

Virginia Department of Environmental Quality and Virginia Energy Coalition Application for U.S. Environmental Protection Agency Climate Pollution Reduction Implementation Grant

Priority Methane Reduction Projects in Virginia

April 1, 2024

Work Plan

1. OVERALL PROJECT SUMMARY AND APPROACH

The Virginia Department of Environmental Quality (DEQ), in a coalition with Virginia Energy (VA Energy), proposes to undertake the greenhouse gas (GHG) reduction efforts described in this workplan for **Priority Methane Reduction Projects in Virginia**. With implementation funding awarded under the U.S. Environmental Protection Agency (EPA) Climate Pollution Reduction Grants (CPRG) program DEQ and VA Energy will launch and execute three distinct, but related measures (i.e., programs) that directly support the implementation of Virginia's Priority Climate Action Plan (PCAP) Measure 8 and comprehensively reduce methane emissions from targeted sources across the Commonwealth. These programs include:

- VA Methane Program 1: Fugitive Coal Mine Methane Capture & Utilization
- VA Methane Program 2: Landfill Methane Capture & Utilization
- VA Methane Program 3: Food Rescue and Composting

Each of these programs is designed as a competitive grant program or competitive site selection process that will be run by VA Energy (Program 1) or DEQ (Programs 2 and 3) and will result in directly procured contractors or subawarded funds to program participants (collectively and interchangeably referred to as "subawardees" for simplicity throughout the application) for projects that provide substantial GHG and co-pollutant reduction benefits, particularly in low-income, disadvantaged communities (LIDACs).

DEQ and VA Energy elected to address methane emissions through these programs in this coalition application because methane is not only a highly potent GHG, capturing 28 times the amount of heat as carbon dioxide over a 100-year period and more than 80 times in a 20-year period, it is a primary contributor to ground-level ozone which has significant public health impacts. In 2021, methane emissions comprised 12.5% of total GHG emissions in the Commonwealth. Reducing methane emissions in Virginia will provide significant near-term climate benefits, aligns explicitly with the U.S. Methane Emissions Reduction Action Plan, and will result in Virginia doing its part to contribute to the goals of the Global Methane Pledge.¹

In 2021, energy was the largest source of methane emissions in the Commonwealth (at 38.1% total methane emissions).² Energy-related methane emissions from oil and gas systems will be addressed through federal regulations (e.g., the U.S. EPA Methane Emission Reduction Program), therefore for the energy sector Virginia Energy is electing to focus this application on coal mine methane (CMM). Two of the top methane emitters in Virginia are underground mines that contribute nearly 40% of all of Virginia's point-source methane emissions, and in 2021, Virginia accounted for more than 10% of the nation's total CMM production.³ Capturing methane from coal mines and landfills, which can be converted into renewable energy, will enable GHG reductions across multiple sectors, offer economic benefits (e.g., through renewable energy credits), provide job opportunities, ensure energy reliability and security, and provide reductions in co-pollutants. Many of the opportunities for CMM projects in Virginia are in or directly adjacent to LIDACs, as identified using the Climate & Economic Justice Screening Tool (CEJST).

Waste-related methane emissions were the second largest source of GHG emissions in Virginia in 2021 (at 18.5%).⁴ Accordingly, this application addresses both reducing methane at landfills for beneficial uses such as renewable energy (offering the same benefits as renewable energy generated from CMM) and diverting organic waste through food waste reduction. Reducing food waste and composting decreases

¹ White House Office of Domestic Climate Policy. U.S. Methane Emissions Reduction Action Plan. November 2021.

<https://www.whitehouse.gov/wp-content/uploads/2021/11/US-Methane-Emissions-Reduction-Action-Plan-1.pdf>

² U.S. EPA. 2023. Greenhouse Gas Inventory Data Explorer – State-level data (from 2021). <https://cfpub.epa.gov/ghgdata/inventoryexplorer/>

³ Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>). The data was reported to EPA by facilities as of 8/18/23.

⁴ U.S. EPA. 2023. Greenhouse Gas Inventory Data Explorer – State-level data (from 2021). <https://cfpub.epa.gov/ghgdata/inventoryexplorer/>

the amount of organic waste entering into landfills and ultimately releasing methane or other co-pollutants, reduces other GHG emissions across supply chains, increases food security, particularly for those that need it most (e.g., through edible food donation), and reduces solid waste management costs. As with coal mines, many landfills in Virginia are in or adjacent to LIDACs.

DEQ has partnered with VA Energy on this critical application. As the state authority on energy production and management and leading steward of the state's energy resources, VA Energy is a key partner to DEQ for the proposed VA Methane Program 1, addressing CMM. DEQ will take responsibility for the waste-related programs (VA Methane Programs 2 and 3) but work with VA Energy to track methane reduction and other outputs and outcomes from Priority Methane Reduction Projects in Virginia. More specifically, roles and responsibilities of DEQ and VA Energy will involve program design; project selection; procurement; staff training; oversight of project permitting, construction, installation, and testing; key stakeholder and community engagement; project progress monitoring, evaluation, and reporting; and making improvements/sharing lessons over time.

a. Description of GHG Reduction Measures

VA Methane Program 1: Fugitive Coal Mine Methane Capture & Utilization

VA Energy and DEQ will use CPRG funding to establish a program to combat methane emissions from abandoned and active coal mines in Southwest Virginia. CMM is a highly potent greenhouse gas that is venting into the atmosphere at high volumes from active mines through degasification for miner safety and from abandoned mines where it escapes over time from the mined-out areas. Along with the many active projects in Southwest Virginia that have already proven to provide ample benefits to the Commonwealth, other potential sites for projects to capture and use methane from coal mines exist, according to the U.S. EPA Coal Mine Methane Outreach Program (CMOP) (see Figure 1). Some of these projects, indicated in the purple and green dots in Virginia below, are in LIDACs as identified using the Climate and Economic Justice Screening Tool (e.g., the Buchanan Mine in Census block 54081000900).

Figure 1. Current coal mine projects and opportunities in Southwest Virginia (from EPA)⁵



With CPRG funds the Fugitive Coal Mine Methane Capture & Utilization Program will allow subawardee(s) to install a CMM capture system on existing or abandoned coal mines and beneficially use that methane as a source of renewable energy. Through this program, VA Energy and DEQ aim to reduce 1 million metric tons (MMT) CO₂e from coal mine methane outgassing per year using commercialized technologies (e.g. gob degasification, air ventilation systems). As a part of scaling the outcomes this program, funding will also be used to update statewide policy recommendations for reducing and beneficially using CMM.⁶

⁵ U.S. EPA. 2024. Map of US Coal Mine Methan Current Projects and Potential Opportunities.

⁶ VA Energy. November 2023. Virginia Department of Energy Evaluation of Policy Options to Encourage the Capture and Beneficial Use of Coal Mine Methane.

https://www.energy.virginia.gov/public/documents/Public%20Meetings/Virginia%20Energy_Coal_Mine_Methane_Report20121116.pdf

VA Energy and DEQ will work together to update state policy recommendations for CMM and design this competitive grant program and select projects that will provide substantial GHG and co-pollutant reduction benefits, particularly in LIDACs. Other roles and responsibilities of VA Energy for the Fugitive Coal Mine Methane Capture & Utilization program include: program management and project oversight; site selection (based on criteria designed with DEQ); contract procurement in line with the competitive procurement procedures of 2 CFR Part 200 and 2 CFR Part 1500; engineering planning and procurement of materials, supplies, and equipment; and oversight of the installation of CMM capture systems, processing, treatment, and utilization of methane. VA Energy will also work with DEQ to support regular grant reporting bi-annually to EPA. Specific program tasks and milestones, and roles within each of these are outlined in Table 1 below.

Table 1. Tasks and Milestones for the Fugitive Coal Mine Methane Capture & Utilization program

