing (RS) technology. Some suggested using national forest monitoring system info where available, and global datasets otherwise. Questions were raised about how Verra will test the accuracy of the monitoring data without PP or independent verifiers. *Forest projects*: While monitoring deforestation and major land use changes is currently feasible, finer-scale degradation losses and tree cover gain (for reforestation and agroforestry) are challenging for medium resolution RS. *Soil carbon*: While this is an active area of research, it is presently difficult to directly observe/monitor using remote sensing. Indirect methods (models) can be used to estimate soil or belowground carbon.	Verra agrees that forest projects would be the most feasible to monitor for loss events in the near term, and that other projects (e.g., agriculture, agroforestry, and soils) could be added once remote monitoring technologies improve.
4. Would the LTRMS and associated proposed periodic adjustments to the VCS withholding percentages (based on monitored losses by risk category) increase confidence in the long-term	All respondents agreed that this would increase confidence in credits and is a primary benefit of the LTRMS. One response suggested adding independent science/evidence to support the LTRMS and making data publicly available for transparency and credibility.	Verra plans to use data from the LTRMS to assess whether the AFOLU buffer pool has sufficient credits to insure against losses. If LTRMS data indicate that non-permanence risk is increasing, then Verra would have to consider increasing buffer contributions or other steps to ensure the overall permanence of NBS projects.

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resilience of the AFOLU buffer pool and issued project credits?	There was also support for stress-testing the AFOLU buffer periodically to ensure its solvency. *Questions:* Will withholding percentages be increased over time if climate change increases the non-permanence risk for NBS projects?	
5. Over how long a period should Verra monitor reversals after the project crediting period ends (e.g., 50 years, 100 years)?	Most respondents suggested that Verra monitor projects for either 50 or up to 100 years post-crediting, following the VCS Standard's definition for permanence, based on 100-year GWPs. Some responses suggested that the duration of long-term monitoring should be based upon scientific evidence, the project type and context, and the evolving consensus and guidance on permanence. This includes guidance from efforts like the Integrity Council on Voluntary Carbon Markets (ICVCM). There may also be alternative approaches like discount rates/tonne-year accounting that may make shorter periods of monitoring appropriate.	Thank you for the feedback; Verra will consider these suggestions.
6. How frequently should Verra aim to monitor for loss events (e.g., quarterly, bi-annually)?	Most respondents said annual or bi-annual monitoring would be sufficient, especially to account for seasonal variations for certain ecosystems. A few responses suggested periodic (5-10 years) monitoring to assess slow-moving reversals like tree mortality, and one suggestion to use higher frequency/near real-time data.	Thank you for the feedback; Verra will consider these suggestions.
7. If Verra ceases to operate or manage the LTRMS prior to the	A range of possible solutions were suggested, including transferring the projects to another program/standard or	Thank you for the feedback. Verra will explore these potential options.

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end of this monitoring commitment how could environmental integrity be maintained (e.g., through cancellation of all buffer credits associated with the project)?	a legal successor to manage the LTRMS, with government or international institutions providing a backstop. There may also be the possibility of an earth observation/RS company or NGO that could continue providing the LTRMS data. Other suggestions included using insurance products or reverting to the current approach of cancelling all AFOLU buffer pool credits.	
8. What best practices, standards or guidance should the LTRMS follow? Are there potential limitations to the applicability, accuracy, reliability, and credibility of a remote monitoring approach for identifying AFOLU reversals?	Several 'best practices' guidance documents, including Global Forest Observation Initiative's (GFOI) Methods and Guidance for Forest Monitoring, and other MRV guidelines, can be used. Respondents suggested combining different remote sensing modalities to reduce uncertainties and increase the accuracy of models and individual RS products. Further, it was suggested that Verra consider establishing a paired treatment/control experimental approach to monitoring projects for reversals. *Remote sensing limitations*: Various physical limitations to the spatial and temporal resolution or cloud cover might limit specific RS products. There may also be cost limitations (e.g., for purchasing high-resolution imagery or ground-based sampling) that need to be addressed. Last, keeping the LTRMS up to date with technological changes will require continuous investment by Verra. Other challenges for determining reversals relate to the types of baselines used in projects and reconciling differences between monitoring data from PPs and the LTRMS.	Thank you for the feedback; Verra will consider these suggestions. Thank you for the feedback; Verra will consider these suggestions.

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9. What sort of oversight/quality assurance practices are necessary to ensure the LTRMS functions properly and that the identification and quantification of reversals in the post-crediting period is accurate?	Transparent documentation of how the LTRMS functions and estimates reversals are necessary, potentially including making all relevant software code fully open source and freely available. There should also be reporting of the uncertainty and accuracy metrics of the LTRMS and periodic third-party oversight. Other best practices include independent expert validation and stakeholder consultation to assess the performance of the LTRMS in determining reversals.	Thank you for the feedback; Verra will consider these suggestions.
10. What else should Verra keep in mind when considering how best to develop and implement a robust and workable LTRMS?	Ease of use, flexible infrastructure, monitoring portal with APIs for 3rd party apps. There may be significant additional carbon accumulating in forests after the crediting period ends and up to year 100 that contributes to climate goals. One respondent suggested that Verra should clarify that purchasing carbon credits issued from projects that store carbon in natural ecosystems does not allow the buyer to make credible “offsetting” or “compensation” claims, because of the underlying impermanence risks of NBS compared to the long-term impacts of carbon emissions of fossil sources.	Thank you for the feedback; Verra will consider these suggestions. Please note that Verra recognizes that the residence time of carbon dioxide in the atmosphere is much longer than 100 years. Using 100-year global warming potentials and focusing on 100 years of permanence is a policy decision that was made by the broader GHG accounting community.