Workplan

1. Introduction and Background/Overview

Following receipt of the EPA Climate Pollution Reduction Grant (CPRG) in Fall of 2023, the Mississippi Department of Environmental Quality (MDEQ) established a program to begin statewide implementation of greenhouse gas (GHG) emissions reduction goals of the Inflation Reduction Act. MDEQ established the Clean Air Mississippi Project (CAMP; https://cleanairmsproject.com) and developed the Mississippi Priority Climate Action Plan (PCAP).

That plan, submitted to EPA on March 01, 2024, and attached to this proposal, includes 14 emissions reduction measures distributed among seven (7) sectors (Table 1), the implementation of which will contribute to targeted GHG reductions in Mississippi. The second deliverable of the GPRG initiative is the Comprehensive Climate Action Plan (CCAP) which will be a more broad-based emissions reduction plan, in terms of spatial scale, thoroughness of technical analyses, and elevated completeness in environmental health and benefits to low-income disadvantaged communities.

PCAP Emissions Reduction Measures (MDEQ 2024)

1. Residential and commercial distributed solar generation and storage
2. Utility solar generation and storage
3. Electricity transmission and distribution upgrades
4. Cargo transportation to rail
5. Vehicle transition
6. School bus electrification
7. Alternative fueling infrastructure
8. Biofuel use for transportation or as an energy source
9. Building energy efficiency improvements
10. Refrigerant replacement
11. Forest carbon management
12. BMPs for agricultural land
13. Landfill CH4 capture
14. Wastewater CH4 capture

Moving the State forward in the interest of her citizens and contributing to global efforts in managing and reducing the load and effects of GHGs, budgetary support requested in this proposal will help with implementing and activating measures so designed. MDEQ and Mississippi State University (MSU) are partners in this submittal which includes two broad areas. First, we propose developing and implementing a program to disburse funds to interested and capable parties for executing projects with a high likelihood of reducing GHG emissions in Mississippi. Second, we offer a set of focused projects each of which is a demonstration of a technology or program that has been proven to result directly or indirectly diminishing GHG emissions. As described below, many of the projects have been developed by MSU and are eminently situated for scaling up to positively impact broader areas, both as a matter of

managing the actual sources and of extending the reach and understanding of goals, objectives, outcomes, and local and regional health and environmental benefits. In addition to achieving our GHG reduction goals, CAMP will catalyze job creation across multiple sectors. For instance, the deployment of solar arrays (Project 2.9) and the introduction of electric vehicle infrastructure (Project 2.8) are expected to generate significant employment opportunities for solar panel installers, electrical engineers, and EV maintenance technicians. These roles will not only contribute to the state's economy but will also provide high-quality, family-sustaining jobs aligned with the Good Jobs Principles.

1.1 Roles and Responsibilities

MDEQ entered into this partnership with MSU to enhance Statewide implementation of GHG reduction measures. MSU is the lead in submitting this proposal to EPA, and if favorable results are received, will be responsible for management, administration, and execution of all program activities. These responsibilities include being the lead in overall contracts management, grants administration, subcontracting, production and release of marketing materials and initiatives, and management and oversight of the grants program and individual emissions reduction projects. MDEQ will work with MSU in coordinating efforts in statewide monitoring, assessment, and reporting on the measures. They will also participate directly in developing and releasing requests for proposals (RFPs), as well as having membership on all proposal review panels. MSU will also retain outside contract support to assist MSU and MDEQ with this initiative in helping with designing and instituting the grants program, prescreening proposals, and providing miscellaneous technical support to program applicants.

Table 1. GHG reduction projects proposed for the State of Mississippi, with direct indication of linkages to the economic sectors and measures from the Priority Climate Action Plan (MDEQ 2024). Measure numbers are defined in the text box above.

Projects		Measures														Sector(s)
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
2.1	Seagrass Restoration in the Mississippi Sound											X				Land use land use change and forestry
2.2	Portable Biochar Production for Forest Restoration and Carbon Management											X				Land use land use change and forestry
2.3	Forest Infrastructure to Measure and Monitor Forest and Agricultural Carbon and Greenhouse Gas (GHG) Emissions											X	X			Land use land use change and forestry
2.4	Composite Material Recycling Demonstration									X						Building energy efficiency improvements
2.5	GHG Sequestration in Farming Methods: No Till and Cover Crops											X	X			Agriculture
2.6	Solar Powered Hydroponic Vertical Growing Demonstration Pods	X											X			Agriculture
2.7	Demonstration of Soil Carbon Sequestration Monitoring Dashboard (SCS-MD)											X	X			Agriculture
2.8	EV & Charging Station Deployment and Demonstration	X				X										Transportation
2.9	Solar Array Demonstration and Education Project	X														Electricity generation
2.10	Promoting Climate Smart Agricultural Practices											X	X			Agriculture

2. Overall Project Summary and Approach

2.1 Description of GHG Reduction Measures

The GHG reductions in this proposal are made up of two components. The first will serve to disburse grant funds in an objective and unbiased manner and support projects that will result in reduction of GHG emissions Statewide. A major focus of this program will be on creating sustainable employment opportunities. For instance, the introduction of biochar production units (Project 2.2) is projected to create new jobs in rural areas, including positions for machine operators, logistics coordinators, and forest management specialists. Similarly, the establishment of seagrass nurseries (Project 2.1) will require skilled labor in marine biology, nursery management, and environmental science, contributing to the local job market.

The second will provide funding to ongoing activities at MSU to enhance their impact and expand their spatial and temporal reach, by training a new generation of Mississippians. The impact of the second phase is through training and education of the Mississippi workforce to meet the economy-wide needs for implementing GHG reduction across various sectors spanning agriculture, transportation, energy, waste, wastewater, and Land Use Land-Use Change and Forestry (LULUCF).

2.1.1 Part 1. Developing and Instituting the Mississippi Competitive Grants Application Program for Disbursement of CPRG Funding

Funding is needed for a competitive grants program that will help establish, support, and maintain GHG reduction initiatives for the State of Mississippi. The overall purpose will be for implementation of climate action planning produced by the Clean Air Mississippi Project (CAMP), specifically detailed as GHG reduction measures in the PCAP. Given the time frame of the EPA solicitation, within a month of the publication of the PCAP, MDEQ and MSU believe this is the most open and fair process for seeking workable solutions across the state that would provide the largest and most effective GHG emission reductions and especially to fulfill EPA's goals of targeting benefits to low income and disadvantaged communities. This program seeks to solicit project ideas through a managed process of topical requests for proposals (RFP) which will go through a focused technical evaluation by a review panel, rank proposals within technical areas, determine acceptability and funding levels, schedules, and status reports. Those projects with scores and ranks as outstanding and/or excellent will be awarded subcontracts to execute proposed projects and measures. We also anticipate a non-competitive program which will solicit applications by individual homeowners, homeowners' associations, non-governmental organizations, or small businesses; the applications will be evaluated on merit with preference given to programs that directly benefit low income and disadvantaged communities. This program will provide funds for smaller focused projects such as acquisition and installation of solar arrays or EV chargers on individual homes or buildings, ecological restoration and/or pollution management and stressor reduction to enhance the capacity of ecosystems to serve as carbon sinks, and helping improve energy efficiency of homes and buildings, among others.