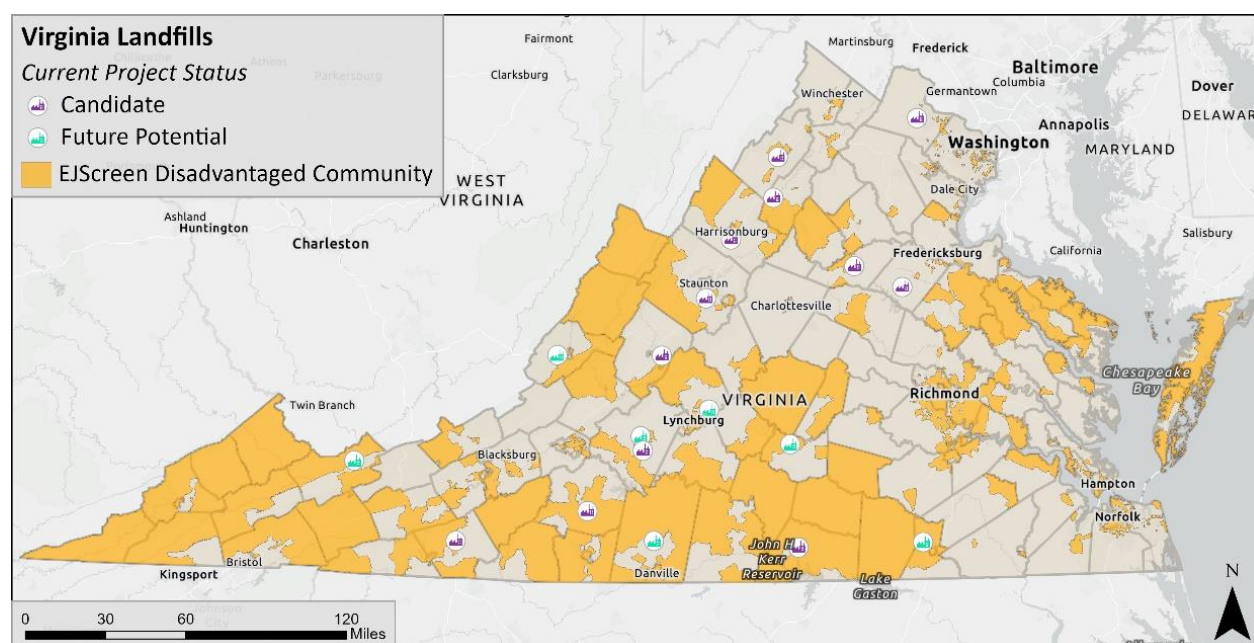
Task #	Description/Milestone	Anticipated Dates	Assumptions/Notes
1	Updated Policy Report and Recommendations	October 2024-September 2025	DEQ and VA Energy convene stakeholder groups to revise policy recommendations to support CMM.
2	Program Design	October 2024 – December 2024	DEQ and VA Energy develop site selection criteria and outreach to potential projects.
3	Project Requests and Selection	January 2025 – February 2025	VA Energy seeks information on projects from targeted coal mines and selects projects for funding.
4	Community Engagement	October 2024-September 2030	VA Energy provides information about the program and targeted project(s), convenes at public meeting(s) in selected project communities to discuss benefits, opportunities, and impacts.
5	Permitting	March 2025-September 2025	VA Energy supports projects in identifying and applying for all required permits.
6	Contractor & Subrecipient Procurement	March 2025-September 2025	Assumes MOUs are signed at the time of award. DEQ and VA Energy selection of contractor/subrecipient through competitive process to install CMM project(s).
7	Equipment & Supplies Procurement	March 2025-September 2025	VA Energy supports selection and purchase of all equipment and supplies for the proposed project(s).
8	Equipment Installation for Tests	October 2025- March 2026	VA Energy oversees contractor installation of equipment for CMM Tests in Southwest Virginia.
9	Monitor Tests	January 2026-September 2029	Subrecipient monitors test wells.
10	Assessment & Refinement	March 2026-December 2026	DEQ, VA Energy and contractor assess initial capture and reduction estimate refinement.
11	Initial Assessment Report	September 2026-December 2026	DEQ, VA Energy and contractor(s) develop Initial Assessment Report(s) that highlight key findings, strategies, and recommendation.
12	Additional Well Installations	January 2027-May 2030	VA Energy oversees contractor installation of additional wells and support/upgrades to achieve target of 1MMtCO ₂ e/yr.
13	Full installation of CMM Technologies	January 2027-May 2030	VA Energy oversees contractor installation of equipment for fuel cell technology.

14	Final Reporting, Project Closeout, and Ongoing Monitoring	June 2030- September 2030	DEQ, VA Energy and contractor develop Final report(s) to include assessment of technologies deployed and emission abatement, along with any policy changes during the project period. Close out the project and finalize all reporting requirements. Determine any ongoing monitoring requirements.
15	EPA Required Reporting	October 2024 – September 2030	DEQ and VA Energy develop bi-annual and final reports for EPA to support CPRG documentation.

VA Methane Program 2: Landfill Methane Capture & Utilization

DEQ will use CPRG funding to establish a state program aimed at reducing methane emissions from landfills in the Commonwealth through capture and/or beneficial use systems. EPA's Landfill Methane Outreach Program (LMOP) has identified 19 sites that are high potential candidates and future potential projects, many of which are in LIDACs as identified by CEJST (see Figure 2 below).⁷

Figure 2. LMOP Candidate and Future Potential Projects Relative to EPA EJScreen LIDACs



Through subaward(s) to collect and beneficially use methane from landfills, projects that come to fruition from this program will not only offer methane reductions at point sources, but also reduce co-pollutant emissions and help avoid GHG emissions by offering alternative renewable electricity and gas options for end uses. The landfill gas pre-treatment process will result in a reduction of particulate matter (PM 2.5), hydrogen sulfide (H₂S) emissions, and remove siloxane to reduce maintenance costs. Emissions reduction improves air quality, which reduces adverse health impacts, particularly for communities located near landfills (commonly LIDACs). The utilization of methane for producing heat, renewable gas, or generating electricity (on-site or off-site) used at adjacent or nearby facilities can help reduce energy costs. Similar projects exist in Virginia, such as Frederick County Regional Landfill, prime case study for EPA' LMOP and will be used as a model for best practices. DEQ has also been coordinating across the Commonwealth to identify opportunities for landfill (methane) gas reuse that

⁷ <https://www.epa.gov/lmop/lmop-landfill-and-project-database>

would benefit substantially from this program and that have existing, feasible and beneficial project ideas. For example, the landfill in Loudoun County, Virginia, which is identified as a candidate site for a project per EPA's LMOP and already captures methane but flares it, has been investigating opportunities to instead beneficially reuse the landfill gas to provide energy to an adjacent school (Sycolin Creek Elementary School) and/or adjacent Loudoun County Fire Department Building being constructed nearby. Given the high volume of data centers in this area, known as the data center capital of the world, other opportunities for beneficial use of landfill gas energy also exist and could help ensure unreliability for an energy system already grappling with how much new electric generation capacity is needed to support the region's economy.

Virginia DEQ aims at prioritizing landfill projects in LIDACs to benefit historical marginalized communities through improved air quality and receiving clean energy, as well as generate a new revenue source for facilities in these communities. Specific program tasks and milestones for DEQ, subrecipients, and any selected contractors (procured per federal competitive procurement requirements), and roles within each of these are outlined in Table 2 below.

Table 2. Tasks and Milestones for the Landfill Methane Capture & Utilization program

Task #	Description/Milestone	Anticipated Dates	Assumptions/Notes
1	Program Design	October 2024-December 2024	DEQ designs program, including project selection criteria.
2	Community Engagement	October 2024-September 2030	DEQ provides information about the program and targeted project(s), convenes at public meeting(s) in selected project communities to discuss benefits, opportunities, and impacts.
3	Information Collection	January 2025 – March 2025	DEQ releases and evaluates responses to an RFI calling for project ideas.
4	Request for Projects (Contractor and Subrecipient procurement)	March 2025 – May 2025	Based on RFI responses, DEQ invites respondents (landfill owners/operators and contractors) to submit formal requests for projects.
5	Subaward Selections	May 2025 – June 2025	DEQ reviews and awards projects.
6	Pre-Construction Planning	June 2025- September 2025	DEQ oversees project owners and contractors to conduct a feasibility study, conduct site assessment, and develop preliminary design for capture and/or use.
7	Permitting	September 2025-March 2026	DEQ supports project(s) in identifying and apply for all required permits.
8	Procurement of Equipment & Materials	September 2025-March 2026	DEQ supports selection and purchase of all equipment and supplies for project(s).
9	Construction and Installation	April 2026 -April 2028	DEQ oversees subrecipient/contractor site preparation, construction of the methane capture system on designated landfill(s) and installation of selected technologies.
10	System(s) Test	May 2028- December 2028	DEQ oversees subrecipient/contractor project tests.
11	System(s) Operation	January 2029-February 2029	Subrecipient(s) deploy full operation of the methane capture and/or use systems.
12	Project Closeout and Ongoing Monitoring	March 2029-September 2030	DEQ oversees subrecipient project monitoring and supports development of long-term monitoring plans. Close out the project and finalize all reporting requirements.

13	EPA Required Reporting	October 2024 – September 2030	DEQ develops bi-annual and final reports for EPA to support CPRG documentation.
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VA Methane Program 3: Food Rescue and Composting

DEQ will use this funding to establish a program to combat food waste across the Commonwealth by investing in edible food recovery and composting programs at college and university campuses to offset the amount of food waste going into landfills. Executive Order 17, *Recognizing the Value of Recycling and Waste Reduction* (EO 17), signed by Governor Glenn Youngkin on April 7, 2022, notes that “food waste is the single largest substance by volume sent to solid waste sites across Virginia and the United States.”⁸ Approximately 22% by weight of municipal solid waste (MSW) being sent to landfills is food.⁹ Approximately 58% of methane emissions from municipal solid waste landfills comes from waste food.¹⁰ In addition, wasted food contributes to greenhouse gas emissions prior to disposal, including during production, transportation, processing and distribution. The proposed program will rescue food that would have otherwise been landfilled to feed hungry people and divert wasted food to composting, limiting food from reaching landfills.

CPRG funding will support the establishment of a Food Rescue and Composting Grant Program, administered by DEQ in partnership with other relevant state agencies, which provides grants to reduce landfilled food waste through edible food rescue and increased food waste composting. DEQ would administer the grant funding through a competitive award process to Commonwealth agencies, colleges and universities in the Commonwealth. By implementing this project, DEQ can raise greater awareness about the impact of reducing methane emissions from landfills while also rescuing or diverting food waste. Each grant would have two distinct funded program requirements:

- 1) Edible Food Project – a project to rescue and donate edible food within a community to reduce food waste and increase access to food.
- 2) Food Waste Composting Project – a project to develop or expand an existing collection system for organics recycling.

This award would provide funding for (as needed):

- Administrative support needed to design, implement, and manage food rescue program and composting program
- Food waste compost receptacles and signage
- Infrastructure and equipment needed for food rescue
- Infrastructure and equipment needed for composting
- Ongoing support and program implementation including community engagement as possible.

