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Request for Proposals to Provide Technical Consulting Services in Support of the Development of a New Standardized Quantification Methodology for the Reserve's Nitrogen Management Project Protocol

May 5, 2017

Overview

The Climate Action Reserve (Reserve) is undertaking a significant revision and expansion to its Nitrogen Management Project Protocol (NMPP) to make the NMPP a more workable protocol that succeeds in getting projects implemented and N₂O emissions reduced. To assist with this effort, the Reserve is seeking a technical contractor to develop a new standardized quantification methodology module(s) that expand(s) the scope of the Reserve's NMPP Version 1.1 to include additional regions, crops, and nitrogen management practices. A strong emphasis is placed on prioritizing ease-of-use, while also applying the best available science.

Background

The Reserve is an offset registry serving the California cap-and-trade program and the voluntary carbon market. The Reserve encourages actions to reduce greenhouse gas (GHG) emissions and works to ensure environmental benefit, integrity and transparency in market-based solutions to address global climate change. It operates the largest accredited registry for the California compliance market and has played an integral role in the development and administration of the state's cap-and-trade program. For the voluntary market, the Reserve establishes high quality standards for carbon offset projects, oversees independent third-party verification bodies, and issues and tracks the transaction of carbon credits (Climate Reserve Tonnes or CRTs) generated from such projects in a transparent, publicly-accessible system.

The Reserve has been working on agricultural offsets since 2010, and in June 2012, the first version of the NMPP (Version 1.0) was adopted following two years of policy research and protocol scoping, and a year-long stakeholder-driven protocol development process. The NMPP provides guidance on how to quantify, monitor, and verify GHG emission reductions from improved nitrogen management via reductions in nitrogen application rate (N-rate) on corn plots in the Midwest, with a quantification methodology based off the MSU-EPRI method.¹ The

¹ Millar et al. (2012). *Methodology for Quantifying Nitrous Oxide (N₂O) Emissions Reductions by Reducing Nitrogen Fertilizer Use on Agricultural Crops*. Version 1. American Carbon Registry, Winrock International, Little Rock, Arkansas. July 2012. Available at: https://lter.kbs.msu.edu/docs/robertson/Millar_et_al_2012_ACR.pdf

current version of the protocol (Version 1.1) was released in January 2013, after making a number of usability improvements. In late 2013, the Reserve received grant funding from the Packard Foundation and embarked on an effort to further expand the protocol using N₂O emissions data from fertilizer management on irrigated corn in Colorado. However, at the time, it was determined from preliminary work that there were insufficient data available for replication of the study in other sites (i.e., other sites within the county, state, region), for the purposes of validation of what would have been a new empirical model and calculating of an associated uncertainty deduction. The same Packard Foundation grant also allowed the Reserve to explore whether the USDA *Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory* report's (USDA GHG Methods document, also known as the "Blue Book") N₂O methodology,² with regional emission factors and scaling factors for different activities, would be appropriate for integration into the NMPP. Ultimately, here too, the Reserve decided that insufficient ability to quantify uncertainty of the model did not allow for integration into the protocol at that time. To date, no projects have been registered using the NMPP and, as such, the Reserve has continued to explore further revisions, improvements, and expansions.

In addition to the NMPP, the Reserve has developed three other GHG emission reduction project protocols for the agricultural sector in the United States: the Livestock Project Protocol, Rice Cultivation Project Protocol, and most recently, the Grassland Project Protocol (GPP), which avoids the conversion of grassland into cropland. The GPP, first adopted in 2015, benefited from lessons learned from the Reserve's other agricultural protocols, and was developed with a particular focus on improving usability and reducing costs. The GPP is a highly streamlined, easy-to-use Tier 3 protocol, but with simplified Tier 2 style inputs. In less than two years, this protocol already has more projects in the pipeline (new, listed, and commencing verification activities) than the Reserve's NMPP and RCPP combined.

With the support of the U.S. Department of Agriculture, Natural Resources Conservation Service, under the Conservation Innovation Grant (CIG) program,³ the Reserve is launching a significant NMPP expansion and revision to Version 2.0. The overarching goal of the protocol revision is to improve usability, applicability to more regions and for more crops and practices, and succeed in getting projects implemented and N₂O emissions reduced. Simplicity, while maintaining scientific credibility, will be emphasized throughout. The Reserve plans to make numerous technical revisions throughout the existing protocol to improve clarity and ease-of-use. These revisions will also be targeted at making the protocol more modular in its approach (i.e., those implementing N-rate reductions in the Midwest might use certain modules, while those implementing fertigation and reduced N-rates on tomatoes in California might use others). The Reserve intends to keep the current protocol's quantification methodology that is based on the MSU-EPRI model (likely with improvements), with the intention that the technical contractor will provide additional quantification modules. However, if the technical contractor's proposed module(s) are widely applicable and include coverage of broader N-management practices on corn in the Midwest, the Reserve may consider replacing the MSU-EPRI module.