Goals and Guidelines

Programmatic goals will be to support comprehensive efforts in instituting and sustaining implementation of GHG emissions reduction measures (GHG/ERM). Proposals will be considered as appropriate if they are directly associated with measures put forward in a) PCAP, b) CCAP, or c) as supplemental funding to already-implemented GHG/ERM initiatives. Note, for "c", the initiatives will not necessarily be required to have begun as part of CAMP, as there are ongoing efforts independent of MDEQ, for example, development of industry-scale solar farms, residential solar, transferring cargo movement from trucks to rail, and methane-capture technology at landfills.

The program will issue proposal solicitations and guidelines that will specify either general competition, sector-specific with isolated measures, or measure-specific. RFPs will be directed toward implementation of measures for emissions reduction or sink enhancements classified within one or more of the seven (7) sectors: Electricity Generation, Transportation, Industry, Agriculture, Waste, Wastewater, and Land Use Land-Use Change and Forestry (LULUCF), including actions at the land-water interface. Review and Selection Criteria will be detailed and included in all RFP issuances, as well as directions for preparing and submitting proposals, such as:

a. Page limits
b. Required sections (intro, methods, expected outcomes, schedule, etc.)
c. Required federal or state permits or other regulatory forms (NEPA, NPDES, MS4, etc.)
d. Itemized budget and narrative
e. Qualifications of staff, management, or other participants, resumes (with page limits)
f. Pre-bid meetings, virtual, in-person, Q&A, and other administrative details such as submittal deadlines and addresses

Proposal Pre-Screening

Immediately upon proposal receipt, all proposals will be reviewed for compliance with program requirements and to ensure suitability with solicitation topic areas, specifically, the sector, measure, or other features (TBD). This initial pre-screening will be done in a manner to provide the applicant an opportunity to revise and re-submit.

Review Panel Make-Up, Qualifications, and Management

MSU and its team members will determine the necessary **expertise and qualifications** for peer review panelists. There will be up to eight (8) panel members, including one overall panel chair who will be from within the CAMP program (from MDEQ or MSU, or designee). The other seven will be outside members invited based on expertise in the sector, emissions type, and proposed measure. Individuals invited will have some combination of background in academia, industry, government, NGO, or other (at the discretion of MDEQ). Efforts will be made to have a panel-makeup representing geographic breadth of the State or emissions source type, with a balance in gender and diversity, technical expertise in not only the measure being considered, but in socioeconomic factors and environmental justice considerations.

A parallel and rigorous consideration for panel membership will be **Conflict of Interest (COI)** screening requirements. Panel members cannot review applications they or family members have submitted, nor those submitted by collaborators, co-authors, or co-workers (from the same organization). More detailed COI requirements will be developed as part of program initiation.

Peer Review Process

Although it will evolve as the program matures, the process to be used for objective and systematic review of proposals submitted will include contacting panelists, developing and distributing review forms or instructions, initiating reviews and convening the panel, summarizing reviews, determining final recommendations for awards.

The Senior Program Manager and Panel Chair will work together to coordinate schedules among all panel members, simultaneously determining whether the panel will be in-person, virtual, or hybrid. They will also be responsible for **contacting panelists** and securing commitments guaranteeing participation.

The Senior Program Manager will lead development of **forms and instructions** for ultimate use by the review panel in conducting proposal evaluations. The purpose of the structured review will be to ensure a basic level of consistency in how a proposal is handled and subjected to scrutiny, to aid in facilitating discussions within and among panel members and justify ultimate decisions and priority determinations. These forms will be distributed to panel members along with their assigned proposals six (6) weeks prior to the panel's convening.

The **term of the panel** will be determined on a case-by-case basis by the Senior Program Manager and Panel Chair, but each will last on the order of 3-5 days. The number of proposals each Panel Member is assigned for initial review will be based on the number received for the solicitation.

Panel members will review assigned proposals during the six-week interval, completing review forms in preparation for the panel meeting. On Day 1, the **review panel will be initiated** with each panel member distributing copies of the populated review forms to all panel members and doing a brief presentation. The purpose of the presentation(s) will be for each panelist to discuss their overall impression of the proposed project, how well the applicant addressed programmatic goals

and objectives, addresses technical justification, and contributes to low-income disadvantaged communities, likelihood of sustainability and success, and budget requests and justification. Following the presentation(s), the full panel will discuss merits of the proposed project, each member keeping notes and scoring in a to be determined ranking system. The final evening of the panel, the Senior Program Manager and Panel Chair will compile all review comments, summarize results to rank proposals on, for example, technical foundation, feasibility, likelihood of success, contribution to low-income disadvantaged communities, and costs. The last day of the meeting, results will be presented to the full panel, and the **final recommendations** recorded. *For proposals that are beyond the expertise and background of panel members, outside review on an ad hoc basis may be solicited.*

Award Process

Proposal documents, scoring results, and proposal recommendations will be shared with EPA for approval. Once we have EPA approval, the Senior Program Manager will be responsible for acting on panel recommendations and **contacting awardees** to inform them of review results and start the process of arranging subcontracts. During the initial notifications, requests will be made for any additional, supplemental forms or other information, with guidelines for when those forms need to be submitted (e.g., 30 days). Awards will be announced via the internet (CAMP website or other MDEQ portals).

Post Award Management

The Senior Program Manager and their team will be responsible for overall management and monitoring of project activities relative to contract terms, including progress and status reports (monthly, quarterly, annual, closeout), budget status (invoices, rates of expenditures), and monitoring any kinds of problems and sufficiency of corrective actions. There will also need to be a grants or contracts management data system that will capture financial data, following standard MSU protocols.

2.1.2 Part 2. Implementing Projects Promoting Emissions Reduction of Greenhouse Gases in Mississippi

This part of the proposal consists of 10 projects described below that will contribute to GHG reductions through their specific actions, and indirectly over a much larger footprint, through training and educating students, researchers, and technicians who will form the future workforce of the State. Each project is related to specific sectors and measures presented in the PCAP (Attachment) and Table 1.

Project 2.1 Seagrass Restoration in the Mississippi Sound

(Sector 7, Measure 11)

PCAP, Page 125 – Table 6.17; "Protect, conserve, and restore, forest, grasslands, shrublands, peatlands, coastlines."

Seagrass and Carbon Sequestration: Seagrass beds are among the most productive ecosystems on Earth, playing a vital role in maintaining coastal biodiversity and supporting numerous marine species. Seagrass beds are also instrumental in mitigating climate change through carbon sequestration. Seagrasses, like terrestrial plants, photosynthesize and absorb carbon dioxide from the atmosphere. Through this process, they capture carbon and store it in their biomass and in the sediments where they grow. Unlike many terrestrial ecosystems, seagrass beds can store carbon for centuries, making them highly efficient carbon sinks.

Seagrass Ecosystem Demonstration and Restoration Nursery: Building tanks to grow seagrass can provide a practical and effective approach to demonstrate their crucial role in carbon sequestration and underline their importance for environmental conservation efforts. These seagrass nurseries would provide an opportunity to educate the public, policymakers, and stakeholders about the importance of sea grass ecosystems in mitigating climate change. Seagrass nurseries serve as propagation centers for cultivating native seagrass species for restoration projects. By producing healthy seedlings and transplanting them into degraded habitats, nurseries contribute to the restoration and conservation of seagrass beds, enhancing their capacity for carbon sequestration.

Seagrass greenhouse at MSU's Coastal Research and Extension Center (CREC): A greenhouse with shallow fiberglass tanks holding manmade filtered seawater of varying salinities would enable seagrasses to be grown for demonstration purposes. Signage, tours, field days, etc. would incorporate this demonstration site to inform on the important role of seagrasses in coastal carbon cycling and the importance of seagrasses in contributing to the resilience of the Mississippi Gulf Coast.