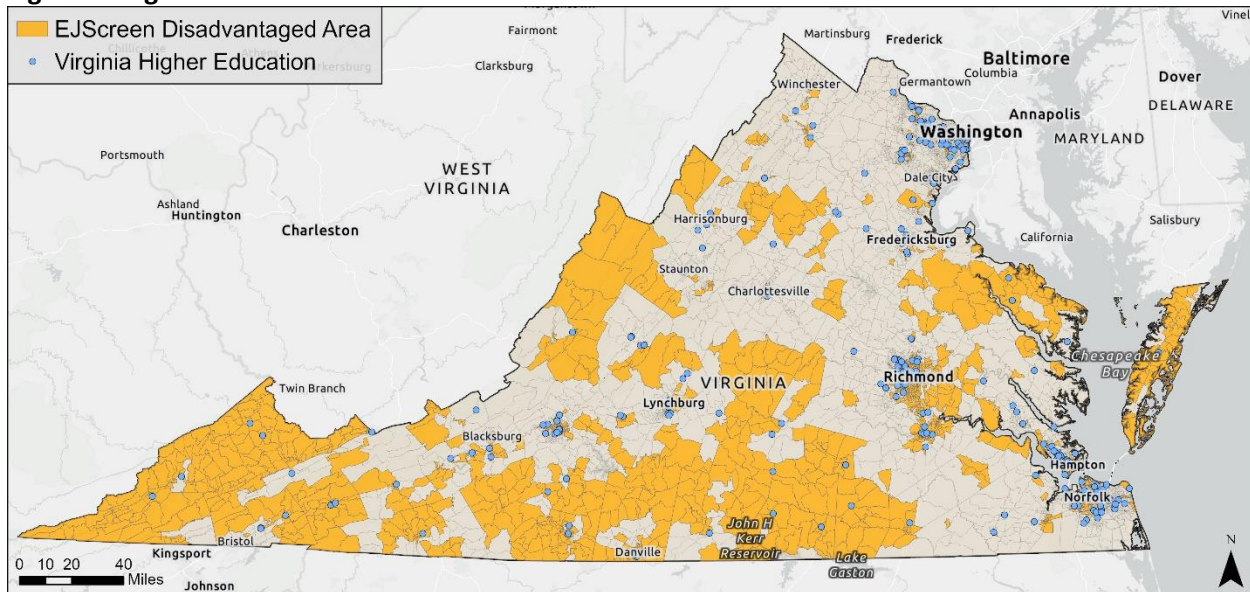
DEQ chose to focus on Commonwealth agencies and colleges and universities since they are large producers of food, have expressed high interest in working with DEQ to reduce GHG emissions, and many have partnered with DEQ in the past. DEQ is also focusing this program on locations within or adjacent to LIDACs (see Figure 3 for higher education institutions locations in LIDACs) and therefore can increase food security to low-income residents in Virginia.

⁸ Governor Glenn Youngkin website: <https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/eo/EO-17-Recognizing-The-Value-of-Recycling-and-Waste-Reduction.pdf>

⁹ <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>

¹⁰ <https://www.epa.gov/land-research/quantifying-methane-emissions-landfilled-food-waste#:~:text=Due%20to%20its%20quick%20decay,are%20from%20landfilled%20food%20waste.>

Figure 3. Higher Education Institutions Locations Relative to EPA EJScreen LIDACs



Colleges and universities also have a clearly defined and understood need, and examples models that already exist that can be used to help scale the impacts of this program. Examples of existing efforts of food donation programs at Virginia colleges and universities identified in the EO 17 report include: James Madison University (JMU) donates baked goods from its Panera Break outlet to local non-profits and the on-campus food pantry and donates all perishable foods to local food banks before school breaks; students at Christopher Newport University and the University of Mary Washington coordinate food donations to community partners; and the Virginia Tech program “Campus Kitchen” diverts unserved food from dining centers to local food access organizations; since 2015 the program has diverted over 275,000 pounds of excess food. Examples of ongoing food waste composting operations at Virginia colleges and universities identified in the EO 17 report include: Longwood University composts its food on-site; the finished compost is used with organic landscape material to produce compost used on campus for landscaping or lawn topdressing; JMU composts all back-of-house food waste and post-consumer food waste from its dining halls; Virginia Tech composts food waste through a private offsite vendor; and the University of Virginia’s UVA Dine program has partnered with the university’s Office for Sustainability to introduce composting to some athletic concession spaces and into the back-of-house at the Starbucks café in Newcomb Hall.

Eligible entities would include Commonwealth agencies, public and private two and four-year colleges and universities across the Commonwealth, with an additional evaluation weight for projects in LIDACs. This grant program would support statewide education and engagement on the importance of food waste reduction, thereby decreasing wasted food; provide opportunities for increased edible food rescue and food donation in food insecure communities; reduce emissions associated with landfilled organic waste by diverting from the landfill. DEQ anticipates providing grants to 15-20 Commonwealth agencies, colleges and universities. It is anticipated that funding for the first year will range between \$442,387 - \$589,850 per awarded project. The lower range is aimed towards Commonwealth agencies, colleges and universities with access to off-site composting facilities and the higher range supporting the development of on-site composting systems. Funding will help establish the food rescue and composting programs and the investment in infrastructure ensures that the positive effects of the food rescue program persist even after the initial funding has been utilized. By building a robust foundation, these

programs can serve communities effectively and sustainably. Specific program tasks and milestones for DEQ and recipients, and roles within each of these are outlined in Table 3 below.

Table 3. Tasks and Milestones for the Food Rescue and Composting program

Task #	Task Description/Milestone	Anticipated Dates	Assumptions/Notes
1	Research and Program Design	October 2024 - September 2025	DEQ to conduct a comprehensive study on the current state of food waste in the region. Identify key areas of waste and potential strategies for reduction and design a program based on findings, including aligning subaward selection criteria with CPRG goals.
2	Design Outreach and Engagement Resources	October 2024 - September 2025	DEQ to develop informational resources aimed at clarifying concerns around food donation such as staff training, the lack of existing relationships between donor organizations and feeding organizations, transportation costs, temperature and holding time requirements, among others.
3	Launch Program, Call for Projects, & Select Subawardee(s)	October 2025 - May 2026	DEQ to launch the program, release a call for projects, review all projects, and make subaward selections.
4	Subawardee Project Implementation	June 2026 -June 2028	Subawardee(s) begin to implement the selected project with oversight from DEQ.
5	Monitor Subawardee(s') Projects	July 2028 – May 2029	DEQ to monitor the success subawardee(s') projects had on GHG reductions. DEQ to hold quarterly virtual meetings with subgrantees to discuss challenges, successes and best practices
6	Evaluation & Future Planning	June 2029- May 2030	DEQ and subawardee(s) to conduct an evaluation of the program, GHG reductions strategies, and identify areas for continued investment to support GHG reductions and opportunities for expansion in Virginia and to other sectors.
7	Closeout	June 2030- September 2030	DEQ to close out the program and finalize all reporting requirements.
8	EPA Required Reporting	October 2024 – September 2030	DEQ develops bi-annual and final reports for EPA to support CPRG documentation.

Potential Risks and Mitigation Strategies: This information highlights the risks that could cause delays or interruptions in the development or implementation of the three programs aimed at reducing methane emissions in Virginia. It also discusses how these risks could impact the effectiveness of the measure and the extent of GHG emissions reductions for each program. Furthermore, it outlines certain mitigation strategies that can be implemented to reduce these risks.

Supply Chain and Technical Risk: Procurement of construction materials could be delayed due to supply chain issues. VA Energy and DEQ aim at having good relationships with suppliers to ensure they

understand the needs and priorities as well develop contingency plans for various challenges to ensure decisions can be made quickly and effectively when disruptions occur.

Regulatory or Permitting Risk: Misunderstandings of local, state, and federal regulations or changes in these regulations can result in non-compliance and project delays. To mitigate this, VA Energy and DEQ is committed to regularly monitoring regulatory changes and maintaining open lines of communication with policymakers and agencies at all levels. This proactive approach helps us anticipate potential policy changes. Additionally, the process of obtaining necessary permits for project implementation can be lengthy and may cause delays in the project timeline, subsequently affecting GHG reduction efforts. To minimize this risk, VA Energy and DEQ strive to identify and apply for all necessary permits as early as possible at the project's outset. This comprehensive and proactive approach ensures smooth project execution and timely GHG reduction.

Environmental & Safety Risk: Working with methane poses significant risks, particularly for those directly involved in on-site projects at coal mines or landfills. As a highly flammable gas, methane's capture and storage present safety and environmental hazards. If a safety or environmental incident were to occur, it would delay both the project timeline and the reduction of GHGs. Therefore, DEQ and VA Energy are committed to adhering to all safety requirements at the federal, state, and local levels. DEQ and VA Energy implement stringent safety protocols and provide comprehensive safety training to all staff members. Additionally, DEQ and VA Energy will regularly inspect and maintain equipment to prevent leaks, further ensuring the safety of our operations.

Community Acceptance Risk: Community acceptance is crucial for the successful implementation of new projects and programs. Opposition from local communities can pose significant risks, potentially leading to delays in project execution and greenhouse gas reduction efforts. This resistance often stems from concerns about health and safety, particularly in the case of methane capture programs. Additionally, the introduction of food waste programs can face hurdles due to a lack of awareness, perceived inconvenience, difficulty in changing habits, economic or cultural barriers, and insufficient infrastructure for donations. If communities rally against these initiatives, it could influence local elected officials and further impede progress. To mitigate these risks, organizations like VA Energy and Virginia DEQ are committed to early and frequent community education. By informing the public about the benefits of these projects, including potential monetary savings and improvements in health and safety, they aim to reduce reluctance and secure community buy-in. This proactive approach can significantly enhance the likelihood of project success.

Partner Capacity: The influx of funding from the IJA and IRA legislation to state and local agencies may strain their capacity to execute tasks or establish standalone programs. To alleviate this, DEQ is committed to frequent communication with partners and providing technical assistance as needed, aiming to support and ease any potential burdens.

Operational Risks: Project timeline delays present an operational risk for all proposed projects. To address this, DEQ and VA Energy are committed to identifying potential risks and devising mitigation strategies to prevent any hindrance to the operation of these projects.

Coalition Participation: DEQ will partner with VA Energy to form a coalition to implement the VA Project 1 Coal Mine Methane Capture Program in Southwest Virginia. VA Energy's and DEQ's roles and responsibilities for this program and Programs 2 and 3 in Tables 1-3 above.

