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January 31, 2024

Ms. LaKesha Hart
Grantee Project Manager
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Dear Ms. Hart:

The State of Louisiana Division of Administration Quality Assurance Project Plan (QAPP) for the Climate Pollution Reduction Grant Project, Q-Trak No. 24-111. I am pleased to inform you that the QAPP has been reviewed and approved by Michael Gildner, R6 Air QA Coordinator, Region 6, EPA. The QAPP has an expiration date of December 11, 2025.

Please send all QAPP's **sixty days prior to** the expiration of the recipient's approved QAPP, if there are any significant changes to operating procedures or regulations, please submit earlier than sixty-days. The recipient shall submit to the Project Officer a revised QAPP or certification that the QAPP is current and include a signed copy of the new approval page(s) for the QAPP.

Please find attached your digitally signed QAPP signature page(s), should you have any questions, please call me at (214) 665-8453.

Sincerely,

**TERRIE
WRIGHT**

Terrie Wright
Project Officer
Air Grants Section

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Enclosures
cc: Grant File



Quality Assurance Project Plan for the Climate Pollution Reduction Grant

Grant Number (FAIN): 02F36401

Environmental Information Operations by: The Water Institute

QAPP Developed by: Louisiana Division of Administration

Period of Applicability: June 1, 2023 - June 1, 2027

Date: December 7, 2023

Version 1

APPROVAL PAGE

Document Title: Quality Assurance Project Plan for the Climate Pollution Reduction Grant

Document Short Title: Louisiana CPRG QAPP

Organization: State of Louisiana Division of Administration

Office of Planning & Budget
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DOCUMENT CONTROL

Document Title: Quality Assurance Project Plan for the Climate Pollution Reduction Grant

Note: Actions older than 5 years may be removed from this record.

Table 1: Review and Revision Record

Approval Date	Revision No.	Record of Activity
October 20, 2023	0 (Original)	Initial approval by Grantee PM and Project QAM prior to EPA submission.
December 7, 2023	1	Revisions made to Sections A8, A9, B5 and B6 in response to EPA’s review on 12/4/2023.

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ABBREVIATIONS

ALU	Agriculture and Land Use National Greenhouse Gas Inventory Software
AVERT	AVoided Emissions and geneRation Tool
CAA	Clean Air Act
CCAP	Comprehensive Climate Action Plan
CEPEX	Center for Planning Excellence
CFR	Code of Federal Regulations
CPM	Contractor Project Manager
CPRG	Climate Pollution Reduction Grant
DOA	Division of Administration
EPA	U.S. Environmental Protection Agency
ESIST	Energy Savings and Impacts Scenario Tool
GCAM	Global Change Analysis Model
GHG	Greenhouse Gas
GHGRP	Greenhouse Gas Reporting Program (40 CFR Part 98)
GLIMPSE	GCAM Long-Term Interactive Multi-Pollutant Scenario Evaluator
GPM	Grantee Project Manager
ICR	Information Collection Request
LDEQ	Louisiana Department of Environmental Quality
LMOP	Landfill Methane Outreach Program
LSU	Louisiana State University
MOVES	Motor Vehicle Emission Simulator
OAR	EPA Office of Air and Radiation
OPB	Office of Planning & Budget
PCAP	Priority Climate Action Plan
PI	Principal Investigator
PM	Project Manager
PO	EPA Project Officer for Grant
POP	Period of Performance
POR	EPA Project Officer's Representative
PQAM	Project Quality Assurance Manager
PWP	Project Work Plan
QA	Quality Assurance
QAM	Quality Assurance Manager
QAMD	Quality Assurance Manager Delegate
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCC	Quality Control Coordinator
QMP	Quality Management Plan
RL	Research Lead
SIT	State Inventory Tool
TAG	The Accelerate Group
TL	Task Leader
TWI	The Water Institute

GROUP A: PROJECT MANAGEMENT AND INFORMATION/DATA QUALITY OBJECTIVES

A1. TITLE PAGE

See the included *Title Page*, in alignment with EPA Standard, Directive # CIO 2105-S-02.0.

A2. APPROVAL PAGE

See *Approval Page*, in alignment with EPA Standard, Directive # CIO 2105-S-02.0.

A3. TABLE OF CONTENTS, DOCUMENT FORMAT, AND DOCUMENT CONTROL

TABLE OF CONTENTS

Please refer to the *Table of Contents*, including the location of sections, tables, diagrams, charts, and appendices, as applicable.

DOCUMENT FORMAT

To expedite review and approval, this QAPP follows the format and section headings of EPA Standard, Directive # CIO 2105-S-02.0. This document is organized into the following four groups:

- [Group A](#): Project Management and Information/Data Quality Objectives
- [Group B](#): Implementing Environmental Information Operations
- [Group C](#): Assessment and Oversight
- [Group D](#): Environmental Information Review and Usability Determination

DOCUMENT CONTROL

Details regarding document control are provided in *Table 1: Review and Revision Record* on Page 2. This section includes details on the document title, the version number of the document, the date of the version, and the page number in relation to the total number of pages.

A4. PROBLEM DEFINITION, PROJECT PURPOSE, AND BACKGROUND

PROBLEM DEFINITION

Climate change is a global threat being driven by human-induced increases in GHG concentrations in the atmosphere that have raised global temperatures and made extreme weather more common. In 2019, carbon dioxide (CO₂) concentrations in the atmosphere were at their highest over the last 2 million years, and 19 of the 20 warmest years on record have occurred since 2007, arctic summer sea ice reached its lowest level on record in 2012, and

global average sea level has risen faster in the past century than at any time in the past 1000 years. The unprecedented fires, droughts, floods, and heatwaves the world is already experiencing will intensify as global temperature continue to go up putting millions of lives and trillions of dollars of assets at risk. Throughout this ongoing upheaval, the most severe impacts have and will continue to fall on the poor and otherwise marginalized communities.