Project 2.2 Portable Biochar Production for Forest Restoration and Carbon Management

(Sector 7, Measure 11)

PCAP Page 125 – Table 6-17; "Reforestation and afforestation "; "Fire Management Intervention."

Healthy forests require active forest management. This is primarily achieved by thinning forests to lower densities, which provides remaining trees with greater access to sunlight, moisture, and nutrients resulting in enhanced tree growth and carbon sequestration. One of the challenges throughout Mississippi and the Southeast is the lack of forest product markets for small- diameter trees that are cut during thinning. Without a market, there is no financial incentive to landowners, impeding forest growth and leaving stands susceptible to pests and pathogens. An emerging market for these forest products is biochar. Biochar is made from wood combusted in low oxygen environments. It can be reapplied to soils to enhance nutrient availability, water availability, and tree productivity.

Because biochar is a more stable form of carbon, it can persist in soil for millennia and act as a long-term sink for carbon. Emerging carbon credit markets consider biochar a permanent sequestration of carbon, that differs from avoidance or reduction credits, as it physically traps carbon in a stable form for long periods.

A portable biochar unit will be acquired through this funding will be used across the MSU Bulldog Forests and other landholding properties to utilize low-value forest products and provide pathways to improve soil health and leverage carbon markets. We will use the portable biochar system at 5 forest locations in the Bulldog Forest each year over 5 years to convert low-value forest products to biochar and reapply to forest soils. Each location is anticipated to represent 100 acres per year. A total of 2,500 forested acres will be impacted through this proposal, resulting in 27,000 metric tons (MT) of CO_2-eq of carbon sequestration over 2025-2030, and 182,000 MT of CO_2-eq over 2025-2050. The requested equipment will be utilized after the end of the project period to continue generating biochar and soil carbon sequestration.

Beyond forests, this infrastructure can be used in prairie restoration to remove encroaching eastern redcedar. As portable units, we can incorporate this new management option into Forestry courses, into Extension and outreach events, and into partnerships with state forest and land management agencies.

By addressing the lack of forest product markets for small-diameter trees through biochar production, this initiative pioneers a replicable and scalable approach to increase active forest management, to mitigate risks of forest degradation, and to contribute to enhanced carbon sequestration through healthy forests on a vastly greater scale than the direct benefits computed above.

Project 2.3 Forest Infrastructure to Measure and Monitor Forest and Agricultural Carbon and Greenhouse Gas (GHG) Emissions

(Sector 7, Measure 11)

PCAP Page 125, Table 6-16 & Table 6-17; "Support carbon and ecosystem services markets", "Reforestation and afforestation" and "Protect, conserve, and restore, forest, grasslands, shrublands, peatlands, coastlines."

Forest restoration and afforestation of working lands in Mississippi provides tremendous ecosystem services. Improving forest health increases forest resilience to disturbance and climate change and leads to an overall increase in carbon sequestration. However, the net benefits gained through active management can be challenging to assess. Measuring forest growth and productivity, as well as carbon cycling, is time and labor intensive, but can be rapidly streamlined with eddy covariance tower systems. These systems continuously measure the exchange of GHG and energy and water usage from forest-scale plots to provide continuous measurements of forest growth and carbon sequestration. The requested infrastructure, paired with the proposed forest carbon management, represents essential technologies necessary to inventory both GHG emissions reductions and offsets. These systems can be used to evaluate carbon management strategies throughout

Mississippi including silvicultural prescriptions on forest land and Best Management Practices (BMPs) on agricultural land. As part of this proposal, we are requesting equipment for five eddy covariance tower systems that continuously measure the exchange of GHGs (CO_2, CH_4) and energy and water usage from forest-scale plots (50-100 acres). We will treat ~750 acres per year including planting, site preparation, prescribed burning, and exotic/invasive species control to maximize forest health and carbon sequestration. A total of 3,750 acres will be impacted through this proposal. This is expected to result in 15,000 metric tons (MT) of CO_2-eq of carbon sequestration over 2025-2030, and 64,000 MT of CO_2-eq over 2025-2050.

This infrastructure will be deployed on working forest and agricultural landscapes to demonstrate carbon management strategies. Notably, we will be undertaking substantial forest restoration activities on several properties of the MSU Bulldog Forest including afforestation, prescribed fire, and exotic/invasive species control. This infrastructure will serve to quantify our positive impacts on carbon sequestration, GHG emissions reductions, and forest health. Furthermore, this infrastructure will enable on-site demonstration of how to install and operate equipment, and how to collect and report data that is are relevant to MDEQ, natural resource managers, and landowners.

Stationary GHG equipment deployed across MSU Bulldog Forest properties will provide key teaching and demonstration sites in forest carbon management. In conjunction, portable photosynthesis and GHG equipment will support monitoring efforts across diverse forest and agricultural conditions. This portable equipment will be used in Extension workshops and field days to reach broader stakeholder audiences throughout the state. Laboratory equipment to measure carbon concentrations in aboveground plant and belowground soil pools will serve to validate field observations.

The impacts this project could realize are considerable. The PCAP demonstrates that forests are already a major carbon sink in Mississippi, nearly equal to fossil GHG emissions. Sustainable forest management across Bulldog Forests will offset GHG emissions and create working forests that are resilient to disturbance and climate change. This suite of fixed infrastructure and portable measurement equipment will launch MSU's reputation as a leader in carbon measuring and monitoring in the Southeast. Data generated from this infrastructure will be collected in accordance with the National Science Foundation's National Ecological Observatory Network standards and uploaded to repositories to contribute to national-scale GHG inventories. MSU students will gain unique, hands-on experience in advanced technological practices measuring carbon. Our stakeholders throughout Mississippi will likewise benefit, by providing mechanisms to quantify carbon sequestration and participate in carbon markets.

Project 2.4 Carbon Fiber Recycling Demonstration Using Waste Heat

(Sector 3, Measure 9)

PCAP Page 116.

Composite materials, such as carbon fiber, can significantly decrease greenhouse gas emissions when replacing legacy materials. In case of automobiles, the use of carbon fiber instead of metal can reduce the weight of the vehicle and increase efficiency. However, the production of carbon

fibers themselves creates large amounts of GHG; emissions for producing a kg of carbon fiber are 24.83 kg-CO_2 eq/kg. One method to lower the carbon footprint of replacing legacy materials with composites is to use recycled carbon fibers because recycled fibers can decrease the energy consumption up to 80% compared to newly manufactured carbon fiber. This proposal is focused on implementing recycling demonstration for discarded carbon fiber materials; with the recycled product serving as a feed stock for a new generation of materials.

We propose to use a novel process to use superheated steam to remove the resin from the fibers, allowing for recycling of the fibers into novel composite structures. This process is unique because it only uses water, rather than dangerous chemicals, to recycle the fibers. Using these recycled fibers from an environmentally friendly process will significantly decrease the cost and energy consumption when producing the carbon fibers, allowing for increased adoption and lower greenhouse gas emissions. This demonstration will also use a downstream waste heat powered generator to further decrease the energy impact of composite manufacturing. Project 2.4's innovative approach to carbon fiber recycling using waste heat not only represents a significant advancement in materials science but also the creation of new jobs in recycling facilities, research and development, and composite material manufacturing. This project exemplifies our commitment to leveraging GHG reduction initiatives for economic development and job creation in high-tech sectors.

