Application Supplement: Surface Mineralization

(Only fill out this supplement if it applies to you)

Source Material and Physical Footprint (Criteria #1 and #8)

1. What source material are you using, and how do you procure it?

<100 words

2. Describe the ecological impacts of obtaining your source material. Is there an existing industry that co-produces the minerals required?

<100 words

3. Do you process that source mineral in any way (e.g grinding to increase surface area)? What inputs does this processing require (e.g. water, energy)? You should have already included their associated carbon intensities in your LCA in Section 6.)

<200 words

4. Please fill out the table below regarding your project's physical footprint. If you don't know (e.g. you procure your source material from a mining company who doesn't communicate their physical footprint), indicate that in the square.

	Land area (km^2) in 2021	**Competing/existing project area use (if applicable)**
Source material mining	*E.g. X km^2 (dedicated basalt mining facility)* OR *N/A (material is waste product from X km^2 mine)*	*E.g. Existing mine for basalt*
Source material processing	*E.g. 2 km^2 (manufacturing facility or mine)*	*E.g. Gravel production facility*

Deployment	*E.g. 20 km^2 (transportation hub + beach area)*	*E.g. Agricultural land + beach*

9. Imagine, hypothetically, that you've scaled up and are sequestering 100Mt of CO_2/yr. Please project your footprint at that scale (we recognize this has significant uncertainty, feel free to provide ranges and a brief description).

	Projected # of km^2 enabling 100Mt/yr	**Projected competing project area use (if applicable)**
Source material mining		
Source material processing		
Deployment		

5. If you weren't proceeding with this project, what's the alternative use(s) of your source material? What factors would determine this outcome? *(E.g. Alternative uses for olivine include X & Y. It's not clear how X & Y would compete for the olivine we use. OR Olivine would not have been mined but for our project.)*

<50 words

Measurement and Verification (Criteria #4 and #5)

6. We are aware that the current state of the field may include unknowns about the kinetics of your material. Describe how these unknowns create uncertainties regarding your carbon removal and material, and what you wish you knew.

<200 words

7. If your materials are deployed extensively, what measurement approaches will be used to monitor weathering rates across different environments? What modelling approaches will be used, and what data do these models require?

<100 words

Human and Ecosystem Impacts, Toxicity Risk (Criteria #7)

8. What are the estimated environmental release rates of heavy metals (e.g. Cr, Ni, Pb, Hg)? Dust aerosol hazards? P loading to streams? How will this be monitored?

<100 words

9. If minerals are deployed in farmland, what are the estimated effects on crop yields, what's this estimation based on, and how will actual effects be monitored?

<100 words

10. How will you monitor potential impacts on organisms in your deployment environment? (E.g. Health of humans working in agricultural contexts, health of intertidal species, etc. depending on the context of deployment)

<100 words

11. If you detect negative impacts, at what point would you choose to abort the project and how?

<100 words