The National Climate Assessment produced four key messages for the southeastern region of the U.S., and each resonates deeply with Louisiana:

1. *Urban Infrastructure and Health Risks.* Compared to cities in other regions of the country, cities in the southeast are particularly vulnerable to climate change impacts to infrastructure and human health specifically from increasing heat, flooding, and vector-borne diseases.
2. *Increasing Flood Risks in Coastal and Low-Lying Regions.* Home to people, critical industries, cultural resources, and tourism economies, the coastal plain and low-lying regions of the southeast are extremely vulnerable to climate change impacts. Flood frequencies, extreme rainfall events, and sea level rise will affect property values and the viability of infrastructure.
3. *Natural Ecosystems will be Transformed.* Diverse natural ecosystems that provide multiple social benefits will be transformed by climate change through changing winter temperature extremes, wildfire patterns, sea levels, hurricanes, floods, droughts, and warming oceans that will redistribute species and greatly modify ecosystems.
4. *Economic and Health Risks for Rural Communities.* More regular extreme heat and changing seasonal climates are projected to have impacts on exposure-linked health and economic vulnerabilities in agricultural, timber, and manufacturing sectors. Reduced labor hours from extreme heat can also compound existing social stresses.

With climate risks manifesting every day and all but certain to grow in severity in the future, the need to reduce GHG emissions driving global warming is crucial. Reducing GHG emissions is a viable way to mitigate climate-related risks and increase opportunities for people and improve or protect their quality of life in the long run. As is made clear in national and international scientific reports, the evidence of human-caused climate change is overwhelming, the impacts of climate change are present today and intensifying, and the threats to physical, social, and economic well-being are on the rise.¹

¹ Lempert, R. J., Arnold, J. R., Pulwarty, R. S., Gordon, K., Greig, K., Hawkins-Hoffman, C., ... Werrell, C. (2018). Chapter 28: Adaptation Response (pp. 1309–1345). Washington D.C.: U.S. Global Change Research Program.
<https://doi.org/10.7930/NCA4.2018.CH2>

PROJECT PURPOSE AND BACKGROUND

The State of Louisiana seeks to build upon a robust, bottom-up, and multi-sector planning process that culminated in the unanimous approval of the state's first ever Louisiana Climate Action Plan (LCAP) in January 2022. In 2020, the LCAP planning process began when Governor Edwards signed Executive Order 2020-18, establishing the Climate Initiatives Task Force (CITF), and directing CITF to oversee an update to the state's greenhouse gas inventory and identify recommendations to set Louisiana on a path to reducing GHG emissions statewide by 40-50% below 2005 levels by 2030 and reaching net zero greenhouse gas (GHG) emissions by 2050. Governor Edwards's climate goals put the state in line with national pledges made under the Paris Agreement, and by the federal government, at least 25 other states, and hundreds of companies in the private sector. Based on the goals identified in EO 2020-18, Governor Edwards also joined the global Race to Zero campaign ahead of COP26.

The Louisiana Climate Action Plan (LCAP) embodies the inclusive, transparent framework and emissions reduction outcomes identified in the Climate Pollution Reduction Grants (CPRG) guidance. The LCAP contains a balanced set of recommendations to limit the severity of climate change while positioning the state to reduce other co-pollutants, improve quality of life, and maintain its economic competitiveness in a low-carbon future. The LCAP puts forth 28 strategies and 84 specific actions to reduce GHG emissions across the entire state economy. The plan was developed over a 15-month process encompassing over 49 public meetings and multiple rounds of public and stakeholder comments. The Task Force, its six sector committees, and its four advisory groups represent over 140 people who bring a variety of perspectives across government, business, academia, and environmental and community advocates. Similar to the state's Climate Action Plan, the Priority Climate Action Plan (PCAP), Comprehensive Climate Action Plan (CCAP), and the Status Report will consider the entire geographical region of the state as the State of Louisiana plans for GHG emissions reduction efforts.

The PCAP will build on priorities identified in the LCAP and will focus on high impact and actionable priorities to be determined based on interagency, intergovernmental, stakeholder, and public engagement. The PCAP will focus, in part, on the state's industrial emissions, which account for approximately two-thirds of the state's greenhouse gas emissions and represent a significant opportunity to reduce co-pollutants and improve public health. The CPRG core planning team will identify a set of draft focus areas (e.g., sectors or programs) that will catalyze further implementation of the LCAP. The CPRG core planning team will then present the set of PCAP action items for comment and input (including solicitation of additional action items for inclusion in the PCAP) from the Climate Initiatives Task Force, its committees and advisory groups, and the public. Once the draft focus areas of the PCAP are determined, the CPRG core planning team will solicit additional input and recommendations from stakeholders most impacted or implicated by the priorities to further refine the PCAP. The state will publish the PCAP by January 2024.

Due approximately 3.5 years after the completion of the LCAP, the CCAP will provide a timely opportunity to comprehensively update the state's Climate Action Plan. The CCAP will not only serve as an opportunity to account for the significant climate action taken since January 2022 and the funding opportunities provided in the Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA); it will also serve as an opportunity to recalibrate

strategies and actions based on evolving stakeholder input, the latest emissions reduction technology, and the state of climate science. The CCAP will incorporate or build on the contents of the 2022 LCAP and PCAP.

The Status Report, due in summer/fall of 2027, will include the implementation status of the quantified GHG reduction measures included in the CCAP. The status of implementation of the CCAP will take the same or similar approach that the 2023 Climate Action Plan annual report took. The Status Report will also update analyses or projections supporting CCAP implementation, as needed. Lastly, the Status Report will identify next steps and future budget/staffing needs to continue CCAP implementation.

STATE OF LOUISIANA'S CLIMATE OBJECTIVES

Through the establishment and implementation of the PCAP and the CCAP, the state seeks to:

1. **Reduce/minimize Net GHG Emissions**
2. **Improve Quality of Life for Residents and Communities**
 - a. Maximize quality of and access to essential goods, services, and infrastructure for residents.
 - b. Maximize positive public health outcomes and public safety.
 - c. Maximize the preservation of cultural heritage.
3. **Create a More Equitable Society**
 - a. Reduce socioeconomic, demographic, and geographic disparities in future opportunities and outcomes.
 - b. Maximize reduction and mitigation of historic and structural inequities and their impacts for underserved and marginalized communities, including communities of color and Indigenous peoples.
 - c. Maximize engagement with and participation of communities in decision-making and implementation.
4. **Manage for Short- and Long-Term Success**
 - a. Maximize confidence of the public and stakeholders in the outcome of emissions-reduction strategies to increase support for their implementation.
 - b. Maximize the efficiency and effectiveness of emissions-reduction strategies.
 - c. Maximize timely implementation of emissions-reduction strategies.
 - d. Maximize the durability of emissions-reduction strategies in an uncertain future.
5. **Strengthen the Economy and Workforce**
 - a. Maximize employment, economic opportunity, and support for Louisiana workers.
 - b. Maximize economic growth.
6. **Conserve Natural Resources and Protecting the Environment**
 - a. Maximize preservation of natural resources and ecosystem services.
 - b. Maximize environmental stewardship and support of healthy ecosystems.
7. **Adapt to a Changing Climate**
 - a. Increase resilience of the built and natural environment to climate change.
 - b. Increase the resilience of communities to climate change.

