Soil Enrichment Protocol Workgroup Meeting 2

Friday March 6th, 2020

Housekeeping

- Workgroup members have the opportunity to actively participate throughout the meeting
  - Ask that you keep yourselves muted unless / until would like to speak
- We will ask and take questions throughout the session
- All other attendees/observers are in listen-only mode
- We will follow up via email to answer any significant questions not addressed during the meeting
- The slides and a recording of the presentation will be posted online

Agenda

I. Introductions
II. Process Overview
III. Protocol Overview
IV. Key Issues
V. Open Discussion
VI. Next Steps

INTRODUCTIONS

Introductions

Reserve Staff:

- Sami Osman, Senior Policy Manager
  - Protocol development lead
- Heather Raven, Senior Project Coordinator
  - Development process coordinator
- Jon Remucal, Senior Forest Policy Manager
  - Protocol development
- Sarah Wescott, Senior Forest Program Manager
  - Protocol development

Workgroup Members

Name (alphabetical)	Organization
Adam Chambers	USDA Natural Resources Conservation Service
Amrith Gunasekara	California Department of Food & Agriculture
Dan Kammen	UC Berkeley
Dorn Cox	Wolfe's Neck Center for Agriculture & the Environment
Christian Davies	Shell
Jacqueline Gehrig-Fasel	TREES Consulting LLC
Grayson Badgley	Columbia University
Jon Sanderman	Woods Hole Research Center
Justin Allen	Salk Institute of Biological Studies
Karen Haugen-Kozyra	Viresco Solutions
Keith Paustian	Colorado State University

Name (alphabetical)	Organization
Ken Newcombe	C-Quest Capital
Matt Ramlow	World Resources Institute
Max DuBuisson	Indigo Ag
Mitchell Hora	ContinuumAg LLC
Nicholas Goeser	Alliance of Crop, Soil and Environmental Science Societies
Patrick Splichal	SES, Inc.
Robert Parkhurst	Sierra View Consulting
Stephen Wood	The Nature Conservancy
Tom Cannon	Goodson Ranch
Tom Stoddard	NativeEnergy
William Schleizer	Delta Institute

PROCESS OVERVIEW

Protocol Development Overview

- **GOAL**: To create a robust Soil Enrichment Protocol that provides best practices for GHG accounting, in particular for increases in soil organic carbon stocks, and reductions in other GHGs, in order to generate Climate Reserve Tonnes (CRTs)
  - Adhere to high quality offset criteria and Reserve's principles
  - Leverage lessons learned from emerging technologies, other offset protocols and projects, other regulatory programs, other conservation programs
  - Solicit and incorporate expert stakeholder feedback

Protocol Development Timeline

1. Scoping meeting (*January 15, 2020*)
2. Workgroup process (*Jan – Feb 2020*)
   - Formation (*Jan 2020*)
   - Meeting 1 (*Feb 6, 2020*)
   - Meeting 2 – this meeting (Mar 6, 2020)
   - Meeting 3 (Friday April 3rd 2020)
   - 30-day public comment period (*Apr – May 2020*)
3. Board adoption *(Jun 10, 2020)*

~ 5 months

PROTOCOL OVERVIEW

Protocol Overview

I. Eligibility & Additionality

II. Ownership, Aggregation & Permanence

III. Quantification

   I. Direct measurement & modelling

   II. Sampling & stratification

IV. Monitoring, Reporting & Verification

ELIGIBILITY – ADDITIONALITY

OWNERSHIP – AGGREGATION – PERMANENCE

Eligibility & Additionality

Project definition: *the adoption of agricultural management practices that are intended to increase soil organic carbon (SOC) storage and/or decrease net emissions of CO_2, CH_4, and N_2O from agricultural operations, as compared to the baseline.*

- **Growers must adopt at least one new practice change**
  - Adoption of multiple regenerative ag practices is not common practice
  - Adoption of a single regenerative ag practice, where none already occurring, requires demonstration such practice is not common practice in given region (perhaps looking at specific combination crop / activities / region)
- Provide an “indicative list,” but not a “positive list”
- Practices must be different than the baseline management, and must be able to be quantified with the chosen model
  - Model validation requirements will ensure quantifiability

