

# Enhanced Weathering in Closed Engineered Systems 1.0 Module

Public Consultation Summary

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## Context

Isometric held a public consultation on its Enhanced Weathering in Closed Engineered Systems v1.0 Module to receive stakeholder input on this Module.

The public consultation was announced on the 20th of June, 2025. The period of consultation lasted 30 days, with the final day as the 20th of July, 2025

After the initial public consultation, the feedback received was considered for incorporation into the Module. All stakeholders have received responses to the submitted feedback.

This document summarizes the feedback received during the public consultation and the revisions included as a result of the comments. Content in italics and brackets are excerpts from the public consultation version of the protocol to give the reader necessary context behind the comment.

We thank all participants for their time.

## Summary of feedback received

Section	Comment	Resolution
Enhanced Weathering in Closed Engineered Systems v1.0 Module		
General	Replace "dissolved inorganic carbon" with "Dissolved Inorganic Carbon"	[Changed]: Thank you for your comment, all relevant changes has been made
1.0 Introduction	Add "closed"	[Changed]: Thank you for your comment, revised
1.0 Introduction	Replace "an" with "a" and Add "closed"	[Changed]: Thank you for your comment, revised
1.0 Introduction	Replace "enhanced weathering" with "Enhanced Weathering"	[Changed]: Thank you for your comment, revised
1.0 Introduction	Add "(see chapter 3.0, Feedstock Characterization and Pre-Treatment)"	[Changed]: Thank you for your comment, revised

1.1 Project Types and Applicability	Replace "Containing" with "before or after the injection of "	[Changed]: Thank you for your comment, revised
1.1 Project Types and Applicability	Use "finally" instead of "eventually" to be more clear	[Changed]: Thank you for your comment, revised
1.1 Project Types and Applicability	<i>[The CO2 is not derived from a fossil fuel source]</i>  Comment 1: Why? What difference would it make  Comment 2: Why is that? We have the case of 44.01 in UAE and Oman.	[No change]: Thank you for your comment. A fossil fuel source would constitute an avoidance, which is not currently credited under the Isometric Standard. This module is designed for CO2 sources that constitute a net removal from the atmosphere.
1.1 Project Types and Applicability	<i>[Projects must discharge directly into the ocean from coastal outfalls, or to rivers and estuaries where the discharge will be transported to the ocean]</i>  What about the environmental impacts of large influxes of DIC? Can we be certain it is safe? Are we certain that CO2 will not be re-released from the river systems before it reaches the ocean?	[No change]: Thank you for the comment. Projects must obtain official permitting for fluid discharge and meet the permitted limits for water quality. Typically, this involves a pH limit on the fluid discharge to ensure safety for aquatic life. Please see Section 6: Environmental and Social Safeguarding for more details on risk mitigation and monitoring. Regarding re-release of CO2, only DIC which is stably stored in seawater is credited. Any losses during river transport or upon equilibration with the ocean will be deducted from the gross removal. For more information, please see Section 4.1.3.4: Transport Losses.
1.1 Project Types and Applicability	<i>[CO2 is stored in the aqueous phase as DIC]</i>  Why not mineralized?	[No change]: Thank you for your comment, this Module focuses on aqueous DIC storage resulting from weathering of alkaline feedstock, rather than solid mineral precipitation. For mineralised storage please refer to the CO2 Storage via Ex Situ Mineralization in Closed Engineered Systems Module on our registry
1.1 Project Types and Applicability	<i>[Concentrated CO2 is introduced to a reactor containing alkaline feedstock;]</i>  Is concentrated CO2 an extra step creating emissions and additional	[Changed]: Thank you for your comment, we have changed our writing in the Module to the following: "CO2 (from eligible sources listed below) is

	costs? Any further details on the concentration step?	introduced to a reactor containing alkaline feedstock" The following text has a list of eligible sources including (Direct Air Capture (DAC), Biogenic CO2 Capture (BCC), Direct Ocean Capture (DOC))
1.1 Project Types and Applicability	<i>[Most rivers will reach their basin outlet within one to two months.]</i>  Reference?	[Changed]: Thank you for your comment. The following reference has been added: Allen, G. H., David, C. H., Andreadis, K. M., Hossain, F., & Famiglietti, J. S. (2018). Global estimates of river flow wave travel times and implications for low-latency satellite data. Geophysical Research Letters, 45, 7551–7560. <a href="https://doi.org/10.1029/2018GL077914">https://doi.org/10.1029/2018GL077914</a> ↵
1.1 Project Types and Applicability	<i>[Long term storage in inland waters (e.g. lakes) will be explored for future iterations.]</i>  Increased DIC concentrations in low flow waters might disturb the biodiversity, such as shifts in community composition. Also, heavy metal concentrations in the effluent must be considered.	[No change]: Thank you for the comment. Permitted limits and safety thresholds for discharge concentrations must consider the receiving waters dilution capacity. Please see the Section 6 Environmental and Social Safeguarding for more details.
1.1 Project Types and Applicability	CO2 degassing in rivers or lakes should be considered as a risk for reversal.	[No Change] Thank you for the comment, CO2 degassing from rivers or lakes is considered as risk of reversal, refer to section 4.1.3.3 and section 4.1.3.4
2.1 Reactor Design Requirement	This requires CO2 sensors at the inlet and outlet, I assume in the gas phase. This can also be measured by an increase in DIC in the water, and since that accounts for conversion to DIC, that could be more reliable. For example, measuring TA and PCO2 or pH at the inlet water and outlet water would allow for an accurate DIC calculation.	[No Change] Thank you for your comment -- we will address this comment assuming it was intended for Section 2.3 (CO2 and Feedstock Loss). This section requires monitoring of inflow and outflow of CO2 from the reactor, which does not necessarily require a CO2 sensor. This can be done using carbonic acid system measurements. We do, however, recommend that this is a continuous measurement where possible (e.g. pH + pCO2 sensors) to ensure that the system is continuously monitored.
2.2 Design Diagram Requirements	The discharging system should follow guidelines and best practices similar to these of sewage treatment works	[Changed]: Thank you for highlighting the importance of following established best practices for discharge systems. Proper design of effluent discharge systems is critical for environmental protection and regulatory compliance. However, enhanced weathering projects may