CRITICAL DECISIONS

Critical decisions will vary depending on the specific data source and analysis type. For example, existing EPA datasets and the SIT cover categories of GHG emissions by sector and by activity or segment. The SIT provides many default values to facilitate developing statewide estimates that are consistent with the National Inventory of GHG Emissions.² Task Leaders will be charged with three primary decisions under each task of this project:

1. Determine (for each major activity estimate) if existing EPA data or the SIT default estimate for the sector/activity should be used for the statewide, baseline estimate, or should the state's estimate be derived from existing information available to the state (including other EPA datasets, state inventories, or GHGRP publications).
2. Determine the best options for reducing emissions of air pollution and achieving the following objectives³ under the Inflation Reduction Act:
 - a. Reduce climate pollution, create good jobs, and lower energy costs for families.
 - b. Accelerate work addressing environmental injustice and empowering community driven solutions in overburdened neighborhoods.
 - c. Deliver cleaner air by reducing harmful air pollution in places where people live, work, play, and go to school.
3. Develop an estimate (or range) of reductions that could be achieved under each option.
4. Estimate the uncertainty of the emissions reduction estimate under each option.

A5. PROJECT TASK DESCRIPTION

The CPRG Planning Phase (Phase 1) includes the development of three key deliverables, segmented into various subtasks, as summarized in *Table 2: Project Tasks* and in *Appendix C: State of Louisiana Climate Pollution Reduction Grants Timeline*. This project will be executed by the Core Planning Group, comprised of LaKesha Hart (DOA) and individuals from three contractors: The Water Institute (TWI), the Center for Planning Excellence (CPEX) and The Accelerate Group (TAG). As the leading non-profit applied research institution in the state, TWI is responsible for overall program management and for performing environmental information operations for this grant program. Therefore, this QAPP emphasizes TWI's scope of work. The key deliverables are as follows:

Deliverable 1: Louisiana's **Priority Climate Action Plan (PCAP)**, which is due on March 1, 2024. This plan will include near-term, implementation-ready, priority GHG reduction measures and is a prerequisite for any implementation grant.

² <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021>

³ [CPRG Program Guidance](https://www.epa.gov/inflation-reduction-act/climate-pollution-reduction-grants#CPRGProgramGuidance), page 4. Available at <https://www.epa.gov/inflation-reduction-act/climate-pollution-reduction-grants#CPRGProgramGuidance>.

Deliverable 2: Louisiana’s **Comprehensive Climate Action Plan (CCAP)**, which is due in 2025 (later for tribes and territories). This plan will review all sectors that are significant GHG sources, and include both near- and long-term GHG emission reduction goals and strategies.

- The Priority Climate Action Plan (PCAP) will be developed through a collaborative process, among local, state and private stakeholders, and focus, in part, on the state’s industrial emissions, which account for approximately two-thirds of the state’s greenhouse gas emissions.

The PCAP and the CCAP will build on the priorities identified in the 2022 Louisiana Climate Action Plan with the goal of implementing the most critical plan recommendations. The Louisiana Climate Action Plan guides outcomes of the CPRG. Developed in 2021, the plan resulted from a 2021 update to the state’s Greenhouse Gas Inventory, which was completed by Louisiana State University using the EPA’s State Inventory Tool (SIT). TWI previously supported the development of the Louisiana Climate Action Plan, which was released in February 2022, and the 2023 Annual Report, released in February 2023.

Deliverable 3: Louisiana’s **Status Report** on progress towards goal, which is due in 2027. This progress report will include updated analyses, plans, and next steps for key metrics.

It is anticipated that all tasks performed as part of Phase 1 of this grant program will involve existing air quality data and information only. *Table 2: Project Tasks* summarizes the core tasks that involve the analysis and management of environmental information, as well as the timeframes for completion of each task. For a detailed list and timeline of all tasks to be performed, please reference *Appendix C: State of Louisiana Climate Pollution Reduction Grants Timeline*.

Table 2: Project Tasks

Tasks	Description of Support for Program Objectives	Timeframes
1. Investigate and determine greenhouse gas emissions modeling capacity and tools	TWI will conduct a wide scan of models, datasets, quantification techniques, and tools for investigating the emissions reduction potential of various policies and projects. Building off the work of the Louisiana Climate Action Plan, which used a Structured Decision-Making process and two rounds of Consequence Analysis to assess alternatives, this will go beyond the Energy Policy Simulator tool used for that effort and will expand to the many tools, models, and datasets developed by EPA and other federal agencies. This may include, but is not limited to, Motor Vehicle Emission Simulator (MOVES), AVOIDED Emissions and geneRation Tool (AVERT), EPA Energy Savings and Impacts Scenario Tool (ESIST), AgSTAR, Agriculture and Land Use National Greenhouse Gas Inventory Software (ALU), Landfill	2023-2024