This protocol revision will focus on developing a standardized and streamlined quantification methodology that meets the requirements of the Climate Action Reserve. The Reserve will be

² Eve, M., D. Pape, M. Flugge, R. Steele, D. Man, M. Riley-Gilbert, and S. Biggar, (Eds), 2014. *Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory*. Technical Bulletin Number 1939. Office of the Chief Economist, U.S. Department of Agriculture, Washington, DC. 606 pages. July 2014. Available at: https://www.usda.gov/oce/climate_change/Quantifying_GHG/USDATB1939_07072014.pdf

³ This work is a part of the Nitrogen Management CIG led by Environmental Defense Fund (EDF), grant number 69-3A75-16-016, which includes numerous partners all working to increase the number of N₂O reducing N-management carbon offset projects in the U.S.

relying, in part, on existing methodologies, tools, and protocols with which the contractor should be familiar prior to beginning this effort (Appendix A).

Project Overview

The Reserve seeks to develop a streamlined, standardized quantification methodology for improved nitrogen management projects with a module(s) capable of quantifying N₂O emissions reductions from additional regions (with special attention to California), crops and crop rotations, and nutrient management practices as outlined in the Scope of Work below. The Reserve intends to keep the current protocol's quantification methodology that is based on the MSU-EPRI model, where the only project activity is the reduced rate of nitrogen applications to fertilize corn crops in the Midwest. The technical contractor will provide additional quantification modules and is not expected to work on improvements to the MSU-EPRI module. As noted above, however, if the proposed module(s) are widely applicable and include coverage of broader N-management practices on corn in the Midwest, the Reserve may consider replacing the MSU-EPRI module. Respondents to this request for proposals must propose to carry out everything in the Scope of Work. Proposals that cover only a portion of the Scope of Work will not be considered.

Expected Protocol Development Timeline

Solicitation for contractor and workgroup	May 2017
Engagement with technical contractor*	May – August 2017
Protocol drafting and engagement with expert workgroup	May 2017 – September 2017
Public comment period	late-August – late-September 2017
Protocol adoption by Reserve Board of Directors	October 18, 2017

* Please note, a more detailed contractor timeline is provided on page 6.

Scope of Work

The contractor will assist Reserve staff on specific technical aspects of quantification methodology development. The goal of this work is to standardize and simplify, as much as possible, the quantification methodology applied by project developers. The intent is to:

- 1) Expand the protocol scope to incorporate additional practices, regions, and crops where quantification is feasible and the associated model(s) can be sufficiently calibrated and validated;
- 2) Improve the ease of quantification (compared to other nitrogen methodologies) while upholding an appropriate level of accuracy and uncertainty, and maintaining the Reserve's high standards of quality; and
- 3) Reduce the time and effort involved with quantification, thus enhancing the protocol usability, individual project feasibility, and verification reviews.

The contractor is expected to work independently with guidance and oversight from Reserve staff to complete the following task and subtasks.

Task: The Development of Streamlined Quantification Methodology

Subtask 1: Develop quantification modules for the estimation of nitrous oxide (N₂O) emission reductions from different region-crop-practice combinations

The Reserve protocol will ideally specify a limited set of options for the estimation of N₂O emissions, with guidance detailing when and how each option should be employed. The contractor will evaluate existing options and work with Reserve staff to develop the most appropriate, accurate, and consistent approach that is both technically and financially feasible.

The following crops, regions, and practices are high priorities of the Reserve to include in quantification modules proposed by the contractor. The proposal **must** include, at minimum, one California module that addresses these high priorities:

- Crops:
 - Corn (additional regions, practices, better incorporation of crop rotations)
 - Other Major U.S. Field Crops (e.g., cotton, soybeans, wheat), with preference given to crops with the largest potential acreage, largest potential emission reductions, or both
 - California Specialty Crops (e.g., lettuce, grapes, tomatoes, almonds)
- Regions:
 - The Midwest (additional crops and practices)
 - California
 - Other regions with large emission reduction potential
- Nutrient Management Practices
 - N-rate reductions (for additional crops and regions)
 - N-management improvements on corn in the Midwest⁴
 - N timing
 - N placement
 - N source
 - Use of Enhanced Efficiency Fertilizers (EEFs)

Additional information on priorities for inclusion, as indicated by Reserve stakeholders is available in the Reserve's *Nitrogen Management Survey Results Memo*, published in March 2017 and available on the Reserve's NMPP webpage.⁵ Other methodology options, including additional regions in the United States, crops, and practices (e.g., cover crops, precision agriculture, manure management) identified as having N₂O mitigation potential may also be proposed by the contractor. The Reserve is open to considering their incorporation, but these additional modules are not required for a "complete" proposal.