GHG reductions were estimated using projected recycled carbon fiber production and emission reduction per unit recycled carbon fiber produced. The global carbon fiber market is expected to grow from 140,000 MT and to 800,000 MT annually by 2043. Assuming the North American production capacity is 25% of global market and 1% of the North American carbon fiber production can be replaced with recycled carbon fiber from this project, the total GHG reduction is around 10,000 MT CO_2-eq over 2025-2030, and about 611,000 MT CO_2-eq over 2025-2050. These are conservative numbers as they are only based on producing the carbon fiber, not how lightweighting structures can affect GHG emissions. Furthermore, there is a compounding effect when introducing more carbon fiber into the market as it creates more carbon fiber for recycling, which leads to higher carbon fiber consumption, which leads to more recycled carbon fiber.

Project 2.5 GHG Sequestration in Farming Methods: No Till and Cover Crops

(Sector 4, Measure 12)

PCAP Page 128 Figure 6-20; "Conservation Cover", "Residue and Tillage Management, No Till/Strip Till/Direct Seed."

A demonstration project to highlight the benefits of no-till and cover crops on carbon sequestration in the soil is proposed. As part of this work, we will place four large demonstration blocks, consisting of:

1. Conventionally tilled with a fall residual herbicide (bare soil)
2. Conventionally tilled with a cover crop and no fall herbicide
3. No-till with native vegetation and no fall herbicide

4. No-till with a cover crop and no fall herbicide

All four blocks will be isolated by precision leveling the field and putting raised pads around each block to prevent water movement from one block to another. The bottom of each block will have a drainpipe with a flow meter and autosampler to measure water runoff and quality as it leaves each block. We will measure various soil properties such as organic matter to quantify carbon sequestration. Each field will be planted to the same crop within a year, but the crops will be rotated between corn, soybean, and cotton in different years. We see this as a long-term demonstration area to show the challenges and benefits of different conservation tillage and cover crop practices.

No-tillage is a conservation tillage practice in which soil disturbance is eliminated or minimized to zero for crop production. With improved C sequestration and soil health, as well as decreased N_2O and CH_4 emissions, no-tillage could potentially reduce the agricultural emissions by 396 MT CO_2-eq per 1,000 acres of cropland in Mississippi. Cover crops are the plants typically grown between two cash crop production or during fallow periods for improved ecosystem services, for example, cereal rye, oats, barley, legumes (hairy vetch, pea, and clovers), brassicas (radishes, turnips), and mixture of species. It has been estimated that cover crops could mitigate 687 MT CO_2-eq per 1,000 acres in Mississippi. Deploying no-tillage and cover-crops practices to 20,000 acres of cropland (10,000 acres each) therefore leads to 54,000 MT CO_2-eq over the six-year period from 2025-2030, and 271,000 CO_2-eq over period of 2025-2050.

MSU works with the National Black Growers Council (NBGC) on multiple demonstration projects showcasing the agroecological and environmental benefit(s) of cover crops, nutrient management strategies, no-tillage and reduced tillage production systems. The NBGC was organized to represent the unique needs of over 500 full-time Black row-crop farmers. Live/virtual meetings will be held on NBGC demonstration sites during the growing season and in conjunction with the NBGC's annual meeting. The underserved farmer-to-farmer network will also conceptualize or refine methods to promote precision agricultural technologies that improve nutrient stewardship and crop productivity with a particular focus on how to reach the Historically Underserved farming community. Project 2.5 will revolutionize our approach to agriculture, introducing climate-smart practices that are expected to create new opportunities for agronomists, soil scientists, and GHG monitoring specialists. By implementing advanced soil management and no-till farming techniques, we will not only enhance crop productivity and sustainability but also foster job growth in agricultural consultancy, technology implementation, and environmental monitoring, ensuring that these positions are supported by comprehensive training programs to meet the highest standards of job quality and sustainability.

Project 2.6 Solar Powered Hydroponic Vertical Growing Demonstration Pods

(Sector 4, Measures 1, 12)

PCAP Pages 86, 128 Figure 6-20; "Nutrient Management ", "Roofs and Covers."

Demonstrating small-scale hydroponic systems that can be used for year-round production of leafy greens, the vertical growing demonstration pod will utilize hydroponic based nutrient and water

delivery systems in a closed-loop container system. With minimal water inputs, the system will grow produce in a vertical orientation and use high efficiency LED lights to deliver light needs during an extended day to maximize production and minimize resource inputs. To further reduce carbon inputs, the system will be connected to a solar array, inverter, and battery system to offset the need for coal generated, grid power. The teaching and demonstration pod will be managed by students to grow produce for on-campus dining halls and food pantries. Located on a research station near the Mississippi State University campus, the Pods will be able to host thousands of college students, local school children, farmers and stakeholders who are interested in the technology.

Project 2.7 Demonstration of Soil Carbon Sequestration Monitoring Dashboard (SCS-MD)

(Sector 4, Measure 11, 12)

PCAP Page 125: Table 6-16 & Table 6-17; page 128: Figure 6-20; "Support carbon and ecosystem services markets", "Reforestation and afforestation", and "Protect, conserve, and restore, forest, grasslands, shrublands, peatlands, coastlines", "Nutrient Management."

A significant disconnect exists between how growers manage their land and the growing industry's need for carbon sequestration reporting, stemming from a combination of factors on both sides. Limited awareness, focus on short-term profitability, lack of incentives, and other technical challenges are some of the pertinent growers' perspectives. However, the industry's perspective on evolving regulations, cost, complexity, and limited knowledge and interaction with real stakeholders aggravate this problem. Demonstration on field and soil sampling-based direct measurements of carbon can provide precision and straightforward assessment. Still, they lack the potential for large-scale application due to labor intensiveness, economic inputs, agroclimatic factors, and soil variability. A comprehensive approach that combines cutting-edge remote sensing technologies using artificial intelligence is required to address this challenge on a geospatial scale. Therefore, we propose to demonstrate the estimation of carbon stocks in agricultural soils and forestry using a combination of remote sensing and an artificial intelligence (AI)-based carbon climate interaction dashboard. This innovative approach holds immense potential to revolutionize carbon monitoring and contribute significantly to sustainable land management practices and is tied to the other proposed projects in this package, specifically Projects 2.5 and 2.10. The approach is as follows:

- To demonstrate models to assess and evaluate carbon sequestration activities to get growers' feedback on data assimilation and evaluation of regenerative agriculture practices.
- To foster collaboration between agricultural and forestry stakeholders, policymakers, and climate experts to promote sustainable land management practices in compliance with carbon credit programs and establish a carbon network via stakeholder engagements.

This dashboard will be user-friendly and integrated into the project website and made available to the general public.

Project 2.8 EV and Charging Station Deployment and Demonstration

(Sector 2, Measures 5, 7)

PCAP Page 116.

The general public has a limited understanding of EV performance and costs. This is due at least partly to a lack of relevant demonstration. We propose deploying and demonstrating 74 vehicles (25 Standard Range Class II Trucks, less than 400 mi range; 27 Extended Range Class II Trucks, greater than 400 mi range; 16 Class II Trucks designed for Public Safety; 6 Sport Utility Vehicles), 11 tractors, and 6 utility task vehicles across multiple locations and applications throughout Mississippi. These include, agriculture, landscaping, public safety, and others. By providing demonstrations under real conditions and fact-based literature, we believe that the technologies will be de-risked to end consumers, therefore increasing uptake of the technologies and decreasing GHG emissions.