		<p>have different discharge characteristics and regulatory requirements compared to sewage treatment works. We have added broader language that encompasses best practices across various industrial discharge applications while ensuring regulatory compliance.</p> <p>The following text has been added to this section: "Discharge system design must follow applicable regulatory requirements and industry best practices for effluent management, including appropriate diffusion, mixing, and monitoring infrastructure as required by discharge permits. "</p>
2.3 CO2 and Feedstock Loss	<p><i>[Where chemical kinetics are derived from in-house experimental measurements, details of the experimental procedure used to perform these measurements should be included in the PDD.]</i></p> <p>Comment 1: Adding oxi tops and carbitops methods for measuring O2 and CO2 consumption rates would be very useful for modeling.</p> <p><a href="https://www.imwa.info/docs/imwa2023/IMWA2023Shiimi_471.pdf">https://www.imwa.info/docs/imwa2023/IMWA2023Shiimi_471.pdf</a></p> <p><a href="https://www.imwa.info/docs/imwa2025/IMWA2025Clancy_195.pdf">https://www.imwa.info/docs/imwa2025/IMWA2025Clancy_195.pdf</a></p> <p>Comment 2: Oxi/carbitops can be used here to derive the chemical kinetics of the experiment</p>	<p>[No Change]: Thank you for your comment. We choose not to mandate certain measurement methods to ensure that the module can be applied in diverse project settings. Projects may choose to use these methods, provided that detailed experimental methods are described in the PDD to ensure proper implementation. We'd love to review the papers you mentioned to better understand the methodology - unfortunately, the links don't seem to be accessible on our end.</p>
2.3 CO2 and Feedstock Loss	<p><i>[Only CO2 which has been determined by this calculation to be in the form of DIC through reaction with rock or mineral feedstock is eligible for carbon Credits under this Module.]</i></p> <p>What is the fate of the other carbon fractions?</p>	<p>[No Change]: Thank you for your comment, for clarification: the other fraction will be the CO2 that is lost and will not be used for crediting</p>
2.3 CO2 and Feedstock Loss	<p><i>[Overall on section 2.3]</i> It is unclear why a kinetics model needs to be included if real-time measurements are taken of the CO2 uptake and conversion to bicarbonate.</p>	<p>[No Change]: Thank you for your comment. Under this module, modeling is only required when direct measurements are not feasible.</p>

	<p>Also, mineral feedstock loss is an economic concern for the CDR company, but will not impact CO<sub>2</sub> uptake and conversion calculations since those will be measured through continuous TA and pH/PCO<sub>2</sub>. If it is listed as a potential quantification method,</p>	<p>Regarding feedstock loss: feedstock loss characterization is necessary for several reasons:</p> <p>Mass balance verification: Lost feedstock represents material that exits the reactor before it can react with CO<sub>2</sub>, affecting overall system efficiency calculations.</p> <p>Conversion efficiency: Understanding feedstock loss is essential for accurately calculating conversion rates and residence times within the reactor.</p> <p>System optimization: Feedstock loss affects the actual amount of reactive material available in the reactor at any given time.</p> <p>Potential CO<sub>2</sub> storage: Lost feedstock represents unreacted capacity that could have stored additional CO<sub>2</sub>.</p> <p>Note that the protocol only requires feedstock loss characterization 'in applicable systems' where this is a risk (such as fluidized bed reactors), not for all reactor designs. This requirement ensures accurate system performance characterization and mass balance calculations, which are essential for proper carbon accounting even when direct carbonate measurements are available.</p>
2.4 Construction Considerations	<p><i>[It is anticipated that operation of the chemical reactor may occur at high temperature and pressure, and that the pH inside the reactor may be acidic.]</i></p> <p>In the introduction is mentioned that "Elevated temperature and pressure are not required in enhanced weathering in engineered systems because dissolution of alkaline rock is not kinetically inhibited at ambient temperature and pressure conditions". Please clarify.</p>	<p>[Changed]</p> <p>Thank you for your comment. We have corrected to clarify that this is true in some cases, not all.</p>
3.0 Feedstock Characterization and Pre-treatment	<p><i>[Some Project Proponents may choose to pre-treat their feedstock to increase reactivity. Methods of pre-treatment may include, but are not limited to:]</i></p> <p>Additional emissions during pre-treatment should be considered and calculated.</p>	<p>[Changed]:</p> <p>Thank you for your comment. We have updated our writing to make the requirement accounting for additional emissions more clear.</p> <p>revised writing: added after the last sentence "Additionally, all emissions associated with pre-treatment processes, including energy consumption during thermal activation, chemical production and use during acid treatment,</p>

		and any other process-related emissions, must be considered and calculated as part of the project's overall GHG accounting."
3.0 Feedstock Characterization and Pre-treatment	<p><i>[If carbonate minerals are present in the feedstock prior to pre-treating, Project Proponents are required to characterize the mass of carbon potentially lost during heating and include this in calculations of GHG emissions related to project activities.]</i></p> <p>This is a critical part of the MRV and further guidelines on the CO2 content of the feedstock should be provided. A combination of Electron Microscopy techniques and Loss on Ignition is highly suggested.</p>	<p>[No Change]:</p> <p>Thank you for the comment. Further detail is provided in the Rock and Mineral Feedstock Characterisation Module, which is referenced here. The Module details the key physical and geochemical characteristic requirements of rock and mineral feedstocks for CDR projects to ensure safety and suitability for carbon removal.</p>
4.1 Calculation of CO2eRemoval	<p><i>[Emissions, RP is the total quantity of GHG emissions from project activities for a Reporting Period, in tonnes of CO2e.]</i></p> <p>Does this include comminution, transport and pre-treatment emissions?</p>	<p>[No Change]:</p> <p>Thank you for your comment, Yes, CO2eEmissions, RP includes comminution, transport, and pre-treatment emissions associated with feedstock preparation and handling. The total greenhouse gas emissions calculation encompasses all emissions associated with the project, including:</p> <p>Feedstock comminution (crushing/grinding)  Transport of materials to the project site  Pre-treatment processes  Reactor operations and monitoring</p> <p>Detailed equations and calculation requirements for these emissions are provided in the relevant supporting protocols in section 1.1, 4.1.5 and section 3</p>
4.1 Calculation of CO2eRemoval	<p><i>[CO2eCounterfactual, RP is the total CO2 removed from the atmosphere and permanently stored in the baseline scenario for a given RP, in tonnes CO2e. This is the amount of inorganic carbon that would be stored in a given feedstock across the lifetime of a Credit as a result of natural weathering.]</i></p> <p>It is quite unclear what is the baseline scenario in closed engineered systems. Is passive carbonation of the feedstock considered as counterfactual or carbonation is considered as natural CO2 content occurring at the feedstock</p>	<p>[No change]:</p> <p>Thank you for your comment. To clarify: the counterfactual refers to passive carbonation - the CO2 that would be captured from the atmosphere through natural weathering processes if the feedstock were left undisturbed over time. This is not the natural CO2 content already present in the feedstock material. This is described in Section 4.1.4. Baseline scenario: In the absence of the enhanced weathering project, the feedstock would undergo slow, natural weathering when exposed to environmental conditions (rain, groundwater, atmospheric CO2). This passive process would gradually capture some CO2 from the atmosphere and convert it to stable</p>