PCAP Priority Reduction Measure: Each of these the three programs outlined in this application relate to Virginia's PCAP Measure 8: "Identify and implement strategies to reduce high-potency GHG emissions from industrial processes, energy production, agriculture, waste, and wastewater treatment." This measure was selected as a priority to support efforts to reduce GHG emissions by capturing or preventing methane emissions across industries in Virginia, resulting in cleaner air for the Commonwealth as well bolstering efforts to invest in alternative power generation sources. The

proposed projects and PCAP measure actively support the following CPRG goals (2) Pursue measures that will achieve substantial community benefits (such as reduction of criteria air pollutants (CAPs) and hazardous air pollutants (HAPs)), particularly in low-income and disadvantaged communities; (4) Pursue innovative policies and programs that are replicable and can be “scaled up” across multiple jurisdictions.

b. Demonstration of Funding Need

Program 1: VA Energy is seeking funding to support the collection and transformation of methane from active mines. This has been identified as a priority for the Commonwealth as the benefits of CMM capture and recovery include reduced GHG emissions, a cleaner-burning energy source or feedstock, enhanced mine safety, and additional revenue for mine operators.¹¹ It will help the Commonwealth realize substantial emissions reductions while incentivizing innovation and spurring investment in the methane reduction section. As a traditional coal mining region, Southwest Virginia will primarily see the benefits. The implementation of this project will enable the mitigation of economic difficulties associated with the closure of any coal facilities and help to transfer workers to other well-paid alternatives.

Program 2: DEQ is actively seeking funding to support a new program focused on landfill methane capture utilization. Historically, all landfill methane capture systems were developed without financial support from DEQ. However, given the agency’s commitment to reducing GHG emissions, the requested funds will facilitate the installation of new systems or expansion of existing ones throughout the state. Without CPRG funding, DEQ would be unable to financially support such investments, resulting in a diminished impact on GHG reduction for the Commonwealth. By implementing this project, methane collection from landfills can transform a highly dangerous pollutant into a valuable commodity, helping to offset energy costs for public facilities. Renewable energy credits and tax credits may be used to offset project costs or result in additional sources of revenue, but these are not substantial or certain enough to offset the initial upfront capital costs required, particularly for smaller to medium projects.

Program 3: In April 2023, DEQ and the Virginia Department of Agriculture and Consumer Services (VDACS) finalized a report on food waste reduction strategies per the requirements of Executive Order (EO) 17 “Recognizing the Value of Recycling and Waste Reduction.” The report outlines food waste reduction strategies for large-scale food providers.¹² The activities outlined in this proposal focus on two of the five recommendations in the report: donate extra food and compost food waste. DEQ proposes to focus its efforts on Commonwealth agencies and colleges and universities. EO 17 demonstrated a need for food waste reduction and programs that divert food waste from landfills and interest from large-scale suppliers of food, especially from Commonwealth agencies, colleges and universities based on their willingness to engage with DEQ while developing the EO 17 report. Unfortunately, no funding was attached to the executive order. Currently, DEQ does not have a program that provides financial support for mitigating food waste destined for landfills, which ultimately contributes to GHG emissions. DEQ notes that there are other funding sources for food waste and composting programs as outlined on EPA’s website “Funding Opportunities and EPA Programs Related to the Food System.”¹³ But one of the primary and the financially largest opportunity identified is the CPRG program and by seeking this funding DEQ is looking for scale in its results to address food waste in the Commonwealth.

c. Transformative Impact

Program 1: Activities under this project can provide proof-of-concept for innovative methods that place coal mine methane into productive uses, reducing emissions while adding value to the economy through energy production or another end product or service. Methane emissions from active and abandoned

¹¹ <https://lis.virginia.gov/cgi-bin/legp604.exe?231+ful+CHAP0496>

¹² <https://www.deq.virginia.gov/our-programs/pollution-prevention/executive-order-17>

¹³ <https://www.epa.gov/sustainable-management-food/funding-opportunities-and-epa-programs-related-food-system>

mines are a major contributor to overall GHG emissions and early investment in capture-and-use technologies can incite further development as it helps to realize cost-reductions for nascent technologies and sends positive market signals both to potential operators and entities seeking to invest in GHG reduction that the technology is viable and impactful. This methane capture program and the projects from it could serve as a truly transformative example of a CMM capture and use that could be replicated across the Commonwealth and the country, particularly with the reductions of GHG emissions and co-pollutants benefitting communities that have been historically negatively affected by the presence of coal mines.

Program 2: The proposed implementation of a landfill methane capture system program has the potential to accelerate the reduction of highly potent methane emissions. This initiative will serve as a replicable and scalable model for municipalities and county governments, offering them a practical and effective way to deploy existing GHG emission reduction technologies. By focusing on methane capture from landfills, the program targets already identified opportunities to reduce GHG emissions, thus filling resulting in short-term reductions for a GHG that has high global warming impact in a projected 20-year period. This project may lead to market transformation by accelerating the deployment of technologies or additional investment in methane capture and beneficial use systems across the Commonwealth. Once installed or expanded upon, the methane capture system will empower the municipality or county with the ability to transform current waste management practices, further contributing to GHG emission reductions and fostering a sustainable future. Projects funded under this program may also provide an opportunity to leverage district energy systems for space heating, providing further benefits by reducing energy-related emissions through these systems at prioritized locations such as public schools and other facilities.

Programs 1 and 2: Through providing alternative sources of energy for natural gas addition/substitution, electricity generation, manufacturing feedstocks, and transportation, these programs are contributing to transforming the energy supply sector in the Commonwealth and in the U.S., while supporting long-term system reliability. CMM and landfill methane can be mixed with pipeline natural gas, to provide the same services, such as building heating, industrial gas creation and as a manufacturing feedstock. This can also increase the longevity and cost-effectiveness of existing gas infrastructure while simultaneously reducing GHG impact. For electricity generation, methane gas fueled facilities are dispatchable resources that can supply electricity when called upon thus improving system reliability. The regional transmission operator, PJM, and the largest electric utility Dominion have both expressed concerns about long-term reliability of the electrical grid due to high load growth and an imbalance between the retirement of dispatchable resources and the addition of new variable units. Per Dominion's 2023 IRP, it forecasts a need for additional dispatchable resources including 4GW of new natural gas facilities and it has recently begun the process to permit a 1GW oil and gas peaking facility in Chesterfield County. CMM, for example, may offer an environmentally beneficial alternative for a portion of this capacity while addressing the reliability concerns identified by PJM and Dominion.

Program 3: The proposed program aims to inspire initiatives across the Commonwealth to reduce food waste, establishing replicable and scalable policies and designs that can be picked up by other institutions and through the Commonwealth and country. This innovative approach, which offsets food waste sent to landfills, could contribute to greenhouse gas emission reductions and potentially drive market transformation. Commonwealth agencies, colleges and universities, as community hubs, will support the local community through food rescue programs and compost collection. Many of these institutions are developing rescue and composting programs on limited budgets. The provision of funding will help establish efficient programs that can continue beyond the grant term, aligning with many institutions' commitments to reduce greenhouse gas emissions. It is anticipated that these institutions will see a decrease in waste management costs due to the diversion of edible food and

composting of food waste. As part of the grant program, applicants will be required to outline steps for institutionalizing the funded programs, with DEQ scheduling mid-point check-ins to discuss long-term implementation.

2. IMPACT OF GHG REDUCTION MEASURES

a. Magnitude of GHG Reductions from 2025 through 2030

Cumulative GHG emission reductions from each program for this application overall for 2025 through 2030 are summarized in Table 4 below. These assume there are no additional funding sources used for these programs. For additional information on the calculation details see attachments

Techappx_VADEQ.pdf and GHGcalcs_VADEQ. GHG emission reductions were calculated assuming a global warming potential of 28 for methane in line with AR5.

Table 4. Cumulative GHG Reductions (metric tons CO₂e) from 2025 to 2030 for Priority Methane Reduction Projects in Virginia

Program	Cumulative GHG reductions, 2025-2030
VA Methane Program 1: Fugitive Coal Mine Methane Capture & Utilization Program	3,239,669.42
VA Methane Program 2: Landfill Methane Capture & Utilization Program	128,607.29
VA Methane Program 3: Food Rescue and Composting	30,656.62
Priority Methane Reduction Projects in Virginia	3,398,933.34

The installation of long-lifetime equipment to capture and beneficially use methane from coal mines and landfills, and required testing, monitoring and evaluation of projects as outlined in Tables 1 and 2 above will ensure the durability of GHG reductions from Programs 1 and 2. With the potential for projects resulting from these programs to generate revenue streams from renewable energy credits or other opportunities, project and site owners and operators are incentivized to maximize methane capture, also ensuring the durability of GHG reductions. For food waste and composting programs, and resulting GHG reductions, the durability of GHG reductions is more uncertain. However, this can be bolstered with program evaluation (see Table 3). Additionally increased education and program visibility, consumer demand as a result of establishing a “new normal” for everyday practices and sources of food for those who need it most can result in increased program use and demand over time – with CPRG funds spurring initial programs it is likely that colleges and universities will continue to fund food waste and composting initiatives due to student, facility, and community preferences.

b. Magnitude of GHG Reductions from 2025 through 2050

Cumulative GHG emission reductions from each program for this application overall for 2025 through 2050 are summarized in Table 5 below. These assume there are no additional funding sources used for these projects. For additional information on the calculation details see attachments *Techappx_VADEQ.pdf and GHGcalcs_VADEQ.xlsx*. GHG emission reductions were calculated assuming a global warming potential of 28 for methane in line with AR5.