Tasks	Description of Support for Program Objectives	Timeframes
	Methane Outreach Program (LMOP), GCAM ⁴ Long-Term Interactive Multi-Pollutant Scenario Evaluator (GLIMPSE), and other national reports, blueprints, guides, initiatives, databases, and training manuals. This may also include reviewing relevant peer-reviewed literature for work where EPA may not have a fully developed tool, such as wetland carbon.	
2. GHG modeling of policy priorities for the PCAP	The Louisiana Climate Action Plan, community and stakeholder input, and other factors inform the State’s priorities. TWI will use tools, models, datasets, and other information as described above (Task 1) to quantify the potential GHG emissions and co-pollutant reductions of policy priorities as defined by the State of Louisiana. This may include top-down (sector level) or bottom-up (project level) estimates, as necessary. TWI will document all assumptions, methodologies, data sources, calculations, and results. All results will be published either in the PCAP itself or in a technical appendix or memorandum directly published by the Water Institute.	2023-2024
3. Update the state’s GHG inventory	Because the CCAP requires an updated state-level greenhouse gas inventory, TWI will use the latest version of the EPA State Inventory Tool and supplemental analyses to update the 2021 Louisiana Greenhouse Gas Inventory. TWI will ensure consistency with all previous GHG inventories developed by LSU and the State of Louisiana. This updated inventory will be completed for each sector listed in the 2021 inventory and will be cross-checked against the available state-level data from the latest version of the Louisiana Energy Policy Simulator, which draws upon additional data from the National Renewable Energy Laboratory (NREL) and the US Energy Information Administration (EIA). TWI’s experience in correlating the 2021 Inventory with the Louisiana EPS model found that they were complementary, largely from the EPS drawing upon the same EPA data.	2023-2024

4 GCAM is the “Global Change Analysis Model”

Tasks	Description of Support for Program Objectives	Timeframes
4. GHG modeling of policy priorities for the CCAP	As with the PCAP, TWI will use tools, models, datasets, and other information as described above (Task 1) to quantify the potential GHG emissions and co-pollutant reductions of policy priorities as defined by the State of Louisiana. This may include top-down (sector level) or bottom-up (project level) estimates, as necessary. The Institute will rigorously document all assumptions, methodologies, data sources, calculations, and results. All results will be published either in the PCAP itself or in a technical appendix or memorandum directly published by the Water Institute. The CCAP will also include an updated net zero pathway and will provide sector-level analyses of current emissions.	2024 and first half of 2025
5. Status report support	TWI will support the Status Report development with modeling and analyses as needed.	Summer/Fall of 2027
6. Workforce analyses support	For the PCAP and CCAP, TWI will use data from relevant state agencies, such as Louisiana Economic Development, or local groups, such as Baton Rouge Area Chamber, with specialized workforce planning data. Additional workforce needs and opportunities may be qualitatively described, supplemented with federal resources, such as data from the Bureau of Labor Statistics, the Federal Reserve or other sources.	October 2023; September 2024 to March 2025
7. LIDAC and community benefits analyses support	For the PCAP and CCAP, TWI will identify LIDAC census tracts and block groups using screening tools such as CJEST. The Institute will draw upon our deep experience in assessing and quantifying community vulnerability as well as quantifying community benefits to provide qualitative and quantitative assessments of benefits to low income and disadvantaged communities.	October 2023; September 2024 to March 2025

A6. INFORMATION/DATA QUALITY OBJECTIVES AND PERFORMANCE/ACCEPTANCE CRITERIA

DATA QUALITY OBJECTIVES AND ACCEPTANCE CRITERIA

For this project, TWI will use a variety of QC techniques and criteria to ensure the quality of data and analyses. Data of known and documented quality are essential components for the success of the project, as these data will be used to inform the decision-making process for Louisiana's PCAP and CCAP as discussed in Section A5. *Project Task Description*. The tables in *Appendix A: Check Lists of Quality Control Activities for Deliverable* lists by task the specific QC techniques and criteria that can be performed under this project. Additionally, the Division of Administration (DOA) adopted the Louisiana Department of Environmental Quality (LDEQ) Quality Management Plan (QMP, Revision 18), as approved by EPA Region 6 on July 25, 2023, for the purposes of managing overall quality under this project.

The data quality objectives and criteria for this project are accuracy, precision, bias, completeness, representativeness, and comparability. Accuracy is a measure of the overall agreement of a measurement to a known value. It includes a combination of random error (precision) and systematic error (bias). Precision is a measure of how reproducible a measurement is or how close a calculated estimate is to the actual value. Bias is a systematic error in the method of measurement or calculation. If the calculated value is consistently high or consistently low, the value is said to be biased. Our goal is to ensure that information and data generated and collected are as accurate, precise, and unbiased as possible within project constraints.

Generally, existing data and tools provided by the EPA and other qualified sources will be used for project tasks. A subject matter specialist familiar with technical reporting standards (such as a permit writer or compliance engineer with knowledge of the state's facilities operating in the sector) will be used to QA all data utilized for this project. TWI will verify the accuracy of all data by checking for logical consistency among datasets. All existing environmental data shall meet the applicable criteria defined in CFR and associated guidance, such as the validation templates provided in the EPA *QA Handbook Volume II*.

Uncertainty can be evaluated using a few different approaches. The most useful uncertainty analysis is quantitative and is based on statistical characteristics of the data such as the variance and bias of estimates. In a sensitivity analysis, the effect of a single variable on the resulting emissions estimate generated by a model (or calculation) is evaluated by varying its value while holding all other variables constant. Sensitivity analyses will help focus on the data that have the greatest impact on the output data. Additional statistical tests may be utilized depending on the need for more or less rigorous tools and on the specific project activity being evaluated.

When available, data originally gathered using published methods whose applicability, sensitivity, accuracy, and precision have been fully assessed, such as EPA reference methods, will be preferred and considered to be of acceptable quality. Project decisions may be adversely impacted if, for example, existing data were used in a manner inconsistent with the originator's purpose.

Metadata can be described as the amount and quality of information known about one or more facets of the data or a dataset. It can be used to summarize basic information about the data (e.g., *how*, *why*, and *when* the existing data were collected), which can make working with specific data or datasets easier and provides the user with more confidence. Metadata are valuable when evaluating existing data, as well as when planning for collection primary data that may be required in the future. However, the effort needed to locate and obtain original source materials can be costly. Accordingly, a graded approach to planning will be applied, and if deemed necessary by the Core Planning Group, ongoing discussions with the EPA will be held to determine what magnitude and rigor of QA effort are appropriate for the project.

For the data analysis completed under this project, analytical methods will be reviewed to ensure the approach is appropriate and calculations are accurate. Spreadsheets will be used to store data and complete necessary analyses. Design of spreadsheets will be configured for the intended use. All data and methodologies specific to each analysis will be defined and documented. Tables and fields will be clearly and unambiguously named. Spreadsheets will be checked to ensure algorithms call data correctly and units of measure are internally consistent. Hand-entered or electronically transferred data will be checked to ensure the data are accurately transcribed and transferred.