	material?	carbonate minerals. Counterfactual calculation: We subtract this natural CO <sub>2</sub> capture that would occur anyway to ensure we only claim credit for the additional CO <sub>2</sub> removal achieved through the enhanced weathering intervention.
4.1.2 Calculation of CO <sub>2</sub> eWeathered, Eff-Inf, RP	Error in the numbering of the equations: one goes from equation 2 to 4 without a third equation	[Changed]: Thank you for your comment and noted our error, revised
4.1.2 Calculation of CO <sub>2</sub> eWeathered, Eff-Inf, RP	<i>[Project Proponents are required to submit mass balance calculations consisting of both cation and carbonic acid system measurements to demonstrate that their calculations are not impacted by degassing.]</i>  It is very likely that both methods will produce different results. How do you deal with this in the formulae calculations? Is there some kind of normalisation and harmonisation taking place?	[Changed]: Thank you for your comment. It has been specified that these measurements need to align within the more conservative of 3 SD from the mean or 5% error and that an audit by Isometric will be triggered if they do not.
4.1.2 Calculation of CO <sub>2</sub> eWeathered, Eff-Inf, RP	<i>[direct fluid measurements of the influent and effluent]</i>  Each sample should be collected using a syringe with an attached 0.45 µm sterile and endotoxin free filter and then placed into acid washed (10% HCl) HDPE (high density polyethylene) plastic bottle and stored at 4 oC. Samples should be placed in a cold box to be moved from site and be stored in a fridge at 4oC in the dark, before sent to a lab for chemical analysis. Analysis should ideally be carried out in less than 24h after the sample collection, to avoid potential contamination. For nutrient analysis, filtration conducted using 0.45 µm cellulose membrane filters is needed for the particulate matter to be removed. You also need to ensure that duplicate samples and blanks are run during batch analysis to check for potential contamination and increase accuracy.	[No Change]: Thank you for your comment. We avoid prescribing a specific sampling approach within this module. Project Proponents are required to describe their sampling approach in detail in the Project Design Document to ensure suitability for the specific project conditions. This is evaluated by the VVB and Isometric during the validation phase.
4.1.3.1 CO <sub>2</sub> eLosses,RP where CO <sub>2</sub> eWeathered,R	<i>[CO<sub>2</sub>eMisc,RP is the amount of captured CO<sub>2</sub> lost as a result of other processes than those listed above, such as the formation of secondary</i>	[No Change]: Secondary mineral precipitation here refers to any secondary minerals that may be formed during the reaction process. Discrepancies



P is calculated from cation measurements	<p><i>minerals, over a Reporting Period.]</i></p> <p>Is secondary mineral precipitation going to be determined using saturation indices? Given that these will be very small crystals or even unstable sorbed phases in particulate river sediments, how the potential redissolution and degassing is going to be addressed?</p>	between CDR calculated from carbonic acid system parameters and CDR calculated from cation concentrations may be attributed to this term. Secondary mineral formation downstream is accounted for in the downstream losses term.
4.1.3.1 CO <sub>2</sub> eLosses,RP where CO <sub>2</sub> eWeathered,R P is calculated from cation measurements	<p><i>[Non-carbonic acid weathering can be calculated by the difference between anion concentrations in influent and effluent streams:]</i></p> <p>Comment 1: includes weathering by sulphuric acid -&gt; a place to insert the oxitop method as this quantifies sulphide oxidation and subsequent co<sub>2</sub> release</p> <p>Comment 2: Data on nitric and organic acids in the effluent can be collected through monitoring and collecting nearby land use data, but for the sulphuric acid determination and CO<sub>2</sub> release, the use of oxitop and carbitop methods would be very useful.</p>	<p>[Changed]: Thank you for your comment. This is useful information, we choose not to mandate certain measurement methods to ensure that the module can be applied in diverse project settings. Projects may choose to use these methods, provided that detailed experimental methods are described in the PDD to ensure proper implementation.</p>
4.1.3.3 Calculation of Downstream Losses	Also requires an extra and unknown budget for research.	<p>[No Change]: Thank you for your comment, this is also noted and revisions have been made to the relevant text in the Module. Note that this approach is recommended rather than required.</p>
4.1.3.3 Calculation of Downstream Losses	<p><i>[Calculation of Downstream Losses]</i></p> <p>This is very challenging in terms of MRV, heavily relied upon journal papers and modeling, especially for the far field zone in both open and closed systems enhanced weathering. The conservative upper limit loss approach is good, but vague. More information is needed on this part.</p>	<p>[No Change]: Thank you for the comment. This is indeed a source of uncertainty compared to other aspects of the system that are directly observable within a control volume. Furthermore, we expect the treatment of these losses to depend on site-specific factors which dictate the relative risk of downstream losses. We will continue to update guidance in this section with the latest scientific advances.</p>
4.1.3.3 Calculation of Downstream Losses	<i>[Project Proponents are recommended to conduct research on these potential losses in the relevant carbonate chemistry parameter space for their specific process.]</i>	<p>[No Change] Thank you for the comment. The subsequent sections of the protocol include recommended approaches to quantifying or avoiding each of the required loss terms. In</p>