While this is not an exhaustive list, the Reserve encourages RFP respondents to consider basing their proposed quantification modules on the following approaches:

⁴ Notably, N-rate reductions on corn in the Midwest are covered by the current MSU-EPRI quantification methodology module in the existing NMPP. At present, the Reserve plans to retain the MSU-EPRI module for corn in the Midwest, possibly with some Reserve-led modifications, but is not seeking a contractor for making these changes to the MSU-EPRI module. However, if the proposed module(s) are widely applicable and include coverage of broader N-management practices on corn in the Midwest, the Reserve may consider replacing the MSU-EPRI module.

⁵ <http://www.climateactionreserve.org/how/protocols/nitrogen-management/revision>

- Developing standardized parameters and emission factors carried out with a modeling approach in a manner similar to that of the Reserve's Grassland Project Protocol (Appendices B and C of the GPP)⁶
- Complimenting the above (where appropriate) by developing practice-specific scaling factors and IPCC Tier 1 default emission factors, as done in the USDA's methodology for estimating soil N₂O emissions
- Developing a method, which utilizes the IPCC Tier 1 default emission factor at the project level, with a stringent discount rate/deduction to account for the uncertainty and degree of inapplicability to various crops and regions. If this option is pursued, additional rationale is necessary to support the scientific defensibility of this option. Notably, adaptation from the MSU-EPRI Tier 1 approach is an option

Completion of this subtask will require modeling and analysis of data, employing the following eligible sources:

- Other published quantification methodologies, biogeochemical process models, and tools (see Appendix A)
- Regional inventories or databases
- Published, peer-reviewed studies and the associated field-level measurements
- Published government data

It is also worth noting that the Reserve's Minimum Data Standard (MDS) and Data Submittal Process,⁷ which was developed so that stakeholders could submit new data for consideration at any time, has been suspended while the Reserve works on the current protocol expansion and revision. Proposals are not required to meet all criteria of the MDS but, where possible, should take into consideration the high standards established therein.

Subtask 2: Produce guidelines to ensure quantification is carried out in a reliable and easily reproducible manner

The contractor will assist the Reserve with developing prescriptive quantification guidance, such that each project would follow the same steps, ideally without the need for the project-specific model runs. This includes the development of default baseline activity assumptions that can be used to develop emission factors to be used in place of project-specific modeling.

Subtask 3: Uncertainty assessment

Some level of uncertainty will be inherent in the development of a quantification methodology. The contractor **must** determine the most appropriate methods to account for the uncertainty, particularly structural uncertainty, associated with the quantification methodology developed for NMPP V2.0. This could include the development and incorporation of discount factors, risk adjustments, or confidence deductions, amongst other options.

⁶ <http://www.climateactionreserve.org/how/protocols/grassland/>

⁷ <http://www.climateactionreserve.org/how/protocols/nitrogen-management/data-submittal/>

Subtask 4: Additional considerations

If stratification is required for developing emission factors and/or other prescribed quantification steps and for reducing uncertainty, then the contractor shall determine the rules for and develop standardized guidelines for stratification. Similarly, should a set of standardized assumptions be required for the quantification of N₂O emissions from selected practice-region-crop combinations, they must be developed and clearly defined by the contractor.

Timeline and Deliverables

RFP released	May 5, 2017
Proposals due to the Climate Action Reserve	May 21, 2017
Contract awarded	June 2, 2017
Phase 1: <ul style="list-style-type: none"> ▪ Contractor works with the Reserve to refine proposal for subtasks 1-4, incorporating Reserve feedback, as necessary ▪ Deliverable: Outline for methodology module(s) (and other subtasks, if required) 	Deliverable Due: June 30, 2017
Phase 2: <ul style="list-style-type: none"> ▪ Contractor completes subtasks, in draft form, to be included in the Workgroup Draft of the NMPP ▪ Contractor refines subtasks into a final draft, to be included in the Public Comment Draft of the NMPP 	Draft Deliverable Due: July 21, 2017 Final Deliverable Due: August 14, 2017

Evaluation Criteria

The Reserve will evaluate proposals for this project based on the following factors:

- Knowledge of and experience working with the agricultural sector on GHG and/or other environmental services
- Demonstrated expertise in soil nitrogen dynamics, measurement, and modeling
- Knowledge of and experience with collecting/analyzing relevant cropland, nutrient and/or soil management data sets
- Technical understanding of different soil N₂O quantification models and methods
- Familiarity with the Climate Action Reserve's Nitrogen Management Project Protocol Version 1.1, as well as other relevant N-management methodologies (see Appendix A)
- Understanding of the Climate Action Reserve and other GHG programs, and GHG offsets markets
- Quality of written materials and technical documents
- Communication and organizational skills
- Competitiveness/value of project budget
- Proven ability to deliver projects on time