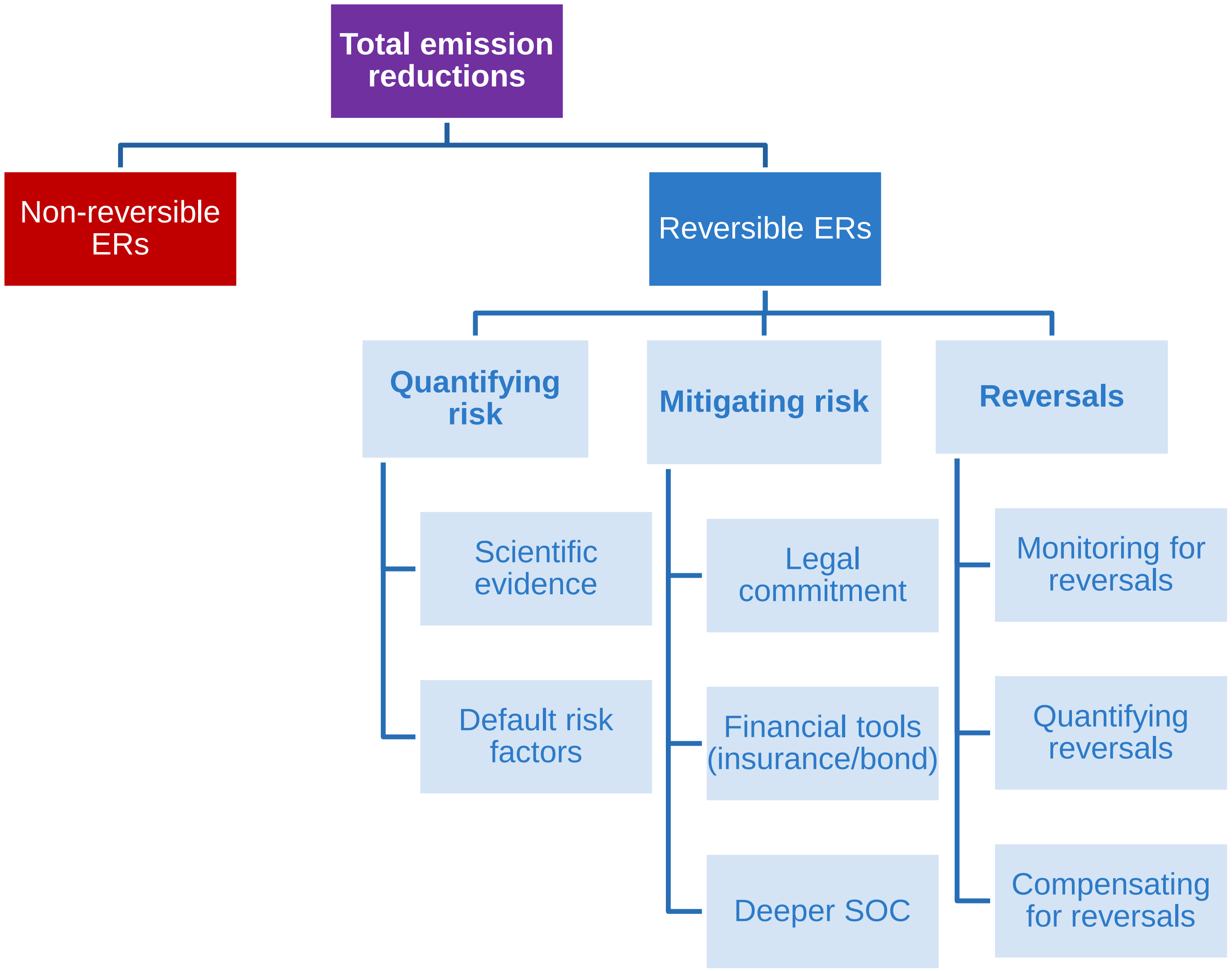
Aggregation & Ownership

- Two options for project development:
  - Individual grower = individual project
  - Multiple fields/growers aggregated together = individual project
- Allow for decoupling GHG rights from land rights
  - Assume the grower owns GHG rights *unless* contractually transferred to an aggregator
  - Don’t require grower to produce deed/title to the property
  - Single aggregator would own all GHG rights for any field within the project, meaning **“project” would have a single point of ownership**
- No limit on number of fields or combos of crop/region/practice in an aggregate
  - Relative size threshold to avoid single field biasing the whole project
- CRTs issued to the aggregated project as a whole, not differentiated by field
- Quantification allows for a sampling approach, accounting for introduced uncertainty