	<p>This is a very honest and correct statement, but might sound a bit discouraging for potential clients interested in adopting this protocol. If the uncertainty is high, it will be a barrier.</p>	<p>the absence of site-specific research, conservative estimates based on existing studies can be used.</p>
<p>4.1.3.3.2 Re-equilibration of DIC</p>	<p><i>[Re-equilibration of DIC]</i></p> <p>site and project specific</p>	<p>[Changed]: Thank you for the feedback, here is what we have revised in the Module:</p> <p>After Equation 12: we added "The extent and rate of re-equilibration are highly site and project specific, depending on local water chemistry, hydrodynamic conditions, and effluent characteristics"</p>
<p>4.1.3.3.2 Re-equilibration of DIC</p>	<p><i>[Two endmember mixing model to estimate the DIC of the effluent and ambient water mixture.]</i></p> <p>These models will indicate what will be out of equilibrium, but they will not necessarily identify kinetic barriers (ie it can be further diluted before the back reaction takes place). This may mean an overestimate of outgassing/precipitation. This can be tested with lab experiments to reduce uncertainty.</p>	<p>[No Change]: Thank you for the comment. It is true that the proposed model will represent a conservative estimate of outgassing and does not consider the effects of kinetics. Alternate models which represent kinetics and/or using laboratory experiments is also acceptable.</p>
<p>4.1.3.3.2 Re-equilibration of DIC</p>	<p><i>[Equilibrium speciation of DIC is primarily dependent on pH, and to a lesser extent temperature, salinity and pressure:]</i></p> <p>Also the surrounding land use and the chemistry of run offs. Is nearby a farm, a sewage treatment work, and industrial zone, a fishery, a habitat? And what are the allowed freshwater quality thresholds?</p>	<p>[No Change]: Thank you for the comment. It is true that other water quality parameters such as metals concentrations or dissolved organic matter may influence DIC speciation, pH is the most critical parameter. For more details on thresholds for monitored parameters prior to discharge (safety thresholds) and in the receiving environment (action thresholds), please see Section 6: Environmental and Social Safeguarding.</p>
<p>4.1.3.3.2 Re-equilibration of DIC</p>	<p><i>[The difference between the measured DIC of the effluent and DIC of the mixture is the outgassing loss.]</i></p> <p>Please check the Redfield ratios.</p>	<p>[No Change]: Thank you for the comment. In this context, outgassing loss is quantified based on physical mixing, and this does assume that primary production is not significantly perturbed by the project activity. However, we will revisit this if emerging research suggests that biological uptake becomes relevant for quantifying the outgassing loss.</p>
<p>4.1.3.3.3 Carbonate</p>	<p><i>[Continuous monitoring of carbonate</i></p>	<p>[No Change]:</p>

Precipitation	<p><i>chemistry variables and TSS is recommended to ensure that conditions for secondary precipitation are avoided]</i></p> <p>How? Please provide more details.</p>	<p>Thank you for your comment. This recommendation refers to installation of sensors that capture the system chemistry at regular, frequent intervals. This allows monitoring of various parameters, such as pH and pCO<sub>2</sub>, that may facilitate secondary mineral formation.</p>
4.1.3.3.3 Carbonate Precipitation	<p><i>[Calcium carbonate precipitation may result in a reduction in carbon loss by 50% for non-carbonate feedstocks or 100% for carbonate feedstocks.]</i></p> <p>Comment 1: Reference?</p> <p>Comment 2: Citation?</p>	<p>[No Change]:</p> <p>Thank you for your comment. This is based on the stoichiometry of the reaction:  <math display="block">\text{Ca}^{2+} + 2\text{HCO}_3^- \rightarrow \text{CaCO}_3 + \text{H}_2\text{O} + \text{CO}_2</math> In this reaction, for every 2 moles of DIC (HCO<sub>3</sub><sup>-</sup>), 1 mole forms CaCO<sub>3</sub> and one mole forms CO<sub>2</sub>. Thus, this constitutes a 50% loss of DIC.</p>
4.1.3.3.4 Natural Alkalinity Flux Reduction	<p><i>[If this risk cannot be avoided, then additional monitoring or modeling is needed to assess the likely impact.]</i></p> <p>If this risk cannot be avoided, the project will probably face significant issues with the regulatory authorities.</p>	<p>[Changed]:</p> <p>Thank you for your comment, we agree that this is an important concern. The module has been updated to provide more specific guidelines and the following changes has been made to the Module:</p> <p>A recommended avoidance strategy is to limit accumulation of alkalinity on the river or sea bed through careful design of discharge rates. If this risk cannot be avoided, potential approaches should be adopted by Project Proponent include:</p> <ol style="list-style-type: none"> <li>1. Conduct early consultation with relevant regulatory authorities to establish acceptable monitoring and assessment approaches;</li> <li>2. Implement quantitative assessment through one or more of the following methods: <ul style="list-style-type: none"> <li>- Numerical modeling of particle transport and alkalinity distribution in receiving waters</li> <li>- Regular sediment sampling and chemical analysis at discharge points and reference sites</li> <li>- Direct measurement of benthic alkalinity fluxes using chamber or eddy correlation techniques</li> </ul> </li> <li>3. Develop monitoring plans that demonstrate compliance with applicable water quality standards and environmental regulations"</li> </ol>
4.1.3.3.5 Changes in Biotic Calcification	<p><i>[A recommended avoidance strategy is setting thresholds on pH and TA based on what has been shown in previous studies to have no significant increase</i></p>	<p>[No Change]</p> <p>Thank you for the comment. It is also our hope that alkalinity enhancing practices can benefit local ecosystems. Ultimately, this Module</p>

	<p><i>in biologically produced CaCO<sub>3</sub></i><sup>42]</sup></p> <p>This is an interesting tradeoff. In areas with lower pH due to increasing atmospheric CO<sub>2</sub> and a higher influx of ice melt water, calcifying species (e.g. lobsters and oysters) are struggling due to the corrosive nature of the water to their shells. It is our hope that increasing alkalinity will increase their growth rates and harden their shells, but this could come with a greater deduction in credit for carbon capture. This is a philosophical discussion that is worth having.</p>	<p>quantifies the net atmospheric carbon removal which means that potential changes to atmospheric carbon fluxes imposed by increases in biotic calcification must be represented for robust accounting. Due to the nascency and non-linearity of biological feedback systems, we have proposed a recommended avoidance strategy to mitigate risks of significant increases in biotic calcification. We will revisit this as scientific understanding evolves.</p>
4.1.3.4 Transport Losses	<p><i>[Project Proponents must quantify a loss discount for both re-equilibration and precipitation along rivers and upon entering the ocean.]</i></p> <p>If quantification is carried out through modelling, then more information on the model and the datasets are needed, as well as the transport modelling timescales. For projects in the UK and the EU, there are long-term freshwater and groundwater health status datasets and models used by the regulators under the Water Framework Directive (2000/60/EC) and the Groundwater Directive (2006/118/EC).</p>	<p>[Changed]: Thank you for the comment regarding modeling requirements and regulatory datasets for transport loss quantification.</p> <p>We have added the following text to this section of the Module but also want to emphasize that entire section of 4.1.3.4 is about how to quantify transport loss and if modelling is adopted what are the requirements</p> <p>"Where quantification is carried out through modeling approaches, Project Proponents must provide detailed information on the model selection, input datasets, validation approaches, and relevant transport modeling timescales. For projects in the UK and EU, Project Proponents should utilize existing long-term freshwater and groundwater health status datasets and models developed under the Water Framework Directive (2000/60/EC) and the Groundwater Directive (2006/118/EC) where applicable, and demonstrate how these regulatory frameworks inform their transport loss assessments."</p>
4.1.3.4.1 Outgassing During River Transport	<p><i>[When <math>Slc &gt; 0</math>, a river is considered supersaturated. Although supersaturation with respect to calcium carbonate does not necessarily result in calcium carbonate precipitation, typically, calcium carbonate precipitation is predicted at a <math>Slc &gt; 1</math>]</i></p> <p>This is heavily dependent on kinetics</p>	<p>[Changed]: Thank you for this comment. The threshold of <math>Slc &gt; 1</math> is a reference threshold in the absence of additional information. We have updated this text accordingly to make it clear that additional site specific information, including lab experiments with local or representative water samples, can be used to bolster predictions of precipitation risk during river transport.</p>

