

EXHIBIT A
Work Plan, Schedule and Budget
For Fiscal Years 2019-2020 through 2021-2022

PROJECT NAME: Use of Portable Field Kilns to Process Biomass and Make Biochar

SUBGRANTEE NAME: Sonoma Ecology Center

PROJECT DESCRIPTION:

This demonstration project was selected to help the North Coast Resource Partnership (NCRP) realize the goals of the Regional Forest and Fire Capacity (RFFC) Program. Under the RFFC Program, the NCRP will develop a North Coast Regional Priority Plan (RPP). The RPP will include a comprehensive and integrated set of strategies, actions and projects to support forest and community health and long-term resilience to wildfire. The purpose of the demonstration projects selected by the NCRP is to model processes and on-the-ground projects designed to test concepts, methods, and innovative techniques to identify effective management practices for fuel load reduction and forest health that can be quantified and scaled up in the region and elsewhere. Data, performance measures, and project outcomes/lessons learned from this demonstration project will be documented and integrated into the RPP to ensure adaptive learning and information sharing throughout the region.

This project will demonstrate use of a mobile flame-cap kiln processing kit containing specialized portable metal kilns, otherwise known as “Ring of Fire” kilns, to process forest slash onsite. This process results in a “carbon negative” action by returning the elemental carbon (“biochar”) generated through kiln pyrolysis to the soil—either within the forest from which it was harvested or on nearby local farms. Importantly, this process can also significantly reduce smoke pollution and PM 2.5 emissions compared to use of typical open burn piles. These kilns and other similar flame-cap kilns can be manufactured inexpensively and are a replicable and open source technology that can be used at many forestry cleanup scales across the North Coast once their use is demonstrated successfully.

Sonoma Ecology Center (SEC) has three partners for this project: Usal Redwood Forest Company (URFC), Potter Valley Tribe (PVT), and Scott River Watershed Council (SRWC). Each group will demonstrate use of the kilns in their respective areas of the region and report on the outcomes and cost-effectiveness of kiln use compared to standard practices. URFC will use the kilns to process materials thinned from the Usal Forest in Mendocino County; PVT will process materials coming from an 850-acre property on their reservation, also in Mendocino County; and SRWC will demonstrate use of the kilns through their RFFC demonstration project conducted in Siskiyou County’s Scott Valley.

Data will be collected on several important aspects of the project, including labor required, approximate amounts of biomass processed and biochar produced, and information on where and how biochar was applied. SEC will work with local watershed organizations, RCD’s and forestry groups to recommend appropriate areas for biochar application, with these areas monitored for the duration of the grant period to determine apparent changes, if any, as compared to adjacent areas with no application. Additional funds will be sought to continue this research.

Task 13.1 Project Management

SEC will provide general project management, including compliance with subgrantee requirements, project planning and oversight, convening and participating in necessary meetings, as well as invoicing and reporting.

Task 13.1.A Demonstration Project Detailed Work Plan and Budget Development

Work with the NCRP staff team to develop a detailed work plan and budget based on the successful project concept proposal. This will include at least one strategic planning meeting with NCRP staff and may involve additional meetings with NCRP staff and consultants as well as other demonstration project sponsors.

Deliverable:

- This work plan and budget comprise the deliverable for Task 13.1.A.

Task 13.1.B Sub-grantee Agreement Execution and Management

Execute a sub-grantee agreement with COUNTY for work to be completed on this project. Manage the sub-grantee agreement including compliance with grant requirements, and preparation and submission of supporting grant documents.

Deliverables:

- Fully Executed Sub-Grantee Agreement

Task 13.1.C Invoicing

Compile invoices including relevant supporting documentation. Submit invoices to COUNTY according to the Subgrantee schedule presented in Table 3 below for review and inclusion in the master invoice packet.

Deliverables:

- Invoices, provided in a format approved by, and including backup documentation as specified by COUNTY

Task 13.1.D Progress Reporting

Prepare progress reports detailing work completed during reporting period. Submit reports to COUNTY according to the Subgrantee schedule presented in Table 3 below for review and inclusion in the master progress report.

Deliverables:

- Quarterly Project Progress Reports, using the format required by COUNTY

Task 13.1.E Environmental Compliance Documentation and Permitting

Humboldt County will act as lead agency for this project, seeking a CEQA exemption for this research and development (demonstration) effort. The kilns are a new, innovative method of processing forest slash in situ, and as such there are as of yet no specific regulations governing their use.