Table 5. Cumulative GHG Reductions (metric tons CO₂e) from 2025 to 2050 for Priority Methane Reduction Projects in Virginia

Program	Cumulative GHG reductions, 2025-2050
VA Methane Program 1: Fugitive Coal Mine Methane Capture & Utilization Program	23,239,669.42
VA Methane Program 2: Landfill Methane Capture & Utilization Program	1,414,680.19
VA Methane Program 3: Food Rescue and Composting	166,908.29
Priority Methane Reduction Projects in Virginia	24,821,257.90

c. Cost Effectiveness of GHG Reductions

The cost effectiveness (calculated as requested CPRG implementation grant dollars divided by the quantified GHG emission reductions for the period 2025-2030 calculated the CPRG funding request) for each program this application overall is presented in Table 6.

Table 6. CPRG Cost-Effectiveness of Priority Methane Reduction Projects in Virginia

Program	CPRG Cost per Metric Ton of CO ₂ e Reduced
VA Methane Program 1: Fugitive Coal Mine Methane Capture & Utilization Program	\$25
VA Methane Program 2: Landfill Methane Capture & Utilization Program	\$75
VA Methane Program 3: Food Rescue and Composting	\$313
Priority Methane Reduction Projects in Virginia	\$29

Factors that may affect the cost effectiveness of each program as shown above include variations in the cost of equipment and timing of project selection and installation (e.g., because of risks - see Section 1 above). DEQ also notes that the costs reflected reflect capital costs and program costs, and do not reflect any potential savings or new revenue streams. Project developers and owners, such as municipalities that own landfills, may benefit from new revenue streams because of renewable energy credits that can help offset other community costs or be reinvested to provide community benefits. Further downstream, consumers may be able to offset or reduce energy costs through directly supplied onsite renewable energy or proximity energy sources or reduce transportation costs due to sourcing food from more localized sources.

d. Documentation of GHG Reduction Assumptions

For additional information on the calculation details see attachments *Techappx_VADEQ.pdf* and *GHGcalcs_VADEQ.xlsx*.

3. ENVIRONMENTAL RESULTS – OUTPUTS, OUTCOMES, AND PERFORMANCE MEASURES

a. Expected Outputs and Outcomes

Program 1: This program would not incentivize new coal mining but would work with an existing active network of coal mines or abandoned mine properties that either do not have capture technologies or would be upgrading technology for improved capture. In the short-term (0-1 years), expected outputs and outcomes in Year 1 are the development of various innovative policy and usage options and the formation of an Advisory Committee to create recommendations. Outreach to communities would take place including a public meeting to discuss benefits and impacts of CMM capture implementation. Another output would be the selection of a contractor/subrecipient through a competitive process to install CMM on existing underground mine(s) in SWVA. The identification of exact locations will be based on property agreements and MOUs. Some medium-term (1-2 years) expected outputs and outcomes are the procurement and installation of equipment for CMM in SWVA with test location(s) rated capable of 500 MCFD from historical data, assessment of initial capture and reduction estimate refinement through DEQ in conjunction with VA Energy and a third-party contractor, a full LCA of processes selected for implementation including fuel cell technology, and an initial assessment report that will likely take two years. Lastly, the long-term (2-5 years) expected outputs and outcomes are the installation of additional wells and upgrades to achieve a target of 1MMtCO₂e per year which would require about 25 wells at 500 MCFD removal at 50% methane to reach the target, and installation of equipment for fuel cell technology with 70% or more efficiency.

The GHG emission reductions as outcomes would consist of methane reductions as outlined in Tables 4 and 5 above, a >99% decrease of NO_x over venting release, a 99% decrease of CO over venting release, a 98% decrease of VOCs, and an 80% decrease of CO₂ over natural gas flaring.

Program 2: This program aims at reducing GHG emissions (see Tables 4 and 5 above) and improving the air quality. This will result in reduced healthcare costs and improve quality of life for those in communities surrounding the landfills. Reductions in GHG emissions are correlated with a drop in emergency room visits related to respiratory diseases and conditions, such as asthma or lung disease. Air quality improvements provide societal benefits including reduced respiratory distress, sick days from work and school, as well as healthcare costs. Landfill gas capture and use systems can also improve safety in surrounding communities through reducing explosion hazards. These projects will create quality, high paying construction and maintenance jobs along with other economic effects. LMOP estimates that a typical 3 MW project, not that much larger than the 2 MW project installed at the example Frederick County landfill facility, may result in 9.6 additional jobs.¹⁴ Other economic benefits may include reduced environmental compliance costs, increased opportunities for new revenue streams, and offsetting energy costs municipalities or counties may have by providing direct energy resources. DEQ expects to invest in landfills that will directly impact LIDAC communities in the Commonwealth.

Program 3: Reducing organic landfill waste through food waste diversion and composting will have direct results of reduced landfill GHG and co-pollutant emissions and also reduced GHG and co-pollutant emissions across the supply chain (e.g., through reduced need for transportation). Additional expected outcomes from this program include increased food availability and nourishment for those that may need it most, increased consumer awareness, and reduced costs for Commonwealth agencies, colleges and universities through reduced need for disposal and hauling. Increased composted materials also provide the additional benefit of recycling nutrients back to soils.

DEQ will hire one new staff person for both Program 2 and Program 3 (two new FTEs total).

b. Performance Measures and Plan

Together VA Energy and DEQ will identify and track all necessary information about progress and implementation of each program included in this CPRG application and for Priority Methane Reduction Projects in Virginia overall. DEQ will work with VA Energy to track progress for projects included in this proposal to determine a regular reporting and timekeeping schedule that adheres to EPA CPRG Implementation requirements. With input from Virginia Energy, DEQ will provide all necessary details in respect to each performance measure to EPA in the semi-annual reports and final report.

Metrics that DEQ and Virginia Energy may use track progress for the programs in this application include:

- Community Events, including the number of community events that take place throughout the implementation of the projects and the number and diversity of participants.
- Number of projects and program participants by program
- Reduction in methane emissions/methane capture and use rates (metric tons of CO₂e), overall and in LIDACs
- Reduction in co-pollutants (grams, kgs, or metric tons), overall and in LIDACs
- Amount of energy generated from captured methane (in MW and/or mmbtu)
- Quantity of composted materials and the makeup of those materials (pounds)
- Quantity of food waste repurposed/redirected for donation for low-income communities (pounds)

DEQ and VA Energy will provide metric tracking templates and instructions (e.g., emission rates to use) and require regular reporting from subawardees as a part of program participation and as a contingent requirement for receiving program funds. The subgrantees within each program will be responsible for

¹⁴ <https://www.epa.gov/lmop/benefits-landfill-gas-energy-projects>

tracking and collecting project data to support the above metrics and providing it to DEQ and VA Energy, as applicable. VA Energy and DEQ will compile this information and track it through a dashboard that will be updated once a quarter. This dashboard will also be used to support regular reporting to EPA.

c. Authorities, Implementation Timeline, and Milestones

DEQ, established in the Code of Virginia under § 10.1-11831, will serve as the lead agency with the authority to administer and disburse funds as subawards to project partners for the implementation of Programs 1-4. DEQ will also oversee all project reporting from VA Energy, which as a state agency, has the authority to procure and/or implement all tasks under their respective projects. Summaries of key timelines and milestones are included below, but more detail on these and roles and responsibilities can be found in Section 1.a.

Program 1: The activities that will take place within one year are policy options and recommendations group formed and selection of the contractor and/or subrecipient through competitive process to install CMM on existing underground mine(s) in SWVA. Virginia DEQ and VA Energy will develop site selection criteria and conduct outreach to potential projects by convening stakeholder groups to revise policy recommendations. VA Energy will provide ongoing community engagement throughout the project by convening public meetings to provide information about the program and selected project(s) and will bolster public support of CMM and increase awareness. The goal should help to increase support and funding for CMM in Virginia. In the medium-term (one to two years) procurement and installation of equipment for CMM in SWVA, assessment of initial capture and reduction estimate refinement, and application for necessary permits and instating MOUs for contractors and subrecipients. The installation of CMM technologies on one or more test sites in SWVA will have a milestone of 18 months and the subrecipient will install and operate test well for monitoring purposes and will be monitored for comparing estimates to actual emissions. At two years, the activity that will take place is an initial assessment report to refine reduction estimates. In the long-term, which is anticipated to take about two to five years, the activities that will take place are the installation of additional wells and support and upgrades to achieve target of 1MM tCO₂e per year and installation of equipment for fuel cell technology. The full installation of CMM technologies on multiple wells and full installation of equipment for CMM technologies will have a milestone of 30 months and the subrecipient will install and operate multiple wells, and the multiple wells and CMM technologies will reach target of 1MM tCO₂e per year. VA Energy and DEQ will work with subawardee(s) to meet all reporting requirements by the EPA to finalize and closeout the CPRG grant. Please review the Project Timeline and Milestone section above for project specific details.

Program 2: Virginia DEQ will function as the lead agency to design the new funding opportunity aimed at investing in landfill methane capture systems. During year one, Virginia DEQ will design the program and project selection criteria, convene public meetings to discuss the program and targeted project(s), and release an RFI allowing entities to submit questions about the program as well as proposed projects for municipal and county landfill sites as well as engage with key stakeholders to receive feedback on the program design. Virginia DEQ will invite project submissions through a request for projects (RFP) and select subawardee(s) once all RFPs are reviewed for compliance and completeness. Once funds are obligated, subawardee(s) will be responsible for conducting a feasibility study, finalizing the methane capture system engineering plans and pulling all necessary permit as well as procuring construction services, equipment, and technologies that will be needed to install the actual system. Once those steps are completed, construction and installation of the methane capture system will begin in April 2026-April 2028 followed by extensive system testing, monitoring, and adjustments in May 2028-December 2028. Virginia DEQ expects all municipal and county landfill methane capture systems will be operational between January-February of 2029. Virginia DEQ will work with subawardee(s) to meet all

reporting requirements by the EPA to finalize and closeout the CPRG grant. Please review the Project Timeline and Milestone section above for project specific details.