	and other elements present (e.g. Mg <sup>2+</sup> ), which can inhibit precipitation. Papers out of GEOMAR and Univ. of Hamberg have shown that very high saturation states can exist where no precipitation (or significantly delayed precipitation) occurs. This makes it more difficult to quantify, but the models should be paired with lab experiments to provide good estimates of the likely precipitation.	
4.1.3.4.2 Outgassing Upon Entering Ocean	<p><i>[Typically, the ocean has a higher pH than rivers, which shifts the carbonate equilibrium towards a higher proportion of CO<sub>3</sub><sup>2-</sup> in oceans.]</i></p> <p>Also of note, that mixing two waters in equilibrium with respect to calcite results in a water that is undersaturated with respect to calcite.</p>	<p>[Changed]: Thank you for your comment, we have made the following changes to the text</p> <p>"In addition, changes in salinity and saturation state upon reaching the ocean, as well as mixing-induced calcite undersaturation that occurs when waters in carbonate equilibrium are combined, can lead to calcium carbonate precipitation or dissolution."</p>
4.1.4 Calculation of CO <sub>2</sub> eCounterfactual,RP	<p><i>[without project intervention]</i></p> <p>What specifically constitutes as 'project intervention'?</p>	<p>[Changed]: Thank you for your comment, we have revised the Module and added the following text to section 4.1.4:</p> <p>"Project intervention refers to any active measures taken by the Project that accelerate or modify the natural weathering process, including extracting feedstock from its original location, processing it (crushing, grinding), placing it in engineered systems, and controlling environmental conditions beyond natural ambient levels."</p>
4.1.4 Calculation of CO <sub>2</sub> eCounterfactual,RP	<p><i>[If additional information on the conditions and duration of feedstock storage are available, Project Proponents may justify calculating the counterfactual across a time period relevant to the specific mine or quarry from which the feedstock is sourced in the PDD.]</i></p> <p>It is more realistic to calculate counterfactual in realistic mine closure timescales of 100 years. It is not likely that the feedstock will remain undisturbed for +1000 years.</p>	<p>[No change]: Thank you for the comment, The 1,000-year default timeframe is set to align with the durability definition of the Credit itself, ensuring consistency across the carbon removal quantification. Importantly, the protocol already provides the flexibility you're suggesting - Project Proponents can justify shorter timeframes (such as 100 years) based on site-specific documentation such as mine closure plans, regulatory requirements, or expected site management practices. The key requirement is that any deviation from the 1,000-year default must be supported by sufficient documentation in the PDD. This approach maintains scientific rigor while allowing for realistic project-specific</p>

		conditions.
4.1.6.1 Discharge of Undissolved Alkalinity	<p><i>[Any undissolved feedstock which is released in the effluent as TSS may dissolve in the open environment depending on local saturation states and enhance alkalinity in the receiving water body.]</i></p> <p>It would be preferable that the reactor is containing filters for the effluent. So any undissolved material could be reloaded in the reactor or safely stored as waste or by-product based on the chemistry of the filtered residue.</p>	<p>[Changed]</p> <p>Thank you for the comment, we have added the following text to this section of the Module:</p> <p>"It would be preferable that reactor design could incorporate appropriate filtration or solids separation systems to prevent discharge of undissolved feedstock. Separated solids may be recycled to the reactor for further processing or managed as waste/byproduct according to their chemical composition and applicable regulations. "</p>
4.1.6.2 Biological Fertilization	<p><i>[The release of elements (such as iron, silica, nitrogen and phosphorus) and DIC-enriched waters could lead to increases in primary production or changes in phytoplankton community structure, which may have a broader impact on biological carbon export.]</i></p> <p>See previous comments on Water Framework Directive, EU Urban Waste Water Treatment Directive (91/271/EEC), Natura 2000 sites including Special Areas of Conservation and Special Protection Areas under EU Habitats Directive (92/43/EEC), Sites of Special Scientific Interest designated under UK Act of the Parliament, or similar regulations in other non-EU/UK countries.</p>	<p>[Changed]</p> <p>Thank you for your comment, we have made the changes to the text to address this comment</p> <p>"Project Proponents must select alkaline feedstocks which minimize the risk of fertilization and ensure effluent concentrations of key nutrients comply with applicable regulatory frameworks including the EU Urban Waste Water Treatment Directive (91/271/EEC), Water Framework Directive (2000/60/EC), Habitats Directive (92/43/EEC) for Natura 2000 sites, UK Sites of Special Scientific Interest designations, and equivalent regulations in other jurisdictions. Nutrient sampling and analysis must follow established standard methods as outlined in relevant scientific literature and regulatory guidance."</p>
4.1.6.2 Biological Fertilization	<p><i>[Project Proponents must select alkaline feedstocks which minimize the risk of fertilization and ensure effluent concentrations of key nutrients are not increased beyond the standard range for the wastewater treatment plant.]</i></p> <p>A list of sampling and testing methods can be found in this paper:</p> <p><a href="https://www.sciencedirect.com/science/article/pii/S0048969722011974#bb0440">https://www.sciencedirect.com/science/article/pii/S0048969722011974#bb0440</a></p>	<p>[Changed]</p> <p>Thank you for the comment, and note that this comment is addressed together with the previous one. The literature reference has been added to the text in this section and the following changes are made to the text:</p> <p>"Project Proponents must select alkaline feedstocks which minimize the risk of fertilization and ensure effluent concentrations of key nutrients comply with applicable regulatory frameworks including the EU Urban Waste Water Treatment Directive (91/271/EEC), Water Framework Directive (2000/60/EC), Habitats Directive (92/43/EEC) for Natura 2000 sites, UK Sites of Special Scientific Interest designations,</p>