SEC will determine the need for, and acquire as necessary, any federal, state, or local permits to operate these kilns on a demonstration basis. This may require making one or more presentations on the kilns to the air quality control districts in the two counties in which they will be used (Mendocino and Siskiyou Counties). All collaborating partners have already obtained standard annual agricultural burn permits for use of the kilns. CAL FIRE and any local fire agencies will also be notified of planned kiln use.

Deliverables:

- Environmental Compliance Checklist, using the form provided by COUNTY
- Copy of applicable environmental documentation

- Copy of all required permits

Task 13.1.F Labor Compliance Program

Take all measures necessary to ensure compliance with applicable California Labor Code requirements, including, preparation and implementation of a labor compliance program or including any payments to the Department of Industrial Relations under Labor Code Section 1771.3.

Deliverables:

- Proof of labor compliance as applicable, upon request

Task 13.1.G Contractor Acquisition and Management

As applicable and based on subgrantee purchasing policies, secure contractors and award sub-contracts.

Usal Redwood Forest Company (URFC) will be subcontracted to demonstrate use of the portable field kilns within the Usal Forest in Mendocino County and to engage community participants in slash processing and biochar production application. They will prepare a report, with metrics, describing their use of the kilns. Two URFC staff members will assist SEC with this project, both with field management and reporting: Linwood Gill, Chief Forester for URFC; and Karen Youngblood, URFC Forest Conservation Specialist.

The Potter Valley Tribe (PVT) will be subcontracted to demonstrate use of the portable field kilns on land owned by PVT. Gregg Young, PVT Environmental Director, will serve as field coordinator. He will manage data collection and writing of the report on PVT's use of the kilns.

Scott River Watershed Council (SRWC) will work with Sonoma Ecology Center to demonstrate and report on the use of the portable field kilns in the Scott Valley in conjunction with their planned RFFC demonstration project. Alexis Robertson, Project Manager and Charnna Gilmore, Executive Director of SRWC, will be the primary contacts.

Kelpie Wilson and Cuauhtemoc Villa will be subcontracted as field crew trainers. Kelpie Wilson of Wilson Biochar Associates (WBA) has been pioneering use of portable kilns with forestry groups in Oregon and the US Forest Service in a number of states in the Western U.S. WBA manufactures the Ring of Fire kilns to be purchased and used in this project. Ms. Wilson will train crews on their safe and efficient use. Cuauhtemoc Villa is a Native American agronomic teacher and practitioner who has worked with SEC for the past three years in presenting Traditional Ecological Knowledge blended with modern regenerative farming techniques at biochar training events. Mr. Villa will be retained to add his unique perspective on modern uses of biochar and its history of use by indigenous peoples.

Deliverables:

- Documentation of subcontractor insurance, upon request
- Copies of subcontractor contracts, upon request

Task 13.2 Integration with NCRP Regional Priority Planning Process

This task will ensure that the project is well integrated into the RPP and NCRP planning processes for information sharing to other parts of the region. This will include at least one kickoff planning meeting with NCRP staff and subsequent meetings as needed to ensure integration of the demonstration project results.

Task 13.2.A Project Reporting

Develop a section for inclusion in the RPP that describes the project, outcomes and project applicability to the North Coast region. Provide outline, annotated outline and drafts to NCRP staff for review and input. NCRP staff may wish to interview Sonoma Ecology Center staff about the project to gather additional information for the RPP.

Evaluate economic feasibility of field kiln use based on lessons learned from demonstrations performed in various settings, taking into consideration quality, scale, and potential feedstocks.

Collect data and compile a cost-benefit analysis of the total cost of producing raw final product. Work with Scott River Watershed Council, URFC, and PVT to develop performance metrics that are achievable within the limited scope and funding of the grant and with review by NCRP staff.

Document the time and costs associated with using portable kilns to manage forest slash, including: costs to purchase, move and use the kilns in several different settings; overall labor; time to prepare biomass for the kilns versus using open burn piles; time to carry out the kiln burns; and time needed to apply the biochar to nearby soils. Collect data on estimated conversion percentage of feedstock to biochar and conduct biochar quality analysis. Debbie Page-Dumroese, a Research Soil Scientist with the Rocky Mountain Research Station of the US Forest Service who has done research on biochar in forest soils, will be consulted about soil testing BMP's, the best way to spread and where to spread the biochar, whether or not inoculation is needed, etc.

Describe and record differences in plant life and vigor in biochar-applied areas (to the degree that any such differences can be ascertained in the short grant period) versus non-applied areas through visual assessment as well as characteristics of receiving soils (before and after application). Record visual air emissions differences from open burning associated with using kilns for slash management.