Program 3: Virginia DEQ will function as the lead agency in developing the grant program to support eligible entities to establish or expand upon existing food waste reduction. Commonwealth agencies and colleges and universities have the authority to implement and manage these programs at their facilities, in coordination as needed with other vendors. Virginia DEQ will begin research, program development, design outreach and engagement resources all within the first year. At the end of year one, DEQ will launch the program. During year two, Virginia DEQ will implement the new program, issue an RFP, review RFP responses, and award funding to eligible entities based on program criterion. Subawardee(s) will begin implementing the food waste programs June 2026-2028, with the goal of diverting food waste from landfill to reduce GHG emissions by the end of year-two. GHG reduction tracking will begin in year two and will continue throughout the duration of the project, although it is anticipated that once the program ends these projects will continue since the infrastructure will already be in place. Based on the success of the project, subawardee(s) and Virginia DEQ will conduct an assessment to evaluate the project implementation, GHG reductions strategies, and identify areas for continued investment to support GHG reductions in years four through five. DEQ will work with subawardee(s) to meet all reporting requirements by the EPA to finalize and closeout the CPRG grant. Please review the Project Timeline and Milestone section above for project specific details.

4. LOW-INCOME AND DISADVANTAGED COMMUNITIES

a. Community Benefits

The programs included in this application will result in substantial and varied benefits for LIDACs throughout the Commonwealth and directly support § 2.2-235 of the Code of Virginia, “[i]t is the policy of the Commonwealth to promote environmental justice and ensure that it is carried out throughout the Commonwealth, with a focus on environmental justice communities and fenceline communities”. As a part of program design DEQ and VA Energy will create project selection criteria that prioritize benefits for LIDACs and minimize adverse impacts. All parties involved will maintain consistent communication with all communities (including LIDAC) impacted by the proposed projects and provide quarterly or bi-annually progress updates to the public to ensure all relevant information is shared in a timely manner. Many benefits of the methane programs and resulting projects from this application are discussed in the above sections. These are briefly summarized here. Please also refer to Sections 1, 2 and 3 and the file *Areas_VADEQ* for supporting data.

- **Air quality and health benefits.** Highly localized air quality improvements through CMM projects and landfill gas capture and beneficial use projects will be realized for the LIDAC communities in which these mines and landfills sit (see Figures 1 and 2). Reduced transportation to move landfill waste and close-by donations to food banks has the potential reduce GHG and co-pollutant emissions in highway adjacent and LIDAC communities and may reduce these emissions throughout the food supply chain. Lower emissions will also lead to reduced health risks and overall healthcare costs.
- **Improved reliability.** Through alternative energy resources from CMM and landfill methane, overall energy system reliability in Virginia will be realized. This improved reliability provides benefits for all Virginia residents and may provide additional benefits to low-income residents and small businesses through reduced outage time that can negatively impact business revenues and productivity.
- **Safety improvements.** An unexpected release of methane or seepage of methane from a mine through cracks in the strata can potentially pose a fire or health hazard. Therefore, as a result of methane programs included in this application overall safety of communities from reduced

exposure to flammable gases will also be realized in LIDACs with CMM and landfill capture and reuse projects.

- **Local job creation.** Construction jobs during the initial deployment of the technology and long-term operations and maintenance jobs for methane capture and reuse that provide wages that are on average higher than the local prevailing wage and meet the requirements of the Davis Bacon Act will become available. Jobs would likely be filled by former coal mine workers and other unemployed or underemployed members of the local community.
- **Workforce development opportunities.** Many of the positions would require skilled labor. While some of the workforce may already possess the required skills others would benefit from job training programs. Depending on project, company, and student demand, potentially outside investment from hiring companies and local educational institutions could be spurred.
- **Increased revenue and repurposing of public funds.** Through selling renewable (methane) gas, local governments that own landfills may benefit from new revenue streams because of renewable energy credits that can help offset other community costs or be reinvested to provide community benefits, targeting programs and services that benefit LIDACs.
- **Social and community benefits.** Composting and food waste reduction programs on campuses will support social and community benefits such as the implementation of community gardening and increased food donations that will benefit low-income residents.

Project 1: The benefits from Project 1 are mainly expected to be concentrated in the Coalfields region of southwest Virginia (see Figure 1) as this is the only location for active mines in the Commonwealth. It also contains the vast majority of abandoned mines in the state. Benefitting counties should include some or all of Buchanan, Russell, and Tazewell counties, all of which have relatively high poverty rates compared to the national average of 11.5 % in 2022 (see Table 7).¹⁵

Table 7. Benefitting Counties from Program 1

County	Median Income	Poverty Rate
Buchanan	\$39,951	25%
Russell	\$44,088	19%
Tazewell	\$46,508	18%

The coalfields region of Virginia has seen reduced economic activity in recent years due to the decline in coal demand. Many of the census tracts in the area qualify for economically distressed statuses per the CEJST and EJScreen tools, as well as historically economically disadvantaged community (HEDC) status created by the Virginia Clean Economy Act (VCEA). Additionally, the region has experienced environmental degradation as a result of historic coal extraction, including methane released from abandoned mines. Due to these factors, many of the areas where Coalmine Methane operations are or could be located would be considered environmental justice communities and Coalmine Methane operations could be viewed as having positive effects for these communities through reduced environmental harms and increased economic opportunity.

Program 2: Investing in existing or new landfill methane capture systems may yield positive impacts on the local communities and environment. Virginia DEQ anticipates a reduction in GHG emissions from landfills by capturing methane, which accounts for a significant source of methane gas released into the atmosphere. Capturing this highly potent GHG emission will provide the local population with improved air quality and reduce pollution due to capturing the methane emissions coming from landfills. Low-income and minority communities will receive the largest benefits from the proposed projects because of decades of systematic neglect resulting in the majority of landfills being built within these

¹⁵ <https://www.census.gov/library/publications/2023/demo/p60-280.html>

communities. Secondary benefits these communities may experience are improved health and safety benefits as a result of the reduction of air pollution from landfills. Children and the elderly, as well as residents living with conditions such as asthma, heart diseases, lung cancers, will significantly benefit from the impacts of methane reduction from landfills. Additional monetary benefits may be observed based on the specific type of utilization the subawardee(s) select for the proposed project. The local community may receive cost-savings as a result of repurposing the methane to heat or provide a generation source for electricity. For LIDAC communities these cost-saving benefits may allow them to invest in other GHG reduction projects or free up funds in the budget for other priorities.

Program 3: The benefits from Program 3, to reduce food waste and do composting, will include direct benefits to LIDACs. Approximately 40% of Virginia's higher education institutions are located in LIDACs. The priority focus of Program 3 to award grant projects to these institutions will help support the creation of community food donation and composting programs, enabling shared benefits to LIDAC residents nearby the institution. Virginia DEQ would ensure that the subawardees for this program have conducted stakeholder engagement and outreach for siting their on-site composting facility and that the construction of any associated infrastructure is managed accordingly.

While all the benefits described above will provide socioeconomic and environmental benefits, infrastructure projects, like any construction activity, can have negative impacts on the environment and quality of life for local communities. For the projects awarded funds through the methane programs, VA Energy and DEQ will require community engagement to incorporate and address local community concerns, such as community-informed site plans. Virginia DEQ would ensure that the subawardees for these programs have conducted substantial stakeholder engagement and that the construction of any associated infrastructure is managed appropriately. VA Energy and DEQ would continue to assess, quantify, and report benefits and avoid disbenefits as projects are implemented at the identified locations.

b. Community Engagement

To maximize benefits to communities and minimize potential negative impacts, the subawardees, in collaboration with VA Energy and DEQ, will be required to directly engage communities and co-create benefit opportunities and solutions. In particular of Programs 1 and 2, during community engagement stages, project developers will seek to identify specific benefits supported by the community to include in Community Benefit Agreements (CBAs) for specific localities. This may include items such as adopting local conservation practices, providing funding for road maintenance, increasing runoff prevention efforts, donations to town beautification efforts and other opportunities as identified by community stakeholders. For Program 3, subawardees will be responsible for developing plans and acting on those plans to engage with local communities. Different tactics for the programs are described below.

Programs 1 and 2

- Achieving consensus on community-informed site plans, CBAs. Subgrantees will document and mitigate concerns and recommendations identified during community stakeholder engagements which will support multiple languages to promote accessibility. Subgrantees will track engagement participation, including zip code and Census block/tract IDs, and affiliation to ensure our engagement is inclusive of all stakeholders (see Section 3).
- Identifying and reporting of total benefits provided to communities per project. This includes Justice40 reporting, as well as any tax, workforce, siting commodities, monetary and non-monetary benefits agreed to with subgrantees.
- Reporting on posted apprentice, certification, and employment opportunities. Apprenticeship and general employment opportunities will be posted publicly and filled prior to the beginning

of the construction process for each program. Subgrantees will track and report total candidate pull, number of local candidates, number of hires, number of local hires and average salaries.

Subgrantees will be expected to identify and execute engagement strategies that are most appropriate for the type and location of project they propose, and they will be expected to conduct initial social characterization assessment (SCA), using tools, such as the EPA's EJScreen and CEJST) to identify LIDACs around and near project sites. Subgrantees will use this information to determine appropriate engagement based on cultural, social, environmental, workforce, and educational factors. During initial planning phases developers may perform more comprehensive research and interviews to identify stakeholders, potential impacts, burdens, and opportunities.

Stakeholder engagement may include listening sessions, town halls, and open houses for community concerns, interests, needs, and engagement preference through consensus informed processes. Meetings will be held in-person and virtually to adapt to the lack of broadband access and excessive travel distances associated with rural communities. Collaborative public input processes will be designed and conducted for each project. Community outreach strategies will include newspapers, social media, flyers, and distributed mailers near project sites at least two weeks in advance of meetings and will be conducted by the county and the appropriate developer. Where applicable, materials and meetings will be made available in multiple languages.