The draft GHG inventory will be evaluated for GHG-emitting-sector and geographic completeness. TWI will utilize the framework of sectors in the EPA's SIT tool or the EPA's state-level GHG inventories to ensure that the inventory prepared under this project includes all major GHG-emitting sectors. To ensure the inventory is geographically complete, the draft inventory will also be submitted for review by the OPB (in coordination with TWI) to LDEQ staff within the state's regional offices or by stakeholders from the various regions of the state to ensure that all major-emitting activities in all regions of the state are included in the inventory.

Representativeness is a qualitative term that expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. TWI will use the most complete and accurate information available to compile representative data for this project.

Data comparability is a qualitative term that expresses the measure of confidence that one dataset can be compared to another and can be combined for the decision(s) to be made. TWI will compare datasets when available from different sources to check for the quality of the data. This QA step will also ensure that any highly correlated datasets or indicators are identified. Supporting data, such as information on test methods used and complete test reports, are important to ensure the comparability of emissions data.

CRITERIA FOR ACCEPTING EXISTING DATA FOR INTENDED USE

TWI will rely on existing data from EPA and other federal agencies for completion of the identified tasks. Where supplemental data are required, TWI, following the secondary data quality ranking hierarchy (presented in *Table 4: Existing Data Quality Ranking Hierarchy* in Section D2), will review state agency data, peer-reviewed literature, and, where appropriate, internal research. All uses of non-federal data will be reviewed by TWI senior scientists, in coordination with OPB PM, and strictly following this QAPP.

Regarding the criteria for determining whether the data are acceptable, it is expected that the process will be based on a comparison of the associated emissions estimate to the emissions estimate produced using the EPA's SIT. While some differences between the state's calculations and SIT calculations are expected, differences of more than 10% will be accompanied by an explanation subject to approval by the EPA prior to using the state's estimate in lieu of the SIT estimate.

PERFORMANCE CRITERIA

Performance criteria address the adequacy of information that is to be collected project. These criteria generally apply to new information collected for a specific use. It is anticipated that all tasks performed as part of Phase 1 of this grant program will involve existing air quality data and information only. For this reason, this QAPP addresses acceptance criteria in lieu of performance criteria.

RELEVANT CLEAN AIR ACT MANDATES AND AUTHORIZATIONS

The inventory and options analyses produced under this project will support a grant application authorized under 42 U.S.C.A. § 7437 for *Greenhouse Gas Air Pollution Plans and Implementation Grants*. The inventory and options analyses will be used to evaluate opportunities for reducing GHG emissions from all major-emitting sources including both mobile source categories and stationary source categories. This project will include the fundamental research necessary to evaluate and plan new programs (and amendments to existing Clean Air Act [CAA] programs) for reducing emissions from fossil fuel combustion activities. Many sectors and activities that will be included in the GHG inventory (and subsequent emissions reductions options analyses) include major sources of criteria and toxic pollutants. Accordingly, the purpose of this project (to evaluate and plan for reductions in GHG emissions, including reductions from usage or production of fossil fuels) is also consistent with the following statutory mandates and authorizations under Clean Air Act Title I:

- **§ 7403. Research, investigation, training, and other activities**
 - (a) *Research and development program for prevention and control of air pollution*
The Administrator shall establish a national research and development program for the prevention and control of air pollution
 - (1) *conduct, and promote the coordination and acceleration of, research, investigations ... and studies related to the causes ... extent, prevention, and control of air pollution;*
 - (2) *encourage, cooperate with, and render technical services and provide financial assistance to air pollution control agencies and other appropriate public or private agencies, institutions, and organizations, and individuals in the conduct of such activities*
 - (b) *Authorized activities of Administrator in establishing research and development program*
In carrying out the provisions of [paragraph (a)] the Administrator is authorized to—
 - (1) *collect and make available, through publications and other appropriate means, the results of and other information, including appropriate recommendations by him in connection therewith, pertaining to such research and other activities;*
 - (2) *make grants to air pollution control agencies ... for purposes ... in subsection (a)(1)*

- **§ 7404. Research related to fuels and vehicles**

(a) *Research programs; grants;*

The Administrator shall give special emphasis to research and development into new and improved methods, having industry-wide application, for the prevention and control of air pollution and control of air pollution resulting from the combustion of fuels... he shall–

(1) *conduct and accelerate research programs directed toward development of improved , cost-effective techniques for–*

(A) *control of combustion byproducts of fuels,*

(B) *improving efficiency of fuels combustion so as to decrease atmospheric emissions*

- **§ 7405. Grants for support of air pollution planning and control programs**

(a) *Amounts; limitations; assurances of plan development capability.*

(1)(A) *The Administrator may make grants to air pollution control agencies ... in an amount up to three-fifths of the cost of implementing programs for the prevention and control of air pollution For the purpose of this section, “implementing” means any activity related to the planning, developing, establishing, carrying-out, improving, or maintaining of such programs....*

(C) *With respect to any air quality control region or portion thereof for which there is an applicable implementation plan under section 7410 ... grants under subparagraph (A) may be made only to air pollution control agencies which have substantial responsibilities for carrying out such applicable implementation plan.*

INFORMATION PROVIDED BY THE EPA UNDER § 7403(B)(1)

Under authority of CAA § 7403(b)(1) the EPA has provided the following resources to states to ensure reliable air emissions inventories are produced to support plans for reducing emissions:

- [Agency-wide Quality Program Documents](#)
- Quality Assurance-specific Directives
 - [CIO 2105.3](#) – *Environmental Information Quality Policy*, April 10, 2023
 - [CIO 2105-P-01.3](#) – *Environmental Information Quality Procedure*, March 7, 2023
 - [CIO 2105-S-02.0](#) – EPA’s Environmental Information QA Project Plan (QAPP) Standard
 - EPA Regional Sites for Quality Management Plans and Guidance:
 - [Region 1](#)
 - [Region 2](#)
 - [Region 3](#)
 - [Region 4](#)
 - [Region 5](#)
 - [Region 6](#)
 - [Region 7](#)
 - [Region 8](#)
 - [Region 9](#)

- [Region 10](#)
- QA Guidance
 - [EPA QA/G-4](#) – *Guidance on Systematic Planning Using Data Quality Objectives Process*
 - [EPA QA/G-5](#) – *Guidance for Quality Assurance Project Plans*

OPB, and TWI, will utilize these resources, as applicable, to ensure evaluation of existing data and utilization of those data are consistent with the EPA’s relevant directives and guidance.