		and equivalent regulations in other jurisdictions. Nutrient sampling and analysis must follow established standard methods as outlined in relevant scientific literature and regulatory guidance."
5.1 Fluid measurements	<p><i>[Where applicable, analytical methods must be cross-referenced with an appropriate standard (e.g. ISO, EN, BSI, ASTM, EPA) or standard operating procedure.]</i></p> <p>Or protocols that are in line with the methodologies followed by the regulators. See previous comment and the paper.</p>	<p>[Changed]:</p> <p>Thank you for this important feedback. We agree that alignment with regulatory methodologies is crucial for project implementation and compliance. We have revised the language in the Module.</p> <p>"Where applicable, analytical methods must be cross-referenced with an appropriate standard (e.g. ISO, EN, BSI, ASTM, EPA) or regulatory protocol/methodology as required by relevant jurisdictional authorities. Where a project utilizes a non-standardized methodology or SOP for the determination of a listed parameter, the Project Proponent is required to outline the relevant method within the Project Design Document (PDD) submitted to the VBB, including demonstration of compliance with applicable regulatory requirements."</p>
5.1.1 Baseline Characterization	<p><i>[Project Proponents using direct measurements must provide details of their baseline sampling plan and describe how the chosen sampling frequency is appropriate for capturing any significant variation in concentration in the water source.]</i></p> <p>This is critical for the scalability of a project, plus the successful request for project permissions and environmental permits. Would be good for this protocol to include a stepwise guide for actions for project developers. A specific plan for baseline and losses is probably key for minimising risks and increasing the success rate of a new project.</p>	<p>[Changed]:</p> <p>Thank you for your comment, the following section has been added to the text of Baseline Characterization section:</p> <p>"At minimum, baseline sampling plans should include: (1) sampling frequency that captures all applicable (e.g., seasonal) variations, (2) additional sampling during known high-variability periods (e.g., storm events, industrial discharge cycles), (3) statistical justification for sampling frequency based on preliminary variability assessment, and (4) contingency sampling protocols if initial results show higher variability than expected. For water sources with well-documented historical data, Project Proponents may justify reduced sampling frequencies by demonstrating that existing data adequately characterises temporal variability."</p>
5.1.1 Baseline Characterization	<i>[To conservatively calculate weathering that occurs as a result of non-carbonic acid, Project Proponents choosing to substitute this data for measurements must assume that all non-carbonic acid present in the fluid will react with</i>	<p>[No Change]:</p> <p>Thank you for your comment:</p> <p>While mesocosm experiments could provide useful data, they assume static influent conditions and cannot account for the natural variability in fluid composition that occurs in</p>

	<p><i>feedstock.]</i></p> <p>This assumption can be avoided by mesocosm experiments, using the same feedstock and influent, simulating the reactor conditions, prior to large scale deployment.</p>	<p>real-world operations. The conservative assumption that all non-carbonic acid will react with feedstock remains necessary to ensure accurate carbon accounting given that influent chemistry can vary significantly over time due to seasonal changes, operational variations, and changes in source water composition. We encourage Project Proponents to conduct mesocosm experiments using influent water and chosen feedstocks to gain further understanding of the system in which they are working, but this data cannot be substituted for direct measurements at this time.</p>
5.1.1 Baseline Characterization	<p><i>[Non-carbonic acid concentrations must be measured as major anions in the water source, including NO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup>, PO<sub>4</sub><sup>3-</sup>, SO<sub>4</sub><sup>2-</sup> and any other anions relevant to the specific fluid and feedstock used.]</i></p> <p>See previous comments on water chemistry, sampling and suggested methods of analysis.</p>	<p>[No Change]:</p> <p>Thank you for your comment. Requiring both analytical methods would significantly increase costs and potentially limit protocol adoption by smaller projects. We believe the current approach provides necessary environmental protection while maintaining practical feasibility.</p>
5.1.1 Baseline Characterization	<p><i>[The concentration of non-carbonic acid in the source fluid must be reported in the PDD. Project Proponents are strongly encouraged to calculate the expected losses related to non-carbonic acid and compare this value to the expected CO<sub>2</sub> storage based on feedstock characteristics to ensure that the water source is suitable for the Project.]</i></p> <p>Again, this requires a significant amount of R&amp;D work through small scale experiments prior to deployment.</p>	<p>[No Change]:</p> <p>Thank you for the comment, we think this is essential for accurate carbon accounting since non-carbonic acids can significantly impact weathering efficiency. The protocol balances this by requiring basic water chemistry reporting while making loss calculations "strongly encouraged" rather than mandatory. This allows Project Proponents to assess whether additional experimental work is justified based on initial analysis.</p>
5.1.1 Baseline Characterization	<p>I didn't see reference to a period of time (duration) over which source or receiving water must be measured as a baseline.</p>	<p>[Changed]:</p> <p>Thank you for your comment, we have added some guidelines for sampling plan and have advised on sampling frequency, see the section for specific changes</p>
5.1.2 Carbonic acid system	<p><i>[While PHREEQC does not inherently propagate uncertainties in forward modeling, measuring multiple parameters provides a more robust dataset for modeling and analysis.]</i></p> <p>Clarify that PHREEQC outcomes are</p>	<p>[Changed]:</p> <p>Thank you for the comment, the scope of PHREEQC modelling has been clarified. The following changes have been made to the Module, we added after "measuring multiple parameters provides a more robust dataset for modeling and analysis":</p>