Since these types of vehicles as a class are among the highest contributors to GHG emissions in Mississippi, this has the potential to have a transformative impact on the future use of electric vehicles in Mississippi. MSU vehicles will be inventoried by relevant departments. Vehicles issued to non-MSU entities, will be the responsibility of the receiving agency under an agreement with MSU. Two of the vehicles will be converted for use by the T.K. Martin Center, for the purpose of instructing individuals with disabilities. Cost for this project also includes the purchase and installation of 48 level II chargers and 5 level III chargers.

Project 2.9 Solar Array Demonstration and Education Project

(Sectors 1, 3, Measure 1)

PCAP Page 86.

Demonstrating Sustainable Practices: Installing multiple solar panel arrays at across diverse properties owned by MSU across the state, with a particular focus on low income and disadvantaged communities, we send a powerful message about our commitment to developing non-fossil sources of electric power. As a research institution dedicated to understanding and conserving our natural resources, it is imperative that we lead by example. By visibly adopting renewable energy solutions, we inspire our peers, collaborators, and the broader community to follow suit, fostering a culture of environmental responsibility within Mississippi and our stakeholders.

Support for Student Engagement and Training: Engaging with students and the public in informal education environments, is an integral part of our research mission. Implementing a solar panel array not only benefits our facilities but also serves as a student outreach tool. The various types of solar arrays installed will serve as a laboratory for students to learn about monitoring systems through an interactive Kiosk system following energy use in real time. It will also encourage students to seek careers in implementing solar power systems, which is expected to be a major need in the near term as more solar facilities are installed statewide.

Reliability and Independence: In summary, incorporating a solar panel array and EV infrastructure at different locations aligns with our commitment to environmental stewardship, financial sustainability, and community/student engagement. This initiative not only reduces our carbon footprint but also positions our state as a leader in adopting eco-friendly solutions, setting a positive example for the natural resource agencies we work with and society at large. The long-term benefits of cost savings, reliability, and independence from traditional power sources make this investment a sound decision for the future success of our outreach and educational endeavors within Mississippi.

Project 2.10 Promoting Climate Smart Agricultural Practices

(Sector 4, Measure 12)

PCAP page 128, Figure 6-20; "Nutrient Management."

Transferring strategies required to reduce greenhouse gas (GHG) emissions from row-crop production fields will require research-based information, demonstration sites and educational programming targeting agricultural producers and affiliated stakeholders. In 2023, MSU constructed a long-term corn, cotton, and soybean outreach site whereby the agroeconomic and environmental benefits of novel water, soil, and GHG management tools, technologies, and approaches can be demonstrated to the public. To that end, we intend to procure automated smart flux chambers and gas analyzers from LI-COR Biosciences that can continuously measure the GHG effluxes from row-crop production fields. The equipment particularly includes a suite of 27 long-term, automated flux chambers, 3 in-situ CH_4, CO_2, and N_2O trace gas analyzers, and 3 gas flow multiplexers to evaluate regional cropping systems under diverse management practices. Founded on our preliminary production systems research, we will demonstrate that by integrating crop rotation, narrow-row planting, and banded fertility applications into an irrigated, stale seedbed production system we will reduce GHG losses up to 50% while improving corn, cotton and soybean productivity and profitability up to 20% relative to the producer's standard production system.

2.2 Demonstration of Funding Need

Mississippi stands at a pivotal juncture in its GHG reduction journey. Despite possessing vast potential for implementing GHG reduction measures, we have historically lagged in deploying such initiatives due to a complex interplay of economic, social, and infrastructural challenges. This proposal underlines what we believe is a compelling need for CPRG implementation funding, crucial for catalyzing the state's GHG reduction efforts, which remain largely untapped due to limited financial resources and the nascent stage of our environmental programs.

Our diligent search for and exploration of other federal and state grants, tax incentives, and funding sources reveals a landscape where existing funding mechanisms are either insufficient or misaligned with the unique demands of Mississippi's GHG reduction endeavors. For instance, while the EPA's GHG Reduction Fund and the Solar for All program offer promising avenues for support, our projects' scale, scope, and the immediacy of need exceed what these sources can fulfill, especially when considering the comprehensive approach required to significantly impact our statewide GHG emissions.

To date, our search for GHG measures has included but has not been limited to, applications and inquiries into funding opportunities outlined in the White House's Bipartisan Infrastructure Law (BIL) Guidebook and the Inflation Reduction Act (IRA) resources. We are also looking for funding opportunities that are in alignment with the White House's Justice40 initiative, in particular seeking collaboration with other State-level agencies. These efforts have yielded partial funding avenues for select projects, such as preliminary commitments for solar array installations and educational outreach initiatives. However, these funds fall short of covering the comprehensive needs of our proposed GHG reduction measures, particularly in areas requiring specialized research, infrastructure development, and the deployment of innovative technologies across both urban and rural settings in Mississippi.

Moreover, the CPRG funding is critically needed to bridge the gap between partial funding sources and the total investment required to make substantial progress in GHG reductions. For example, while tax incentives have eased some financial burdens associated with renewable energy projects, they do not address the upfront costs of implementing large-scale seagrass restoration or the development of state-wide biochar production capabilities, both integral to our GHG reduction strategy in a predominantly rural state.

In summary, Mississippi's unique environmental, economic, and social landscape presents both challenges and opportunities in the quest for GHG reduction. The CPRG implementation funding stands as a vital lifeline, enabling us to leverage partial funds and incentives while addressing the unmet need for comprehensive, statewide environmental initiatives. Through this funding, Mississippi aims to not only catch up with but also lead in innovative and impactful GHG reduction measures, setting a precedent for sustainable development that aligns with our state's needs and potential.

2.3 Transformative Impact

Leveraging the detailed scope and innovative approaches outlined in our proposal, the MDEQ and MSU partnership aims to pioneer transformative opportunities in GHG emission reductions that can serve as a national model. First, we intend to use a large fraction of this funding to solicit additional proposals statewide that would meet the CPRG's goals and allow implementation of broad swathe of projects reflected in the different reduction areas in Mississippi's PCAP. Beyond this call, the proposed projects embody scalable, replicable policies, and programs across sectors where GHG reduction has been traditionally challenging, thereby addressing the critical gap in hard-to-abate areas. For instance, our initiatives like the Portable Biochar Production for Forest Restoration and Carbon Management and the Solar Powered Hydroponic Vertical Growing Demonstration Pods are set to revolutionize the forestry and agriculture sectors by introducing sustainable, yet economically viable practices that significantly reduce carbon footprints. Furthermore, the deployment of Electric Vehicle and Charging Station Infrastructure represents a market transformation strategy, aimed at accelerating the adoption of EV technologies in transportation, a sector ripe for GHG emission reductions in Mississippi. These measures, combined with our comprehensive approach to training, public engagement, and infrastructural development, ensure that the impacts of our GHG reduction efforts extend beyond immediate emission reductions to foster long-term, sustainable changes in

how GHG mitigation is approached statewide. Through this proposal, we are not only targeting immediate GHG reductions but also facilitating a broader market transformation that encourages the adoption of emerging technologies and practices, positioning Mississippi as a leader in environmental stewardship and economic resilience.

3. Impact of GHG Reduction Measures

The MDEQ and MSU team, through the Clean Air Mississippi Project (CAMP), has designed GHG reduction measures that represent a significant leap towards Mississippi's sustainable future. These measures are anticipated to achieve substantial GHG emission reductions, demonstrating exceptional cost-effectiveness and long-term sustainability.