Permanence – Assessing Reversal Risk

Activity	Unavoidable / avoidable	Incidence	Impact on SOC
Return to intensive tillage	Avoidable	?	Medium?
Other mechanical disturbance	Avoidable	?	?
Erosion from exposed soils	Avoidable	?	?
Less efficient use of synthetic N fertilizer	Avoidable	?	Low?
Overly intensive grazing	Avoidable	?	Low?
Catastrophic fire?	Unavoidable	?	Low?
Catastrophic flood?	Unavoidable	?	Medium?
Financial failure of the aggregator	Avoidable	?	?
Land use change	Avoidable	?	High?
Other?	?	?	?

Permanence



Total emission reductions
Non-reversible ERs
Reversible ERs
Quantifying risk
Mitigating risk
Reversals
Scientific evidence
Default risk factors
Legal commitment
Financial tools (insurance/bond)
Deeper SOC
Monitoring for reversals
Quantifying reversals
Compensating for reversals

Permanence

- We want to **manage the risk** of reversal over 100 years, while reducing the burden on growers and project developers to make long-term commitments
- Assess permanence at the project level
  - Risk and liability are placed on the aggregator, rather than the grower
- Key mitigation measures
  - Contracts between Reserve / aggregator (Project Implementation Agreement or PIA)
  - Buffer pool contributions – risk-based %
  - Optional tonne-year accounting
  - Also explore insurance / surety bonds

Mitigating Reversal Risk

- Allow for PIA (the legal commitment) of **any length**, so long as, at the end of the PIA term, one of the following occurs:
  1. The Project Owner signs an amendment to **extend the PIA**; or,
  2. The Project Owner receives Reserve **approval for some form of risk mitigation** that relieves them of any further obligation
     - Including options such as assessing recidivism, buying insurance, etc.
  3. The Reserve declares a **reversal** and the Project Owner complies with the requirements of the protocol as regards quantifying and compensating for the reversal.
- Assessing reversals
  – Development of a remote monitoring platform with an algorithm trained to recognize changes that could indicate reversals (e.g., sustained poor crop health, tillage, etc.), allowing independent identification of reversals

  – Assessment of farmer recidivism rate with a performance threshold (e.g., if 95% of farmers maintain practices after 30 years, the SOC is considered permanent)

Double Counting & Crediting Period

- Generally open to credit and payment stacking
  - Allow NRCS practice payments since the eligible activities have to be new to be included as additional
  - Avoid payments for practice change that are specifically targeting GHG reductions and/or SOC storage and are delineated in tCO_2e
- Crediting period proposed as **30 years**, nonrenewable
  - Forest protocol: 100 years
    - Too long for agricultural land management projects
  - US Grassland protocol: 50 years
    - Unlikely that SOC gains would be worthwhile this far into the future
    - Concern around validity of baseline management practices this far into the future
  - Canada Grassland protocol: 30 years
    - Long enough to capture the significant SOC gains of cropland management changes