Program 3: For the Food Waste Rescue and Composting Program, Virginia DEQ will engage with community-based organizations and stakeholders at college and university campuses across the Commonwealth to share the grant program opportunity and hear from stakeholders about opportunities for new or expanded edible food rescue and compost programs. Through grant programs Commonwealth agencies, colleges and universities will be encouraged to engage community partners, especially through providing rescued food and access to composting. Virginia DEQ's Office of Pollution Prevention will leverage the awarded grant programs by reaching out to other food distributors in areas where these programs are set to engage more organizations to build off the university programs (restaurants, grocery stores, convenience stores, local farms, farmers markets), especially through existing programs. During the initial program design and outreach stage, Virginia DEQ will lead and require subgrantees to engage in the following activities:

- Reaching out to and engaging with colleges and universities across the Commonwealth, particularly those located in LIDACs, to share information about the Food Waste Rescue and Composting Program opportunity and identify resources that would support continued engagement.
- Developing and conducting awareness and engagement campaigns focused on food generating campus facilities and identification of key stakeholders such as facilities managers, sustainability teams, and other program leaders that can support information sharing and program applications. These campaigns will be multilingual.
- Conducting outreach to community-based organizations and food banks, shelters, and other organizations to identify best practices and opportunities to leverage or maximize through grant program design.

5. JOB QUALITY

In this proposal, Virginia DEQ and VA Energy have identified a range of work that can be implemented to launch programs funding projects by subawardee(s). These projects aim to produce high-quality work, prevent disruptive and costly delays, and promote efficiency. Virginia DEQ, VA Energy, and the subawardee(s) will adhere to strong labor standards, including wages at or above the prevailing rate, and will incorporate local hiring provisions, and adhere to Davis-Bacon requirements. GHG reduction

projects have positive impacts on job quality in several ways. Firstly, by curbing emissions in the Commonwealth, air quality will improve, leading to reduced air-related illnesses and ultimately lowering medical costs and staff absences. GHG reduction activities will also create new employment opportunities and foster economic growth across the energy, waste management, and manufacturing sectors. The proposed projects aim to promote job creation and stability in Virginia's job market, while investments in transportation-related emission reduction can lead to a number of green jobs and sustainable opportunities.

Program 1: Virginia Energy anticipates workforce development being a key component of the awarded project(s), with workforce and job training programs tailored to the type and location of the project. Project partners will promote effective and efficient delivery of high-quality projects that support economic resilience with strong employment opportunities for workers. VA Energy and DEQ will work to carry out the identified projects in ways that produce high-quality work, avert disruptive and costly delays, and promote efficiency. There will be workforce development, training, and job opportunities in regions across the Commonwealth created through these projects. Specific quality job creation and support strategies may include:

- Partnerships to leverage recruiting and training resources focused on coal mining and fenceline communities.
- A robust training program that focuses on students currently within an educational program (grades 6-12, technical career centers, and community colleges); unemployed individuals, displaced workers from coal mine or fossil fuel plant closures; workers outside of the energy industry; and current workers within the energy industry.
- Retention and promotion processes that are inclusive of disadvantaged populations and underrepresented groups.
- Inclusion of local Disadvantaged Business Enterprises (DBEs) to promote job opportunities and economic development.

The anticipated coal mine methane capture projects will provide job opportunities and capital investment in Southwest Virginia (Buchanan, Dickenson, Tazewell, Russell, Wise, Lee, and Scott Counties) where the decline of the coal industry has seen the loss of a high number of well-paid jobs.¹⁶ With the decrease in active mining, many coalfield communities are struggling economically and environmentally, and are considered CEJST Justice40 disadvantaged communities and score within top percentiles on EPA's EJScreen indices.^{17,18}

Workforce development can be a community benefit through its creation of equitable career pathways and training opportunities. Specifically, this includes preparing individuals for high-quality, middle-skill career pathways that enable economic mobility, rather than short-term, low-wage jobs. This could involve using high-quality training models, such as: Pre-apprenticeship programs with connections to one or more Registered Apprenticeship Programs, Registered Apprenticeship Programs, Joint Labor-Management Training Programs, Paid internships; and/or, Partnerships with community colleges that award an industry-recognized credential.

Program 2: Virginia DEQ anticipates this program will support quality jobs across various jurisdictions in the Commonwealth, particularly for projects located in LIDAC communities, similar to the discussion above for Program 1. This type of investment can take place by focusing on workforce development initiatives or apprenticeships within LIDAC areas. Historically, LIDAC communities have borne a disproportionate impact from landfill emissions, resulting in adverse living and health conditions. The

¹⁶ <https://rga.lis.virginia.gov/Published/2023/RD634>

¹⁷ <https://screeningtool.geoplatform.gov/en/#7.33/36.531/-82.373>

¹⁸ <https://ejscreen.epa.gov/mapper/>

proposed program aims to reduce the burden LIDAC communities face and seeks to support quality training, workforce development, and quality jobs for members of those communities.

Program 3: The Food Rescue and Composting program is focused on university and college campuses and may provide training opportunities to students for composting and food rescue program management. This can occur in partnership with campus Sustainability Offices to support student internships or paid positions to manage the food rescue programs. It can also provide opportunities for green clubs at local grade schools to engage with their local university on sustainability initiatives with the goal of learning how to implement food waste reduction programs within their own schools.

6. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

a. Past Performance

The information below shows Virginia DEQ past performances for various grants. The information below demonstrates Virginia DEQ's past performances for a diversity of grants. Along with DEQ's experience, VA Energy also administers a number of federal grants and has robust processes for developing RFPs, selecting projects and monitoring projects for adherence to grant requirements.

Project Title: State Clean Water Revolving Fund Base Capitalization Grant

Assistance Agreement Number: EPA #CS-51000122-0

Federal or Non-Federal Funding Agency and Assistance Listing Number: 66.458

Description: A capitalization grant which provides funds for DEQ's Clean Water State Revolving Fund (CWSRF) program. The activities are to provide low interest financing to numerous subrecipients for costs associated with the planning, design, and construction of eligible water quality improvement and protection projects. DEQ has submitted all required financial, programmatic and project reporting for the CWSR. The program has a history of satisfactory Program Evaluation Reports (PER) summarizing EPA's oversight review of the CWSRF. PERs for the SFY 2021 and SFY 2021 resulted in zero corrective actions needed for Virginia's CWSRF.

Organization Contact: Catherine King

Project Title: Chesapeake Bay Program Implementation, Regulatory/Accountability and Monitoring Grants

Assistance Agreement Number: EPA #CB-96383501-3

Federal or Non-Federal Funding Agency and Assistance Listing Number: 66.964

Description: As Virginia's lead agency for nonpoint source pollution (NPS), DEQ has been working with DCR to use these funds to accomplish objectives of the Virginia Chesapeake Bay TMDL Phase III Watershed Implementation Plan, and Virginia's Milestones, with an emphasis on nonpoint source pollution reduction programs. DEQ has successfully managed CBIG grants since 2013. Progress reports for projects currently underway follow a semi-annual cycle and have been submitted and reviewed on schedule.

Organization Contact: Erin Chapman

Project Title: Climate Pollution Reduction Grant Program (CPRG) Planning Grant

Assistance Agreement Number: EPA #5D-95316001-0

Federal or Non-Federal Funding Agency and Assistance Listing Number: 66.046

Description: DEQ successfully received and managed funding under the CPRG Planning Grant to develop a comprehensive, economy-wide climate mitigation plan in collaboration with air pollution control districts, large and small municipalities statewide, and tribal governments that will support actions to reduce GHGs and harmful air pollutants and conduct meaningful engagement with low-income and disadvantaged communities. DEQ also assisted local governments in developing or updating their GHG inventories and action plans. DEQ developed and submitted a statewide Priority Climate Action Plan (PCAP) for Virginia on 3/1/24. In addition, the DEQ developed a Quality Assurance Project Plan (QAPP)

that was also approved and submitted 2 quarterly reports to EPA on 11/2/23 and 2/2/24. DEQ will maintain compliance throughout the remainder of the grant's period of performance.

Organization Contact: Alison Riley

Project Title: CAA Section 105 - Performance Partnership Grant

Assistance Agreement Number: EPA #BG-98392507-3: \$9,020,603 (Federal); 8,734,698 (Match)

Federal or Non-Federal Funding Agency and Assistance Listing Number: 66.605

Description: DEQ received funding to improve and maintain the public's air quality by reducing diesel emissions and promoting cost effective opportunities for consumers, businesses, state and local governments and other organizations to invest in GHG emissions reductions. DEQ has received Clean Air Act Section 105 air quality program support funding since 1993 and has a well-established annual process of reporting and holding meetings on grant status with EPA. This includes the development of grant commitments, a mid-year status meeting, and biennial formal status reports.

Organization Contact: Rachel Mirro

b. Reporting Requirements

With the understanding that data is key to ensuring that communities needs are being addressed and that desired program outcomes are in fact being achieved, the Virginia DEQ and its partners have historically been providing compliant data and progress reports to local, state, and federal agencies over the last 10 years. Specifically for the past performances listed in the prior section, the Virginia DEQ and its partners have submitted interim and/or final reports that were accepted and approved by the grantors and provided sufficiently detailed and timely progress reports towards achieving goals, objectives, outputs, and outcomes under the agreements with satisfactory results and no audit findings.

c. Staff Expertise

Virginia DEQ is the environmental agency for the Commonwealth and is responsible for administering laws and regulations for air quality, water quality, water supply, and renewable energy, as well as land protection. The DEQ staff biographies are provided below. VA Energy staff possess considerable experience in coal mine methane issues through the agency's work regulation extractive industries and remediating formerly mined lands. VA Energy has a long history of being partners with Virginia DEQ. All key staff identified below are prepared to both administer the grant program and ensure appropriate reporting needs are met.