A7. DISTRIBUTION LIST

This section lists individuals who will identify existing⁵ data resources for evaluation and potential use under the project, as well as those responsible for the implementation of the Quality Assurance Plan. An electronic copy of this approved QAPP will be maintained on the State of Louisiana Division of Administration’s Intranet Website. This QAPP will be distributed to the staff presented in *Table 3: QAPP Distribution List*. Additionally, this QAPP will be provided to any unlisted staff who are assigned to perform information/data operations under this project.

Table 3: QAPP Distribution List

Name	Organization	Role
Terrie Wright	US EPA, Region 6	Project Officer
Michael Gildner	US EPA, Region 6	EPA Quality Assurance Manager
LaKesha Hart	Division of Administration	Grantee Project Manager
Jean Cowan	The Water Institute	Contractor Project Manager
Allison DeJong	The Water Institute	Principal Investigator
Colleen McHugh	The Water Institute	Research Scientist III
Nastaran Tebyanian	The Water Institute	Research Lead
Patrick Kane	The Water Institute	Research Lead

⁵ The term “existing data” is defined by the EPA’s *Environmental Information Quality Policy* ([CIO 2105.3](#)) as “... data that have been collected, derived, stored, or reported in the past or by other parties (for a different purpose and/or using different methods and quality criteria). Sometimes referred to as data from other sources.” The term “secondary data” may also be used to describe “existing data” in historical EPA quality-related documents.

Name	Organization	Role
Brittany Jensen	The Water Institute	Project Quality Assurance Manager

A8. PROJECT ORGANIZATION

As introduced in Section A5, this project will be executed by the Core Planning Team, comprised of LaKesha Hart (DOA) and individuals from three contractors: The Water Institute of the Gulf (TWI), the Center for Planning Excellence (CPEX) and The Accelerate Group (TAG). As the leading non-profit applied research institution in the state, TWI is responsible for overall program management and for performing environmental information operations for this grant program. Therefore, this QAPP emphasizes TWI’s scope of work.

CPEX will perform tasks relating to interagency coordination and public outreach, drafting of plans, and other tasks as specified in the approved workplan. TAG will also contribute to interagency coordination, as well as coordinating committee and advisory group meetings and other stakeholder coordination tasks.

The primary personnel responsible for implementation of this project are the Grantee Project Manager (GPM), the Contractor Project Manager (CPM), the Project Quality Assurance Manager (PQAM), the Principal Investigator (PI), and the Research Leads (RLs). Their duties are outlined briefly below:

The **Grantee Project Manager (GPM)**, Lakesha Hart, is the **senior state-level official** overseeing project implementation who maintains approval authority for the QAPP.

GPM responsibilities may include, but are not limited to:

- In coordination with the Principal Investigator, serve as the primary point of contact for project-related matters, including planning, implementation, budgeting, and other compliance-related matters.
- Oversee the development of the deliverables included in CPRG Workplan, to include the PCAP, CCAP, and the Status Report.
- Facilitate programmatic compliance for the grantee organization, including the submission of Quarterly Reports.
- Monitor and maintain the project budget.
- Maintain approval authority for the Quality Assurance Project Plan, including oversight of required modifications and subsequent versions.
- Facilitate stakeholder engagement, including conducting meetings with the public around the objectives of CPRG.

The **Contractor Project Manager (CPM)**, Jean Cowan, is the senior manager having executive leadership authority for the organization conducting the environmental information operations (TWI).

The specific responsibilities may include, but are not limited to:

- Provide resources to include knowledgeable personnel, funding, materials, and supplies.
- Provide research expertise and guide cross-team project management both inside and outside of TWI.
- Manage staffing to complete the tasks outlined in the CPRG workplan.
- Lead recurring meetings for project coordination and task tracking.
- Manage technical, budgetary, and schedule performance to ensure prompt completion of the PCAP, CCAP, and the Status Report.
- Provide monthly status updates to the Grantee Project Manager, indicating the progress of tasked outlined in the CPRG workplan.
- Support the adoption of the principles outlined in this QAPP.

The **Principal Investigator (PI)**, Allison DeJong, is the project Operations Manager responsible for organization around conducting environmental information operations.

The specific responsibilities may include, but are not limited to:

- Lead CPRG environmental operations, including designing and implementing activities across all tasks.
- Provide project management support.
- Provide research and planning expertise; support PCAP development.
- Investigate and determine GHG modeling capacity & tools.
- Conduct GHG policy modeling for PCAP.
- Provide GHG Inventory support (preparation for CCAP).
- Support public engagement and meetings.
- Provide support for the development of the Status Report.

The **Project Quality Assurance Manager (QAM)**, Brittany Jensen, is responsible for quality assurance across the environmental information operations. The Project QAM has oversight authority for planning, documenting, coordinating, and assessing the effectiveness of the QAPP. The Project QAM will work within a separate workstream/division of labor, to ensure independence from the staff identifying and analyzing environmental data. This individual has the authority to access and to discuss quality-related issues with TWI and DOA senior management, outside of the direct supervisory chain, as necessary.

The specific responsibilities may include, but are not limited to:

- Maintain oversight over planning, documenting, and implementing the QA requirements of this QAPP.
- Provide independent review of environmental data and deliverables; provide feedback to staff for corrective actions.
- Ensure that process- and project-specific QA documents are developed; that required or recommended protocols are followed; that data are reduced, validated, and reported according to specific criteria; and that QC assessments are performed.

Research Lead (RL) roles will be undertaken by TWI's Research Scientists, as described below. TWI may provide additional personnel as determined by technical and scientific requirements.