QUANTIFICATION

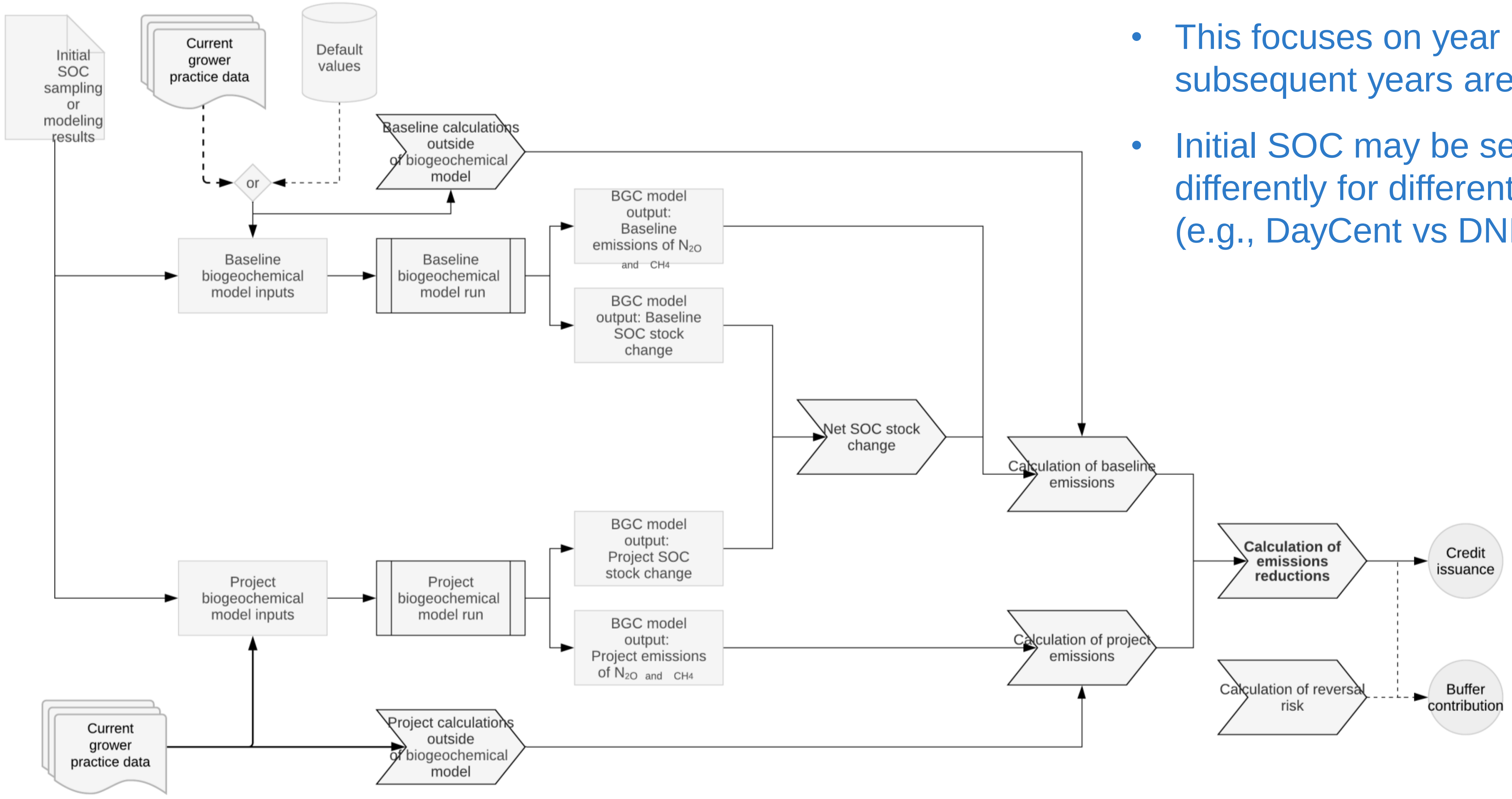
GHG Assessment Boundary

CO_2	CH_4	N_2O
• SOC stock change • Fossil fuels	• Soil methanogenesis • Grazing • Biomass burning	• Fertilizer application • N-fixing species • Grazing • Biomass burning

Quantification – Overview

- Quantify emission reductions on fields chosen through stratification & sampling – extrapolate
- Hybrid quantification approach including direct measurement of soil samples + modelling
  - Take initial direct SOC measurement – some flexibility as to when first sample taken
  - Allow for modelling of emission reductions for multiple reporting periods
  - Periodically take further SOC measurements (at least every 5 years)
    - Could choose to do direct sampling for any given year
- Set minimum standards for
  - Frequency of and methods for soil sampling
  - Types of Biogeochemical model – how model must be validated / calibrated – securing info integrity
- Baseline set by:
  - Baseline practices determined using historical data (at least 2 years prior to start date)
  - Baseline SOC directly measured
  - Baseline business-as-usual modelled into future
- Emission reductions calculated separately for reversible and non-reversible reductions

Quantification Conceptual Model



- This focuses on year 1, but subsequent years are similar
- Initial SOC may be set differently for different models (e.g., DayCent vs DNDC)

Model Validation

- Example model guidance:
  - Publicly-available (free or for a fee)
  - Peer-reviewed by a recognized, competent organization, or an appropriate peer review group
  - Validated with data from paired modeled and direct-re-measured sample sites subject to control and treatment scenarios. Model validation must demonstrate that predictions are consistent with observations across the range of biophysical and management-based scenarios included in the Project. Validation assessment must be based on standard metrics such as coefficient of determination (R^2), Nash-Sutcliffe model efficiency, and root mean square error (RMSE), following FAO (2019)
  - The model must incorporate one or more input variables that are monitored *ex post*
  - *guidance for verifiers on model sensitivity to inputs*