Deliverables:

- Applicable data, documents, and reports on lessons learned to be integrated into the RPP: review outline, draft and final
- Performance metrics and outcomes
- Economic viability report
- Photographs and short video clips of working kilns and attendees during training and outreach events
- Where possible, differences in plant life and vigor in treated vs. untreated forest or farm locations will be shown in photographs with captions

Task 13.3 Project Activities

Test the economic feasibility of creating biochar on a large scale to address healthy forest management, reduce emissions of greenhouse gases (GHGs) and smoke, and sequester carbon through demonstration of mobile field kiln technology. Use biomass generated from fuels reduction projects conducted by project partners to produce value-added biochar for forest soil health or agricultural use. Educate the community on the potential benefits, costs, and applications of biochar through demonstration workshops developed in collaboration with SRWC, URFC, and the PVT.

When planning for meetings described below, COVID guidelines will need to be considered and may restrict the number of individuals allowed/able to participate in project work or events. Remote virtual meetings may be an alternative to holding them in person.

Task 13.3.A Field Crew Training

Train field crews in proper use of field kilns and related safety protocols. As described in Task 13.1.G, kiln developer and manufacturer Kelpie Wilson of Wilson Biochar Associates and Cuauhtemoc Villa (teacher and farmer) will present the training in Mendocino to URFC staff, PVT staff, and a crew from the California Conservation Corps. Garrett Gradillas, a trained wildland firefighter and SEC staff member who has assisted with all of the Conservation Burn trainings given by SEC over the past three years, will also be trained in use of the kilns. SEC Project Manager Raymond Baltar will also give a presentation at this training session.

Approximately 20 individuals will be trained at an initial training event in Mendocino County and 50 more at each of two subsequent events hosted by UFRC and PVT. The actual number of participants allowed/able to participate may be fewer due to COVID-19 restrictions.

Raymond Baltar and Garrett Gradillas from SEC will demonstrate use of the kilns at the SRWC Community Outreach Day.

Deliverables:

- Roster of individuals trained
- Training materials, as applicable

Task 13.3.B Field Kiln Operation

Demonstrate use of mobile field kilns to process forest slash at three locations within the NCRP region: Usal Redwood Forest in Mendocino County, Potter Valley Tribe Reservation in central Mendocino County, and Scott Valley in Siskiyou County. The goal of the project will be to generate as much biochar as possible (approximately 1 to 2 cubic yards per kiln per day—roughly 20% of biomass input) over the time that each partner has the kilns in their possession. PVT and URFC will each have the kilns for two weeks to one month. At least one kiln will also be used for a demonstration at the Community Outreach Day hosted in partnership with SRWC.

Coordinate use of the field kilns, distribution of biochar, and collection of associated data with the Usal Redwood Forest Company, Potter Valley Tribe, and Scott River Watershed Council.

Purchase and distribute all equipment (i.e. field kilns, trailer, water tank, various tools) necessary to execute this demonstration effort.

Deliverables:

- Maps, documentation, and video and/or photos of field kiln operation in each of the three project locations (Usal Redwood Forest, PVT Reservation, Scott Valley)

Task 13.3.C Public Outreach and Education

Collaborate with SRWC to develop and host a Community Outreach Day to educate the public on various small-scale methods of biochar production and their implications for forest health.

Collect outreach materials shared or developed by PVT and URFC for their respective Community Outreach Days. Provide outreach event details and dates to NCRP for inclusion in outreach and NCRP calendar.

If budget allows, the NCRP may wish to document the project via video or other mechanism to illustrate key elements of the RPP.

Leverage the social networks of SEC, SBI (Sonoma Biochar Initiative), NCRP and project partners to increase participation in outreach events.

Deliverables:

- Outreach materials shared or developed by SEC and project partners
- Photographs featuring Community Outreach Days in the Usal Forest and on the PVT property (along with video if budget allows)
- Photographs from the Community Outreach Day at Scott Valley

Task 13.4 Project Closeout

Compile a Project Closeout Packet including, but not limited to California Climate Investments (CCI) reporting metrics; a summary of contributions to NCRP goals and objectives; a section for the RPP that describes the project, outcomes and project applicability to the North Coast region; photographic documentation; final project location map, as applicable; and an RFFC Program feedback survey. Submit the packet to COUNTY according to the schedule presented in Table 3 below.

Deliverables:

- Project Closeout Packet, using the format required by COUNTY