3.1 Magnitude of GHG Reductions from 2025 through 2030

The cumulative GHG emission reductions from 2025 through 2030, as a result of selected proposed measures under the projects in Part 2, are shown below. Additional emission reductions will be obtained from projects that will be funded through the approach described in Part 1. Furthermore, the framing of many of our projects as demonstrations is expected to lead to broader adoption in other locations statewide with resulting GHG reductions that cannot be directly estimated for this proposal, although a significant multiplier effect is expected. The emission reductions quantified in Table 2 are thus a subset of the total statewide emission reductions that will result from this proposal.

Table 2. Magnitude of GHG Reductions from 2025 through 2030 (rounded to the nearest 1000 MT). Additional details on these calculations are presented in two appendices to this work plan (technical appendix and emission reduction spreadsheet calculations).

Selected Measure	2025-2030 Reduction, in MT CO_2-eq	2025-2050 Reduction, in MT CO_2-eq
Project 2.2 Portable Biochar Production for Forest Restoration and Carbon Management	27,000	182,000
Project 2.3 Forest Infrastructure to Measure and Monitor Forest and Agricultural GHG Emissions	15,000	64,000
Project 2.4 Carbon Fiber Recycling Demonstration Using Waste Heat	10,000	611,000
Project 2.5 GHG Sequestration in Farming Methods: No Till and Cover Crops	54,000	271,000
Totals from Selected Projects	106,000	1,128,000

3.2 Magnitude of GHG Reductions from 2025 through 2050

From 2025 through 2050, the proposed GHG reduction measures are projected to continue their impactful contribution as shown above, solidifying Mississippi's commitment to reducing emissions. While specific long-term quantitative estimates will require additional modeling in future work, the durable nature of the projects—such as sustainable land management practices, carbon sequestration through biochar, and the transition to renewable energy sources—ensures that these initiatives will continue to yield GHG emission reductions well beyond 2030.

3.3 Cost-Effectiveness of GHG Reductions

The cost-effectiveness of the GHG reductions anticipated from our suite of measures underscores the strategic allocation of CPRG funding. By leveraging existing state, federal, and private investments, and focusing on a wide range of demonstration projects with a multiplier effect on GHG reductions, the requested CPRG funding represents a highly efficient investment in Mississippi's green future. The estimated direct GHG reductions from this funding, from only a subset of the identified projects is expected to be 1.485 million MT of CO_2-eq over 2025-2050; and this does not count for many other projects on this list, as well as future Part 1 projects which are not specifically identified at this point in our implementation plan. Additional indirect reductions are expected from the demonstration projects by encouraging wider adoption of more GHG efficient technologies statewide, although these also cannot be quantified at this time. Together, we expect GHG reductions to be much greater that the 1.485 million MT CO_2-eq documented above.

3.4 Documentation of GHG Reduction Assumptions:

The methodology and assumptions underpinning our GHG emission reduction estimates are detailed in the accompanying technical appendix, utilizing methodologies from the PCAP or from the scientific literature.

4. Environmental Results – Outputs, Outcomes, and Performance Measures

The Mississippi CAMP team considers this entire effort as ultimately contributing to reductions in GHG emissions Statewide, improving near-term/near-field health effects on local communities, more broadly enhancing ecological capacity as carbon sinks, adding to workforce capacity, and ultimately, contributing to regional, national, and global initiatives aimed at controlling the primary driver of climate change. Cumulative effects of the 10 **proposed projects** will lead to increasingly effective reductions in the magnitude of emissions of GHG, criteria air pollutants (CAP), and hazardous air pollutants (HAP). The proposed projects are directly related to five of the measures in the Mississippi PCAP, as follows:

Table 3. Projects in this Proposal are Directly Related to These 5 Measures from the Mississippi PCAP.

No.	PCAP measures
1	Residential and commercial distributed solar generation and storage
5	Vehicle transition
9	Building energy efficiency improvements
11	Forest carbon management
12	BMPs for agricultural land

4.1 Expected Outputs and Outcomes

For each of the 10 proposed projects, we estimate a total GHG reduction of 190,310 metric tons of CO_2 equivalent by 2030, directly contributing to the Statewide ambition of reducing greenhouse gas emissions by 2030. Although direct quantification of CAP and HAP reductions is beyond the scope of our initial application, our monitoring plan includes mechanisms to track these emissions, with a focus on demonstrating measurable improvements in air quality within disadvantaged communities. Project 2.8, in addition to reducing GHG emissions by transitioning to electric vehicles, is projected to create over 100 new jobs in the renewable energy sector, providing significant economic benefits to low-income and disadvantaged communities through job creation and energy savings.

As an example, the annual estimated per building reductions in GHG emissions with installation of distributed solar systems in residential and commercial structures (**Measure 1**) are 5.4 and 72.4 MT CO_2-e, respectively (MDEQ PCAP 2024). The three projects contributing to this measure are *Solar Powered Hydroponic Vertical Growing Demonstration Pods* (Project 2.6), *Electric Vehicle & Charging Station Deployment and Demonstration* (Project 2.8), and *Solar Array Demonstration and Education Project* (Project 2.9). Similarly, co-benefits to the environment are realized by reductions in other air pollutants, such as sulfur dioxide (SO_2) and oxides of nitrogen (NO_x). With installation and operation of solar energy capabilities, annual per building reductions are estimated to be 0.5kg and 6.6kg of SO_2 for residential and commercial buildings, respectively. That for NO_x is 2.5kg and 33.7kg, respectively. The Mississippi CAMP team's comprehensive approach to reducing GHG emissions extends to fostering job growth in sectors critical to our state's future. For example, the solar-powered hydroponic vertical growing demonstration pods (Project 2.6) will not only advance agricultural efficiency but also create jobs in agricultural technology, sustainable farming, and educational outreach. These jobs will be characterized by fair wages, benefits, and the opportunity for workforce development and training.

4.2 Performance Measures and Plan

To track progress toward our environmental goals, we will utilize a combination of satellite imagery for land use changes, energy consumption data from local utilities, and air quality monitoring data to quantify reductions in GHG, CAP, and HAP emissions. The effectiveness of each GHG reduction

measure will be evaluated annually against our established benchmarks using a mix of quantitative data (e.g., metric tons of CO_2-e reduced) and qualitative assessments (e.g., community health surveys), ensuring adaptive management of our projects to meet or exceed expected outcomes. These projects are proposed as demonstrations with a goal of expanding public and policymaking recognition and acceptance, scaling their application and use to increasingly broader spatial coverage. We hope and anticipate that as acceptance becomes more pervasive use of distributed solar will become the norm. Further, the reduced reliance on combustion of fossil fuels for energy that will result will contribute to substantial reductions in the production of CAP and HAP, thus providing health benefits Mississippi residents in general, and more specifically to low-income disadvantaged communities which often have elevated exposure risks. In terms of reporting for Measure 1, metrics can be used to summarize the status and trends of the numbers and percentages residential and commercial buildings with and without solar generation and storage. Similar benefits will be realized through implementation of the other measures.

Several measures identified by the PCAP analysis are not directly addressed or represented by any of the 10 projects (see Table 1, of the proposal "Technical Approach/Workplan"). The goal of the Mississippi Competitive Grants Application Program for Disbursement of CPRG Funding is to solicit and fund projects and program initiatives which will ultimately lead to the full complement of measures being addressed. We anticipate that not only will grants be used for new projects, but they will also help in linking up, enhancing, and broadening ongoing projects.