- Research Scientist III, **Colleen McHugh**, will provide project management support, project coordination support, research expertise, along with internal/external cross team project management both inside/outside of the Water Institute. She will report directly to Allison DeJong, Principal Investigator.
- Research Leads **Nastaran Tebyanian & Patrick Kane** will assist in writing, designing, technical editing, and completing technical tasks within the Water Institute responsibilities as relevant to this plan and the CPRG workplan. These individuals will also report to Allison DeJong, Principal Investigator.

A9. PROJECT QUALITY ASSURANCE MANAGER INDEPENDENCE

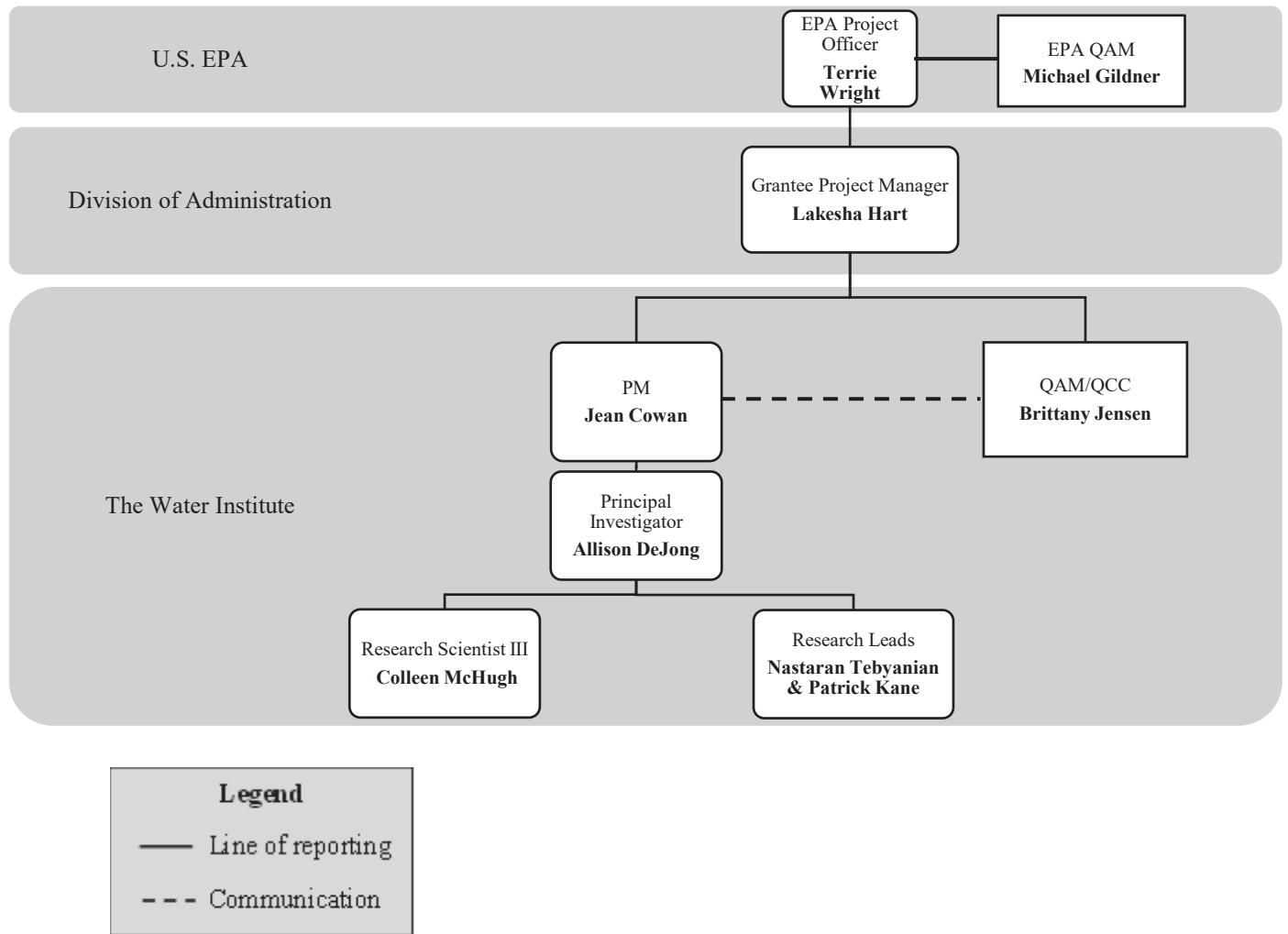
As mentioned in the previous section, the primary objectives for this project are to develop reliable inventories and analysis for each of the selected GHG-emitting sectors in Louisiana and to identify options for reducing emissions from those sectors. Accordingly, all quality objectives and criteria are aligned with these primary objectives. The quality system used for this project is the joint responsibility of the GPM and QAM, CPM, Task Leaders (Research Scientists).

As discussed in Section A.8, an organizationally independent QAM will maintain oversight of all required measures in this QAPP. QC functions will be carried out by technical staff (Research Leads) and will be carefully monitored by the responsible TLs, who will work with the QAM to identify and implement quality improvements.

A10. PROJECT ORGANIZATION CHART AND COMMUNICATIONS

Figure 1 below illustrates the organizational structure for the individuals carrying out environmental information operations.

Figure 1: Organizational Chart



A11. PERSONNEL TRAINING/CERTIFICATION

All OPB staff, including TWI staff, assigned to work on this project shall have appropriate technical and QA training to properly perform their assignments. Staff performing data review and analysis are professional scientists or have sufficient education/experience to perform emissions estimate calculations and work with computer models.

No additional special certifications are required to operate this CPRG project. TWI researchers, and OPB staff working on this project, may avail themselves of the many technical guides and manuals made available by EPA and other federal agencies.

The Contractor PM is responsible for tracking compliance and ensuring that all staff have the requisite training, knowledge, and education to serve on the project. Electronic training records will be maintained by TWI's Contractor PM and stored in OPB's SharePoint system. TWI or OPB may review and update these records in the event of staffing changes or upon renewal of trainings or certifications.

A12. DOCUMENTS AND RECORDS

The approved QAPP will be published on the DOA (OPB) website, which is a publicly accessible website, and OPB may conduct a webinar(s) on the plan contents for the project staff prior starting any task related to the use of environmental data. Any future amendment will follow the same procedure and any related material will be stored within the DOA intranet site. Similarly, to the QAPP distribution process, the CCAP will be published on a publicly accessible website, and the OPB may conduct a public webinar(s) on the plan contents.