Soil Sampling & Stratification

- Flexibility in sampling design, with minimum standards to ensure consistency and avoid gaming or intentional bias
- Minimum number of samples per field
- Minimum standards for randomization and field-level stratification
- Consistent approach for quantifying uncertainty

Uncertainty

- Draft VCS methodology
  - Account separately for sample error, model input error, and model structural uncertainty
  - Wrapped up into an overarching uncertainty value at 95% confidence
  - No deduction for uncertainty below 15% error (VCS Standard), linear deduction for uncertainty above 15% (e.g. total uncertainty of 20% would lead to a 5% uncertainty deduction)
- Reserve Forest Protocol
  - Focus on sample error
  - Goal of +/- 5% at 90% confidence, linear deduction for uncertainty exceeding +/- 5%

Table 2.1. Target Sampling Error at the 90 Percent Confidence Level for Projects Participating in an Aggregate

Number of Participating Projects in the Aggregate	Target Sampling Error (TSE)
2	7%
3	8%
4	9%
5	10%
6	11%
7	12%
8	13%
9	14%
10	15%
11	16%
12	17%
13	18%
14	19%
15+	20%

MONITORING – REPORTING – VERIFICATION

Monitoring & Reporting

- Flexible reporting periods to align with **agronomic cycles**
  - Start with earliest field post-harvest and end with latest field harvest
- Rely on grower attestation for **qualitative data** (e.g., crop rotation, tillage, type of fertilizer) where independent sources unavailable
- Hierarchy of data sources for **quantitative inputs** to model baseline
  a. Direct grower records or data sources
  b. Written agronomic plans
  c. Grower attestation, if value align with evidence-supported values from similar fields
  d. Published regional average values
- Leverage remote sensing and machine data where possible
- Rely on remote sensing for monitoring for reversals after crediting
  - E.g., catastrophic flooding, prolonged conventional tillage, land use change

Verification

- Risk-based sampling approach
  - No need to visit thousands of fields or review 100% of data/evidence
- Explore the use of proxies for site visits or to otherwise supplement verification activities
  - Existing government programs that involve outside review and/or records of farm activities
  - Leverage expertise of trusted 3rd parties (e.g., university extension, NRCS)
    - Consider COI review for such 3rd parties
  - Remote sensing
  - Existing data capture systems/tools
- Look for ways to avoid need for specialized expertise on the verification team
  - BGC model results and input files packaged with a digital signature to verify they have not been tampered with since the model run; thus avoiding need for verifier to rerun the model
    - Provide verifiers guidance as to which input parameters are most sensitive

Data Security

CLIMATE ACTION RESERVE

Data generated

Grower

- Practices
- Ownership
- Field boundaries
- Contracts
- GHG data

Data generated

Aggregator

- Project submittal form
- Other submittal documentation
- Aggregated GHG data
- Field-level data
- Comprehensive monitoring report

Data generated

Verifier

- Verification report
- Verification statement

Data generated

Registry

- Project submittal form
- Verification report & statement
- Credit issuance

Data generated

Buyer

- Credits retired by batch (tied back to project &vintage)

- Each box shows the data generated and passed along to the next stage
- Sensitive and/or personally-identifiable (SPI) info is highlighted in orange text
- Dashed line shows point at which personally-identifiable info no longer viewable
- Contracts between parties to left of dashed line used to manage (SPI) info

NEXT STEPS

Protocol Development Process & Timeline

Milestone	Date
Second workgroup meeting (webinar)	Today, March 6th
Third workgroup meeting (webinar)	**Friday, April 3rd, 8:00 am – 12:00 pm PT**
Workgroup comment period	First week of April
Public comment period	April – May
Protocol presented to Reserve Board for approval	*Expected June 10*

Next Steps

- **Workgroup members:**
  - Email any feedback
  - Reach out if you’d like to setup 1:1 chat with staff
  - Prepare for next full workgroup meeting
- **For Reserve staff:**
  - Protocol drafting!!
  - Full draft to workgroup prior to 3rd workgroup meeting
  - Prep for 3rd workgroup meeting

Key Contacts

- General questions or assistance:
  - Policy@climateactionreserve.org

- Protocol development lead:
  - Sami Osman, Senior Policy Manager, Climate Action Reserve
  - sosman@climateactionreserve.org