Michael Dowd, Director, Air & Renewable Energy Division, DEQ

Role: Oversees air quality planning, permitting, compliance, monitoring, and mobile source programs, as well as the Small Renewable Energy Permit by Rule program.

Education: Bachelor of Arts, Columbia University, 1979; Juris Doctor (J.D.), Vermont Law School, 1982.

Experience: Prior to becoming Air Director, Mr. Dowd served as DEQ's Enforcement Director. Before joining DEQ, Mr. Dowd was an attorney in private practice with law firms in Richmond, Va., Washington, D.C., and Columbus, Ohio. Mr. Dowd is a recipient of EPA's Bronze Medal and serves as Co-Chair of the Enforcement Committee of the National Association of Clean Air Agencies, Chair of PJM Environmental-Energy Regulators, on the Board of Directors and Past Chair of the Mid-Atlantic Regional Air Management Association, and Southeast States Air Resource Managers, Inc., and on the Executive Committee of the National Council on Electricity Policy.

Thomas Ballou, Manager, Office of Air Data Analysis and Planning, DEQ

Role: Develops air quality plans, tracks air quality improvement, and develops air pollutant emissions inventories.

Education: Bachelor of Science in Environmental Science, Shippensburg University in Pennsylvania, 1983.

Experience: Mr. Ballou successfully led the Commonwealth's Priority Climate Action Plan (PCAP) to completion. He has been with the DEQ air program for over 30 years and has extensive knowledge and experience in the development of air quality plans, programs, and emissions inventories. Mr. Ballou has directed the development of statewide GHG emissions inventories and worked on other state climate initiatives such as planning and implementing a state carbon trading rule and program for the Virginia power sector, including participation in the Regional Greenhouse Gas Initiative (RGGI). He has also directed the development and adoption of Virginia's advanced clean cars regulation. Before coming to the DEQ, he worked for the Air Division of the US EPA regional office in New York, and the New Jersey DEP.

Angela Conroy, Senior Air Quality Planner, DEQ

Role: Supports climate change planning efforts, including CPRG, greenhouse gas planning efforts (e.g., RGGI and transportation initiatives), and manages Virginia's \$96.3 million allocation under the Volkswagen Environmental Mitigation Trust on behalf on the Commonwealth of Virginia.

Education: Bachelor of Science (B.S.) in Environmental, Ferrum College; Master of Business Administration (M.B.A.), and Master of Science (M.S.) in Environmental Management, University of Maryland, 2009; Graduate Studies in Urban and Regional Planning, Virginia Tech; Certified Sustainable Development Professional, Association of Energy Engineers.

Experience: Ms. Conroy has 20 years of experience in environmental program and project management for federal government agencies including but not limited to the U.S EPA, DOE, DOD, Department of Interior, and the Veterans Administration. She has co-authored technical guidance such as *Best Practices for Siting Photovoltaics on Municipal Solid Waste Landfills*, and published articles for the Global Association of Risk Professionals and other non-profit organizations.

Ava Lovain, Greenhouse Gas Inventory Specialist, DEQ

Role: Responsible for updating Virginia's annual greenhouse gas inventory and aiding in the office's climate planning efforts as an Air Emissions Coordinator.

Education: Bachelor of Science in Environmental Resources Management; Minors in Forestry and National Security, Virginia Tech, 2023.

Experience: Ms. Lovain has been supporting DEQ throughout the Climate Pollution Reduction Grant program, most recently throughout the development of the Priority Climate Action Plan. Prior to joining DEQ, she worked in forest analytics and carbon inventories as a Natural Resource Technician.

Sharon Baxter, Director of the Division of Environmental Enhancement, DEQ

Role: Directs the Virginia Department of Environmental Quality's Division of Environmental Enhancement, which includes the agency's Office of Pollution Prevention, Office of Environmental Impact Review and Long-Range Priorities, and Virginia Coastal Zone Management Program.

Education: Bachelor of Arts (B.A.) in Political Science and Geography, University of Delaware; Master's degree in Environmental Planning, University of Virginia.

Meghann Quinn, Manager of the Office of Pollution Prevention (Grant Manager), DEQ

Role: Developed the environmental management system, P2 efforts, and performances grant management. She has extensive experience implementing EMS programs, working with various entities, and contributing to environmental excellence initiatives in Virginia.

Education: Bachelor of Science (B.S.) in Environmental Science, University of Mary Washington; Master of Science (M.S.) in Environmental Studies, Virginia Commonwealth University

Morgan Goodman, P2 Specialist, Department of Environmental Quality, DEQ

Role: Participate in VEEP implementation team, conducting application reviews, taking part in facility site visits, and providing assistance to VEEP members.

Education: Bachelor of Science in Marine Biology, Roger Williams University; Master of Arts in Environmental Resource Policy; George Washington University.

Brent Williams, Office of Financial Responsibility and Waste Programs, Division of Land Protection and Revitalization, DEQ.

Role: Implements the statewide multimedia financial assurance programs, coordinates the Solid and Hazardous waste permitting and compliance programs, as well as the statewide reporting requirements for solid waste tonnage and recycling rate reports.

Education: M.B.A., Radford University. Radford ; B.S. Environmental Science, Concentration Areas: Land Resource & Waste Management, Virginia Tech; A.S. Turf and Landscape Management. Virginia Tech.

Daniel Kestner, Economic Development Program Manager, VA Energy

Role: Works in programs aimed at repurposing mine lands and improving Virginia's competitiveness.

Education: B.S. in Geography from Radford University

7. BUDGET

a. Budget Detail

DEQ and VA Energy are proposing a total budget of \$99,999,999. Please see attachments *Budget_VADEQ.pdf* and *BudgetCalcs_VADEQ.xlsx* for budget details.

b. Expenditure of Awarded Funds

DEQ has established sound fiscal and accounting policies that govern the expenditure of grant funds. All processes, procedures and internal controls outlined in DEQ's policies are in compliance with the statewide policies and authoritative guidance issued by the Virginia Department of Accounts through its Commonwealth Accounting Policies and Procedures Manual. DEQ's fiscal and accounting policies help to ensure that grant funds are expended in a timely and efficient manner. DEQ assigns a Grant Accountant to each awarded grant who reviews, tracks and monitors expenditures relative to the grant budget and project period to ensure accuracy and that funds are expended timely. Grant Accountants prepare monthly grant expenditure reports for Program Managers and upper Financial Management for an additional review for accuracy and to help inform of ongoing grant expenditure decisions. Grant accounting staff and program managers are in regular communication about expenditures. DEQ has also established procurement policies that govern the selection of contractors and vendors. All such policies are in compliance with the Virginia Public Procurement Act. These policies help to ensure that the process for selecting contractors and vendors is fair, impartial and transparent and that all third-party services, including those underwritten by grant funds, are procured at a reasonable price.

c. Reasonableness of Costs

As outlined in the Budget Spreadsheet and Budget Narrative attachments for Budget Detail 7.a, all projected costs are proportionate to the program requirements and are based on current rates or past contracts.

The total personnel costs across the three programs, which are based on the rates of current staff members from various Commonwealth departments without a salary increase, are expected to be approximately \$798,000 with an additional \$375,060 going towards fringe benefits. Virginia DEQ will use \$1,500,001 for administrative costs covering a variety of essential expenses that allows DEQ to operate efficiently and compliantly. These costs are divided among the three programs.

For Program 1, VA Energy will utilize \$52,000,000 for year one for contractual services to procure and deploy equipment for CMM capture and utilization through projects and \$7,000,000 for each of four subsequent years for additional deployment and upgrades of CMM equipment required to reach targets of 1MMtCO₂e reductions. VA Energy will utilize \$497,880 for staff and fringe costs and \$121,704 for indirect costs (which is in accordance with U.S. Department of Interior indirect rate agreement) at the rate of 35.2% to cover the following categories: salaries, salary compensation raises, leave payout and a

deferred compensation-matching plan. \$48,900 is being requested by VA Energy to cover up to four staff members' travel expenses to attend meetings throughout the year, which are based on historical costs in accordance with state regulations and federal per diem. \$36,000 is also included for travel for associated annual meetings. Virginia DEQ expects to support VA Energy with four staff members, which will cost \$48,000, in addition to \$22,560 in fringe benefits and another \$18,480 in indirect costs. An annual travel budget of about \$1,000 will be allocated to support staff site visits which may include lodging, per diem, and mileage. The total cost of this program is \$80,798,757.

Virginia DEQ is requesting \$9,581,310 for the Landfill Methane Capture & Utilization program (Program 2). The following are the programmatic costs Virginia DEQ anticipates to design and implement the new program. Virginia DEQ expects to receive support from five staff members, which will cost \$365,000, in addition to \$171,550 in fringe benefits and another \$140,525 in indirect costs. An annual travel budget of about \$1,295 per year for each of the five years will be allocated to support staff site visits which may include lodging, per diem, and mileage. Over the program period \$8,897,757 will be allocated toward competitive multi-year grants for the Food Rescue and Composting program.

Virginia DEQ has included \$9,619,932 for the Food Rescue and Composting program (Program 3). This program amount can be broken down into the following costs. Staff Support: Virginia DEQ expects to receive support from five staff members, which will cost \$385,000, in addition to \$180,950 in fringe benefits and another \$148,225 in indirect costs. An annual travel budget of about \$1,000 per year for each of the five years will be allocated to support outreach and site visits. \$3,000 will be allocated for supplies costs to support the program. Over a period of three years, about \$2,949,252 will be allocated annually toward 15 to 20 competitive multi-year grants for the Food Rescue and Composting program. An additional \$50,000 will be allocated for contractual expenses with other state organizations that present barriers to food donation.