4.3 Authorities, Implementation Timeline, and Milestones

The Mississippi CAMP team, including MDEQ, MSU, and contractor support, will oversee project implementation, with MDEQ responsible for regulatory compliance and monitoring, and the CAMP team handling community engagement and education efforts. We have secured preliminary agreements from all necessary governmental bodies and are in the final stages of obtaining formal authority to implement measures 1, 5, and 9, with an anticipated timeline to commence all projects by Q2 2025 and reach key milestones by Q4 2027. MDEQ's statement on "Statutory Authority for Implementing" is included right after the front cover of the PCAP. To ensure the success of our GHG reduction measures, we have established a strong partnership with several labs and divisions at MSU for monitoring and reporting support, engaged with community organizations for outreach, and are in discussions with industry leaders for technological and financial support. Further, we intend to explore a smaller sub-component grants program that can assist individual homeowners and small businesses with installation and maintenance of sustainable energy systems.

In addition to Measure 1, *Electric Vehicle & Charging Station Deployment and Demonstration* (Project 2.8) contributes to **Measure 5** (Vehicle transition). This transition to EV will result in annual GHG reductions of 76,100 MT CO_2-e in 2020 to 96,200 MT CO_2-e in 2030. These numbers are based on estimates of transitions of 6,000 vehicles. The pace of transitioning is tied to costs not only of the vehicles themselves, but also convenience of the charging infrastructure and efficiency of recharging. Many of the benefits have been discussed above, demonstrating the cross-cutting nature of several measures and GHG reduction activities.

Carbon Fiber Recycling Demonstration Using Waste Heat (Project 2.4) relates to **Measure 5** (Vehicle transition) and **Measure 9** (Building Energy Efficiency Improvements), specifically to enhance the capacity in Mississippi of composites production through existing technology in materials recycling. This technology can have a transformative impact. Reducing the weight of battery-powered EVs (BEV) will improve the "attractiveness" of a cultural transition to EV ownership and use in several ways. By using stronger and lighter materials there are increases in not only the safety of the vehicles, but also in efficiency of operations (charges last longer) and reductions in environmental impact from mining and drilling. The technology exists and is waiting to be scaled up to have a greater reach throughout the state and region. By scaling up the composite recycling technology there will be significant energy savings; recycling composites can produce fibers with 80% lower CO_2 emissions. Current GHG emissions for producing a kg of carbon fiber are 24.83 kg-CO_2-e/kg. The carbon fiber market is expected to grow from ~140,000 MT and grow up to 800,000 MT annually. If only 2% of this market is recycled carbon fiber, this could decrease annual GHG emissions 6,600 MT CO_2-eq annually (or 39,600 MT CO_2 eq over 2025-2030). Additionally, the expected significant increase in market demand will significantly trump the market supply. The only way to economically address the growth is through recycling of composites. "Recycling" often comes in the form of burning the composite for energy or using harsh chemicals to strip the resin from the reinforcement. Our proposed recycling process uses only super-heated steam to remove the resin. The steam can be generated from waste heat from a local steel mill and the produced steam can be used to power a generator.

Two of the Mississippi PCAP measures, **Measures 11** and **12** (Forest carbon management, and BMPs for agricultural land) are addressed in part by six of the projects (Table 4).

Table 4. Mississippi PCAP Measures 11 and 12 Addressed in part by Six of the Projects.

Project No.	Project Name
2.1	Seagrass Restoration in the Mississippi Sound
2.2	Portable Biochar Production for Forest Restoration and Carbon Management
2.3	Forest Infrastructure to Measure and Monitor Forest and Agricultural Carbon and Greenhouse Gas (GHG) Emissions
2.5	Climate-Smart Agricultural Practices: Farming Methods and GHG Monitoring
2.6	Solar Powered Hydroponic Vertical Growing Demonstration Pods
2.7	Demonstration of Soil Carbon Sequestration Monitoring Dashboard (SCS-MD)
2.10	Promoting Climate Smart Agricultural Practices

Many of these projects are in either or both of the sectors: a) Land use land use change and forestry and b) Agriculture. They serve to increase the efficiency of crop production (higher yields, lower energy requirements), dramatically enhancing the capacity of forestland and agricultural systems to function in carbon sequestration and monitoring for objectivity in data acquisition and

management decision-making. decision-making. Our overarching strategy ensures that the CPRG-funded projects serve as a catalyst for job creation across Mississippi, providing high-quality, family-sustaining employment opportunities. By prioritizing projects that offer substantial training components, such as the soil carbon sequestration monitoring dashboard (Project 2.7), we are preparing the Mississippi workforce for the future, emphasizing jobs in data analysis, remote sensing technology, and environmental science.

5. Low-Income and Disadvantaged Communities

5.1 Community Benefits

All proposed projects will result in direct and/or indirect reductions in emissions of GHG, CAP, and HAP. As such, there are direct human health benefits to low-income and disadvantaged communities who tend to have an increased risk of exposure to these detrimental pollutants because of proximity to sources, their homes, communities, and places of business.

Forest Carbon Management (PCAP Measure 11) is supported by several of the proposed projects, specifically 2.1, 2.2, 2.3, 2.5, 2.7 and 2.10 (see Table 1, above). Conservation of forests and other undisturbed ecosystems can be designed to optimize benefits to low income/disadvantaged communities, specifically helping improve the local air and water quality, and other environmental features. The overall the quality of life is improved, even helping create local employment opportunities related to forest management, providing important benefits to these communities, and can increase property values. Some of the employment opportunities expected are in the forestry industry, and can include hiking, hunting, fishing, outdoor activities, tourism, and other related fields. The portable biochar system (Project 2.2) will be used on Bulldog Forest Properties throughout the state of Mississippi and will be used to engage landowners with emerging forest carbon management techniques.

The Mississippi Water Resources Research Institute (MWRRI) works with the National Black Growers Council (NBGC) on multiple demonstration projects showcasing the agroecological and environmental benefit(s) of cover crops, nutrient management strategies, no-tillage and reduced tillage production systems (Project 2.6). The NBGC was organized to represent the unique needs of over 500 full-time Black row-crop farmers. Live/virtual meetings will be held on NBGC demonstration sites during the growing season and in conjunction with the NBGC's annual meeting. The underserved farmer-to-farmer network will also conceptualize or refine methods to promote precision agricultural technologies that improve nutrient stewardship and crop productivity with a particular focus on how to reach the Historically Underserved farming community. Additionally, with Project 2.7 and through the Extension network based in all 82 counties of Mississippi, MSU MAFES (Mississippi Agricultural and Forestry Experiment Station) and Extension personnel have a history of success serving low-income and disadvantaged communities. Additionally, existing relationships with our HBCU partners, such as Alcorn State University and Jackson State University,

provide additional opportunities for engagement within these communities. Through the proposed project, meaningful engagement will lead to authentic collaborations for consideration and implementation of BMP strategies. In addition to the co-benefits that will come with Project 2.8, including reduced operating costs of small businesses, two of the requested vehicles will be upfitted for use by the T.K. Martin Center to teach driving skills to disabled individuals.

Implementation of the Project 2.9 demonstration of solar generation on existing properties, will encourage low income/disadvantaged communities to seek higher incentives and investments and leveraging funding and resources from existing federal programs, this reduction measure could be expected to provide substantial benefits to these communities. EPA's Solar for All program, for example, aligns with objectives of this reduction measure and presents substantial opportunities to subsidize the installation costs of small-scale solar systems in low income/ disadvantaged communities. The installation of small-scale solar systems serves as a valuable means to provide affordable electricity, whereas the promotion of solar system installations can lead to job creation for low income/disadvantaged communities. Adding small-scale solar systems can also provide a local energy source, increasing the energy resilience during periods of grid failures during extreme weather events. Overall, this reduction measure is expected to greatly facilitate and promote a just and equitable energy transition.