	actually validating that all processes in the reactor are taking place as expected. Modeling is not including the fate of CO <sub>2</sub> after the effluent is discharged to the waterbody.	"PHREEQC modeling is used to validate that enhanced weathering processes within the reactor are proceeding as expected and does not include modeling the fate of CO <sub>2</sub> after effluent discharge to the receiving water body."
5.1.2 Carbonic acid system	<p><i>[Project Proponents are required to measure at least three of the following parameters in both the influent and effluent fluids:]</i></p> <p>Clarify at which parts of the unit is sampling conducted? I assume that sampling spots are before influent enters the reactor and just after effluent exits the reactor prior to discharge.</p>	<p>[Changed]: Yes, that is correct. Sampling should be conducted at the influent point before water enters the reactor and at the effluent point immediately after water exits the reactor, prior to any discharge or further treatment. This approach ensures measurements capture the direct impact of the enhanced weathering process within the engineered system. We can add this clarification to make the sampling locations explicit</p> <p>For clarification, we have also revised the text to the following:</p> <p>This Module requires direct monitoring of the carbonic acid system to verify aqueous storage of CO<sub>2</sub>. To adequately constrain the carbonic acid system within the engineered reactor, sampling should be conducted at the influent point before water enters the reactor and at the effluent point immediately after water exits the reactor, prior to discharge. Project Proponents are required to measure at least three of the following parameters in both the influent and effluent fluids..."</p>
5.1.2 Carbonic acid system	<p>[As part of reporting carbonic acid system measurements, Project Proponents must describe in detail the point at which concentrated CO<sub>2</sub> is introduced to the system, whether it is dissolved in water prior to introduction into the reactor or if it is introduced into the reactor directly via bubbling or similar. Where possible, the CO<sub>2</sub> concentration of the influent(water) must be measured directly. Where this is not possible (e.g. in instances where CO<sub>2</sub> is introduced to the reactor directly), Project Proponents must calculate a conservative estimate of CO<sub>2</sub> concentration using the concentration of the CO<sub>2</sub> stream, the reactor volume, and the partial pressure</p>	<p>[No Change]: Thank you for your comment, we have added some guidelines for sampling plan and have advised on sampling frequency, see the Baseline characterization section for specific changes</p>

	<p>of CO<sub>2</sub> in the reactor. All calculations must be described and reported in the PDD.]</p> <p>See previous comment on the need for a more specific manual for project developers to reduce design risks and maximise the efficiency of a new project set up.</p>	
5.1.2 Carbonic acid system	<p><i>[As part of reporting carbonic acid system measurements, Project Proponents must describe in detail the point at which concentrated CO<sub>2</sub> is introduced to the system, whether it is dissolved in water prior to introduction into the reactor or if it is introduced into the reactor directly via bubbling or similar. Where possible, the CO<sub>2</sub> concentration of the influent(water) must be measured directly. Where this is not possible (e.g. in instances where CO<sub>2</sub> is introduced to the reactor directly), Project Proponents must calculate a conservative estimate of CO<sub>2</sub> concentration using the concentration of the CO<sub>2</sub> stream, the reactor volume, and the partial pressure of CO<sub>2</sub> in the reactor. All calculations must be described and reported in the PDD.]</i></p> <p>This is a little confusing to me. I don't see a need to directly measure gas phase CO<sub>2</sub>. Our plan is to measure TA/pH and maybe PCO<sub>2</sub> of the inlet and outlet water streams, as well as water flow rate. With those measurements, we will be able to characterize the carbonate system and determine the respective concentrations and total DIC before and after and, therefore, how much CO<sub>2</sub> was captured and converted to carbonate and bicarbonate. By multiplying that by water volume, we can calculate total stored.</p>	<p>[Changed]:</p> <p>Thank you for your comment. To clarify our requirements:</p> <p>We do not require direct measurement of gas phase CO<sub>2</sub>. The original text states that direct measurement of CO<sub>2</sub> concentration in the influent water is required "where possible." Your proposed approach of measuring TA, pH, and pCO<sub>2</sub> of the inlet and outlet water streams, along with flow rates, is acceptable and aligns with our requirements.</p> <p>The key requirement is that Project Proponents must measure three components of the carbonic acid system for sufficient characterisation. We have revised our language slightly to resolve future confusion.</p>
5.1.2 Carbonic acid system	<p>[Due to the high CO<sub>2</sub> concentrations in reactor streams, it is critical that samples are stored properly and analyzed as soon after collection as possible to mitigate any potential re-equilibration of the carbonic acid</p>	<p>[No Change]:</p> <p>Thank you for your comment. Requiring both analytical methods would significantly increase costs and potentially limit protocol adoption by smaller projects. We believe the current approach provides necessary</p>

	<p>system.]</p> <p>See previous comments of liquid sampling and analysis</p>	<p>environmental protection while maintaining practical feasibility.</p>
5.1.2 Carbonic acid system	<p><i>[Where in-line sensors are installed, Project Proponents are required to report calibration data and frequency, fluid flow paths through the sensor, and measurement error (as determined by measurement of standards).]</i></p> <p>See attached papers in an earlier comment and MEM recent work on sensor installation, calibration and testing.</p>	<p>[No Change]: Thank you for your comment</p>
5.1.3 Turbidity/Total Suspended Solids	<p><i>[In engineered systems where feedstock may be lost]</i></p> <p>This also sounds as a potential risk, elaborate more please.</p>	<p>[No Change]: The risk refers to feedstock loss in reactors where mineral particles can be carried out with the effluent flow. This creates carbon accounting errors if unreacted or partially reacted material escapes (overestimating CO<sub>2</sub> removal), environmental impacts from mineral particles entering receiving waters, economic inefficiency from wasted feedstock material, and potential regulatory non-compliance if suspended solids exceed discharge permit limits. Turbidity/TSS monitoring at influent and effluent points is therefore required to quantify these losses and ensure accurate carbon accounting while maintaining environmental and regulatory compliance.</p>
5.1.3 Turbidity/Total Suspended Solids	<p><i>[In engineered systems where feedstock may be lost, such as fluidized bed reactors, Project Proponents are required to monitor feedstock loss from the system. This should be monitored using turbidity/total suspended solids sensors installed at the influent and effluent points. Alternate methods of quantifying feedstock loss may be appropriate and must be described and justified in the PDD.]</i></p> <p>Why track mineral losses? We can calculate capture and neutralized CO<sub>2</sub> without it. Isn't the characterization of the carbonate system in the solid phase would be enough?</p>	<p>[No Change]: Thank you for your comment. Tracking mineral loss is important to accurately determine 1) how much feedstock actually participated in the reaction to form DIC; 2) whether measured carbonate formation corresponds to feedstock that remained in the reactor versus material that was lost before reacting; 3) the true conversion efficiency of the system. Feedstock loss monitoring provides the mass balance verification needed. This monitoring also serves important operational purposes by helping optimize reactor performance/efficiency and detect system malfunctions, while required for environmental and social safeguarding.</p>
5.1.4 Major and	<i>[Fluid samples must be analyzed by</i>	[No change]