Application Process

Interested contractors must submit proposals to the Reserve by **12 PM PDT on Monday, May 22, 2017**. No late or incomplete proposals will be considered. All proposals must include the following information:

- Brief cover letter (maximum 2 pages)
- Short proposal (maximum 10 pages) which must include:
 - Statement of qualifications
 - Proposed fixed price budget
 - If the proposal includes multiple methodology modules, please provide an estimate of level of effort and/or cost breakdown associated with each individual option for the Reserve's consideration
 - Proposed schedule
 - Client references (at least three)
- Sample work product (work products will not be returned)

Contractors must bid to work on the entire scope of work contained within this request. Proposals for partial completion of the full suite of deliverables will not be considered.

Interested contractors are also expected to agree to the Reserve's Independent Contractor Services Agreement (available on the Reserve's [Nitrogen Management Project Protocol webpage](#)). This should be reviewed by interested contractors and their lawyers prior to submitting a proposal.

Proposals must be submitted via email, fax, or mail. Please submit proposals to:

policy@climateactionreserve.org

Please include "Proposal for Nitrogen Contractor" in the Subject line

or

Climate Action Reserve
Attn: Proposal for Nitrogen Contractor
601 W. 5th Street, #650
Los Angeles, CA 90071

or

FAX: (213) 623-6716

Questions?

If you have any questions about the project or proposal process, please contact Trevor Anderson at (213) 891-6927 or tanderson@climateactionreserve.org.

Appendix A: Existing Resources Related to the Development of the NMPP V2.0 Quantification Methodology

Table A.1. Existing Quantification Models and Tools

Quantification Tool (in alphabetical order)	Overview
COMET-Farm	<ul style="list-style-type: none"> User-friendly tool with an underlying complex biogeochemical model that guides users through alternative future management scenarios to estimate and compare the changes in GHG emissions between current management practices and future scenarios Available at: http://cometfarm.nrel.colostate.edu/
COMET-Planner	<ul style="list-style-type: none"> Evaluation tool to estimate potential carbon sequestration and GHG reductions from adopting NRCS conservation practices based on farm location, size and conservation practices under consideration Available at: http://www.comet-planner.com/
Denitrification-Decomposition (DNDC)	<ul style="list-style-type: none"> Complex, Tier 3 process-based biogeochemical model for predicting N₂O emissions in agroecosystems Available at: http://www.dndc.sr.unh.edu/
MSU-EPRI	<ul style="list-style-type: none"> Empirical, Tier 2 model of N₂O loss as a function of N applied on corn plots in the North Central Region (NCR) An adaptation of this methodology is currently included in the Reserve's NMPP, as well as ACR and VCS protocols. Version 1, available at: https://lter.kbs.msu.edu/docs/robertson/Millar_et_al_2012_ACR.pdf

Table A.2. Existing Protocols and Quantification Methodologies

Program (in alphabetical order)	Protocol
Alberta's Regulatory Cap-and-Trade Program	<ul style="list-style-type: none"> Quantification Protocol for Agricultural Nitrous Oxide Emission Reductions v2.0
American Carbon Registry (ACR)	<ul style="list-style-type: none"> Reduced Use of Nitrogen Fertilizer on Agricultural Crops v1.0 Changes in Fertilizer Management v2.0 (v2.1 in Scientific Peer Review)
Climate Action Reserve (Reserve)	<ul style="list-style-type: none"> Nitrogen Management Project Protocol V1.1 Grassland Project Protocol V2.0 (notably, this is not a nitrogen protocol, but the approach for methodology development is worth considering for RFP respondents)
IPCC	<ul style="list-style-type: none"> Tier 1, Tier 2 and Tier 3 Methods for estimating N₂O Emissions from Managed Soils
N ₂ O Methodology in the USDA GHG Methods document ("Blue Book")	<ul style="list-style-type: none"> Quantifies N₂O emissions from soils using a hybrid Tier 3 and Tier 1 approach based on nitrogen inputs, base emission rates for different soil texture classes developed from experimental data and process-based modeling, practice-based scaling factors for additional management changes, and/or the IPCC default factor Available at: https://www.usda.gov/oce/climate_change/Quantifying_GHG/USDATB1939_07072014.pdf
Verified Carbon Standard (VCS)	<ul style="list-style-type: none"> VM0022 – Quantifying N₂O Emissions Reductions in Agricultural Crops through Nitrogen Fertilizer Rate Reduction v1.1