5.2 Community Engagement

MSU will work through its extension network based in all 82 counties of Mississippi, MSU MAFES and Extension personnel have a history of success serving low-income and disadvantaged communities. Existing relationships with our Historically Black Colleges and Universities (HBCU) partners, such as Alcorn State University and Jackson State University, provide additional opportunities for engagement within these communities. Through the proposed projects, meaningful engagement will lead to authentic collaborations for consideration and implementation of BMP strategies.

Extension faculty in the Department of Forestry will host field days and workshops that will enhance stakeholder knowledge of forest carbon management and explore ways for private individuals to engage in biochar markets for carbon offset credits. The potential educational aspect to all projects, goals, objectives, and outcomes, carries a huge benefit if realized in increasing concern for the environment and stewardship activities. The ability to collect GHG emissions reduction data at local levels in real time (Project 2.3) will allow us to use MSU Bulldog Forest sites and associated data for public outreach and engagement. Locally relevant data will support increasing awareness and knowledge of stakeholders about climate-change, how land-management practices influence GHG emissions, and best practices for reducing GHG emissions. The local data will serve as a critical element of community engagement and increasing involvement in water and land stewardship and other activities. We anticipate engaging stakeholders through field days, digital media, and print materials.

6. Job Quality

In alignment with Executive Order 14082 and the guiding principles of the Inflation Reduction Act of 2022, the Mississippi CAMP team is committed to ensuring the CPRG-funded projects not only contribute to significant GHG reductions but also foster the creation and support of high-quality, family-sustaining jobs. Our approach to job quality is comprehensive, emphasizing both the number and the quality of jobs, ensuring they offer fair wages, benefits, and the right to organize. **Strategies for High-Quality Job Creation:**

Wage Standards: We commit to paying at least the median area income for all workers involved in the CPRG projects, ensuring our compensation exceeds the prevailing wage requirements where applicable. This approach ensures that the jobs created are not just new but are genuinely capable of supporting families in Mississippi.

Benefits and Retirement Contributions: Our procurement and contracting processes will require all employers, including contractors and subcontractors, to provide family-sustaining benefits and meaningful retirement contributions to their employees.

Union Representation and Collective Bargaining: We actively support employees' rights to join a union and will engage in formal partnerships with labor organizations. This includes facilitating voluntary recognition and majority sign-up processes, and ensuring all contractors commit to neutrality in union organizing efforts.

Project Labor Agreements (PLAs): For substantial construction projects under the CPRG, we will utilize PLAs and Community Workforce Agreements to promote fair labor standards and union involvement, enhancing job quality and project efficiency.

Labor Standards in Procurement: Labor and job quality standards will be integral to our procurement activities, ensuring that all aspects of GHG reduction measures reflect our commitment to high-quality jobs.

Health and Safety: In collaboration with workers, we will develop comprehensive health and safety plans, including anti-harassment training and OSHA training, to ensure a safe working environment for all.

Registered Apprenticeship Programs: To expand our skilled workforce, at least 10% of total labor hours on each project will be allocated to qualified apprentices, fostering skill development and job quality, directly facilitated by the MSU Extension Offices' decades of experience.

Second-Chance Hiring: We are committed to inclusive hiring practices, including the employment of individuals with past justice-system involvement, expanding opportunities and supporting community reintegration.

Community Hiring Goals: Specific benchmarks and goals will be set to hire individuals from disadvantaged communities (approximately 70% of Mississippi census tracts are considered disadvantaged), ensuring our projects contribute to equitable economic growth.

Supportive Services: Recognizing the diverse needs of our workforce, we will provide supportive services such as childcare and transportation assistance to remove barriers to employment.

Employment Stability: Our projects will prioritize stable, long-term employment opportunities, minimizing reliance on temporary or contract workers and ensuring proper worker classification.

Collaboration and Commitment: We are engaging with the state Department of Labor, the State's Workforce Board and Accelerate Mississippi, labor unions, and workers' rights groups to refine and implement these strategies. These partnerships underscore our commitment to not only creating jobs but ensuring these jobs are of high quality, offering fair wages, safe working conditions, and the opportunity for collective bargaining. Letters of commitment from our labor partners are attached as optional attachments, demonstrating our collaborative approach to job quality.

7. Programmatic Capability and Past Performance

Mississippi State University is classified among "R1: Doctoral Universities – Very High Research Activity" institutions and has an annual research and development budget of over $300 million, the largest in Mississippi. Because of this large amount of activity, we have a robust controls process for managing and successfully completing awards of sizeable amounts and scope. Mississippi State University is not delinquent on any federal debt, nor is Mississippi State University presently debarred, proposed for debarment, declared ineligible or voluntarily excluded from any covered transaction by a federal department or agency. Examples of federally funded assistance agreements are as follows:

United States Department of Agriculture *_"Optimization of molluscicidal treatment strategies to disrupt trematode live cycles in catfish aquaculture pond"_ * USDA ARS 58-6010-0-01 and 10.001 * Investigate molluscicidal treatment strategies to disrupt trematode life cycles in catfish aquaculture ponds and mitigate economic losses associated with trematode pests. * Linda P. Robinson E-mail: linda.robinson@usda.gov

National Oceanic and Atmospheric Administration.*"_The potential for conservation grazing in coastal uplands."_ NOAA NA21NOS4510181 and 11.451 *Improving management of coastal ecosystems through identifying and addressing research needs for management. * Jennifer Hinden E-Mail: jennifer.hinden@noaa.gov

National Science Foundation"b{C L ¦ {9Y D t℔ a t ! / ¢Y DŜ2ăÕλŜyÕŜă {úNŜI·YfλyŜŘ tλLJŜfλyŜ ! yŘ wŜăŜI·NŎK ₮2N /2YYdzyλűè /2ftŜƎŜă óDŜ2π{t ! w//úɛ NSF 1801306 and 47.050 Develop a pathway from 2 year to 4 year institutions via online instruction and ementoring.Christine Castell Email: ccastell@nsf.gov

National Institutes for Health¦á ¦ yŘŜNăúI·yŘλyƎ űKŜ NŜƎdzfI·ű2Nè N2fŜ 2₮ I· Ŝdz⟦I·Nè2űλÕ űNI·yãÕNλLJűλ2Y₮I·Ôű2N λY wb ! ℔ű$YLJtI·ű$Ř úNI·yãÕNλLJűλ2λYÕI·ű$I·fèĪ$Ř ōè 5b ! ℔ŘλN$ÕűŜŘ wb ! LJ2fèYŜNI·ăŜ LLɛNIH R15GM135893 and 93.859 understand the role of a eukaryotic transcription factor in regulating RNA-templated transcription catalyzed by RNA polymerase IISusan F. South Email: southsf@mail.nih.gov

United States Department of Agriculture á9₮₮ŜÕű 2₮ YλÕN2ÕèăúλY[w ŜÈLJ2ădzNŜ 2YűKŜ ădzăÕŜLJűλōλfλűè 2₮ ÕKI·yýŜf ÕI·ű₮λăK ű2 YλÕN2ōλI·f ŘλăŜI·ăŜăɛUSDA NIFA 2019-67016-29917 and 10.310 Evaluate the influence of microcystin LR on the outbreaks of infectious diseases. Bruce Mertz Email: bmertz@nifa.usda.gov

8. Budget

Our project proposes a total budget of $83,817,426 to fund a variety of PCAP supporting projects. A detailed budget and narrative are attached as requested