Trace Elements	<p><i>either inductively coupled plasma mass spectrometry (ICP-MS; [ISO 17294-1:2004]) or inductively coupled plasma optical emission spectroscopy (ICP-OES; [ISO 11885:2007]) as the primary determination method. Other high-precision analytical methods such as ion chromatography (IC) is also acceptable for the quantification of major anions (e.g., Cl-, SO42-, NO3-, PO43-).]</i></p> <p>I think that both methods are needed. IC obviously for the cations but ICP-MS is necessary to determine the concentration of heavy metals and other toxic elements that are potentially being discharged to freshwaters.</p>	<p>Thank you for your comment about heavy metals monitoring. When Project Proponents select ICP-MS as their primary method, it provides excellent detection limits for heavy metals and toxic elements, directly addressing this issue. <a href="#">The Rock and Mineral Feedstock Characterization Module</a> already requires comprehensive elemental analysis of input materials, allowing identification of potential toxic element risks upfront. Requiring both analytical methods would significantly increase costs and potentially limit protocol adoption by smaller projects. We believe the current approach provides necessary environmental protection while maintaining practical feasibility.</p>
5.3 Verification of Novel Measurement Methods	<p><i>[the novel measurement technique performs within error of conventional methods for all system variation that can be expected under normal operational conditions.]</i></p> <p>This is also a bit vague. Can you provide references or examples for defining the 'acceptable' error?</p>	<p>[Changed]:</p> <p>Thank you for your comment. It has been specified that these measurements need to align within the more conservative of 3 SD from the mean or 5% error and that an audit by Isometric will be triggered if they do not.</p>
5.3 Verification of Novel Measurement Methods	<p><i>[due to high variability or lack of system characterization, this comparison must be performed, at a minimum, across a full reporting cycle]</i></p> <p>Also explain more what is considered as minimum</p>	<p>[Changed]:</p> <p>Thank you for your comment. The minimum duration is the duration of the Reporting Period.</p> <p>For clarity, this sentence has been revised to: "If this is not possible, due to high variability or lack of system characterization, this comparison must be performed, at a minimum, across a full Reporting Period with sufficient frequency to capture the full range of operational conditions encountered throughout the Reporting Period."</p>
6.1 Monitoring Requirements for Receiving Waters	<p><i>[Project Proponents are responsible for determining appropriate site-specific monitoring locations.]</i></p> <p>This will probably be planned and agreed with the regulators. See previous comments for the EU and the UK.</p>	<p>[No Change]</p> <p>Thank you for the comment. It is expected that monitoring locations are determined via consultation with local regulatory bodies and stakeholder and community input.</p>
6.1.1 Mixing Zone	<p><i>[Thus, environmental monitoring should be focused on the edge of the mixing</i></p>	<p>[No Change]:</p> <p>Thank you for the comment. Monitoring must</p>

	<p>zone.]</p> <p>MRV on the effluent will be taking place at the spot where the reactor is about to discharge the fluids to the mixing zone?</p>	<p>take place on both the effluent stream prior to discharge and at the edge of the mixing zone. Measurements of the effluent stream are used for the purposes of quantification as well as to ensure adherence to safety thresholds. Measurements in the mixing zone are used for the purpose of environmental safeguarding and ensuring adherence to action thresholds.</p>
6.1.1 Mixing Zone	<p><i>[Monitoring Chl-a and dissolved inorganic nutrients are also recommended.]</i></p> <p>And any other site-specific parameters that will be suggested by the regulators.</p>	<p>[Changed]:</p> <p>Thank you for the comment, the following changes have been made to the Module:</p> <p>The original writing is: Monitoring Chl-a and dissolved inorganic nutrients are also recommended.</p> <p>The revised writing is: Monitoring of Chl-a and dissolved inorganic nutrients, as well as any other site-specific parameters suggested by regulators, is also recommended</p>
6.1.2 Biological and Ecological Monitoring in Deployment Area	<p><i>[establishing ecological baselines]</i></p> <p>Comment 1:</p> <p>Ecological baselines and thresholds already exist in most countries in the global north.</p> <p>Comment 2</p> <p>See previous comments on water quality regulations</p>	<p>[No change]:</p> <p>Thank you for your comment. Where ecological baselines and thresholds do exist, they should be adhered to under official permitting requirements. See Section 6.1.3.</p>
6.1.3 Monitoring for Ecosystem Safety	<p>Define safety thresholds?</p>	<p>[No Change]:</p> <p>Thank you for your comment. An environmental risk assessment is conducted to determine potential environmental risks and key indicators which can be used to monitor them. Safety thresholds are thresholds that are imposed on the effluent prior to discharge whereas action thresholds are measured in the receiving waters. Site and project specific thresholds must be described in the PDD.</p>
6.1.3.2 Enforcement Actions	<p><i>[Credits cannot be issued for time periods without sufficient measurements to demonstrate compliance with action and safety thresholds. The handling of data gaps must be reported in the PDD. Removal activity from discharges that occur during time periods of safety threshold violations will not be eligible for</i></p>	<p>[Changed]:</p> <p>Thank you for your comment. We have revised the writing to be more specific:</p> <p>"Sufficient measurements are defined as complying with proposed monitoring plan based on requirements specified in Table A1-2 and regulatory reporting required by official permitting"</p>

	<p><i>crediting. Action threshold violations must trigger adaptive management plans. Failure to adequately address environmental risks or remediate any harm will lead to a project being subject to Credit cessation.]</i></p> <p>What is the required time period for measurements to determine compliance? Is this set out in the regulations/permit?</p>	
10.0 Monitoring Requirements	<p>Feedstock Measurements: Particle Size Distribution and Surface area seems like it is getting into the IP of the company, without impacting the understanding of CO2 capture and storage. Similarly, kinetic models seems irrelevant for this validation process. It is necessary for companies to understand and design around, but not for quantification. Why include it here, especially if data is to be made public?</p> <p>Turbidity seems only mildly useful as it is not quantifiable in terms of precipitation (unless I am missing something).</p>	<p>[No Change]:</p> <p>Thank you for your comment. These measurements are used to contextualize CDR quantification metrics, such as expected reaction rate. Any IP concerns can be discussed during the verification process and redactions from the public registry can be requested.</p>
11.0 Project Design Document Requirements	<p>Again, details of the reactor design, kinetic models, etc. seems out of scope and risky to the companies. Why is this required? If the team needs to understand the process, then this information should be kept strictly confidential.</p>	<p>[No Change]:</p> <p>Thank you for your comment. This information will be kept confidential but is necessary for validating the ability of the project to remove carbon, as assessing reactor design is critical for understanding implementation of the project.</p>