Additionally, the OPB, with the assistance of TWI, will document in electronic form (and/or hard copy) QC activities for this project. The TL (and any additional relevant staff) is responsible for ensuring that copies of all completed QC forms, along with other QA records will be maintained in the project files. Project files will be retained by the OPB for 3 years after the submittal of the final project deliverable (Status Report, deliverable #3, due in Summer/Fall of 2027). The types of documentation that will be prepared for this project include:

- Planning documentation (e.g., QAPP)
- Implementation documentation (i.e., Review/Approval Forms and QA records)
- Assessment documentation (i.e., QA audit reports).

Detailed documentation of QC activities for a specific task or subtask will be maintained using the *QC Documentation Form* shown in *Appendix B: Example QC Documentation Form*. This form will document the completion of the QC techniques planned for use on this project as listed in the table in *Appendix A: Check Lists of Quality Control Activities for Deliverables*. One or more completed versions of these forms, as necessary, will be maintained in the project files. The types of documents for which QC will be conducted and documented may include raw data, data from other sources such as data bases or literature, field logs, sample preparation and analysis logs, instrument printouts, model input and output files, and results of calibration and QC checks.

Technical reviews will be used along with other technical assessments (i.e., QC checks) and QA audits to corroborate the scientific defensibility of any data analyses. A technical review (i.e., internal senior review) is a documented critical review of a specific technical work product. It is conducted by subject matter experts who are collectively equivalent (or senior) in technical expertise to those who performed the work. Given the nature of the deliverables under this project, a technical review is an in-depth assessment of the assumptions, calculations, extrapolations, alternative interpretations, and conclusions in technical work products. Technical review of proposed methods and associated data will be documented in *Appendix B: Example QC Documentation Form*. The form will include the reviewer's charge, comments, and corrective actions taken.

Additionally, the OPB has developed and instituted document control mechanisms for the review, revision, and distribution of QAPPs. Each QAPP has a signed approval form, title page, table of contents, and a document control format that conforms to EPA's [Environmental Information QAPP Standard](#). The distribution list for this QAPP was presented in *Table 3: QAPP Distribution List*. During the course of the project, any revision to the QAPP will be circulated to individuals on the distribution list, as well as to any additional staff supporting this project. Any revision to the QAPP will be documented in a QAPP addendum, approved by the same signatories to this QAPP, and circulated to all individuals on the distribution list.

At this time, it is unclear if the project will collect or handle personally identifiable information (PII) subject to the Privacy Act of 1974. However, if during the course of this project technical staff determine that PII is required to support project objectives, the OPB and its agents will meet all requirements of the Privacy Act of 1974.

GROUP B: IMPLEMENTING ENVIRONMENTAL INFORMATION OPERATIONS

This section of the QAPP describes the implementation of necessary QA and QC requirements and other technical activities to ensure that the results of the environmental information operations performed will satisfy the intended purpose, and the information/data quality objectives and performance/acceptance criteria in the Group A4 and A6 Elements.

B1. IDENTIFICATION OF PROJECT ENVIRONMENTAL INFORMATION OPERATIONS

In regard to task methodologies and tool selection, GHG emissions modeling performed for the Louisiana Climate Action Plan used a beta version, and then a public release version, of the Louisiana Energy Policy Simulator, a peer-reviewed and open-source tool developed by Energy Innovation LLC and RMI. TWI advised on this tool, worked with Energy Innovation to fine-tune it for the state, and supported its public release, including working with Louisiana State University (LSU) to ensure consistency with the 2021 Greenhouse Gas Inventory. While TWI expects to continue to use this tool to support Louisiana's CPRG grant, the Institute will scan widely for other available models, tools, and datasets that can support the quantification of emissions reductions, including the many tools developed by EPA. For instance, the GHG inventory may utilize the EPA's State Inventory Tool (SIT),⁶ state-level GHG inventories prepared by the EPA,⁷ and data reported to the EPA's Greenhouse Gas Reporting Program (GHGRP)⁸ together with any independent, sector-specific estimates prepared by the state. Any estimates will be compared to corresponding federal estimates for validation. Significant differences will be evaluated and discussed in the CPRG final report with the underlying data and methodology used for the independent state estimates.

The GHG inventory will consist of an updated version of the Louisiana 2021 Greenhouse Gas Inventory, prepared by the LSU Center for Energy Studies.⁹ TWI will update this inventory consistent with the methodology used by LSU, which in turn used EPA's State Inventory Tool supplemented by additional sources.

TWI anticipates using a wide variety of tools, models, datasets, and quantification techniques for assessing the emissions impacts of the proposed PCAP and CCAP policy priorities.

For both the PCAP and CCAP, TWI will support the development of analyses of community benefits and workforce opportunities. These may be done in-house by The Water Institute researchers or may be procured separately.

CRITERIA FOR OPTIONS IDENTIFICATION IN PLANNING PHASE

TWI will provide analyses of emissions reductions independently to the prioritization of policies, or options for emissions reductions. The State of Louisiana will derive its priorities from the existing Climate Action Plan, stakeholder and community input, and other relevant CPRG program guidance. TWI's analyses from the existing

⁶ <https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool>

⁷ <https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals>

⁸ <https://www.epa.gov/ghgreporting/data-sets>

⁹ https://www.lsu.edu/ces/publications/2021/louisiana-2021-greehouse-gas-inventory-df-rev_reduced.pdf

Climate Action Plan lay out a net zero pathway for the state and identified three policy pillars for achieving maximum GHG emissions reductions. To support the PCAP development, TWI will conduct top-down and bottom-up quantifications, as feasible, for each policy priority derived from the CAP and from stakeholder and community input. It is anticipated these analyses will include the following:

1. Quantity of emission reductions
2. Quantity of criteria and toxic pollutant reductions
3. Economic and labor benefits
4. Reductions in pollutant burden in environmental justice communities
5. Broader community benefits expected to accrue

B2. METHODS FOR ENVIRONMENTAL INFORMATION ACQUISITION

All environmental information operations conducted on this project will involve existing, non-direct measurement data. All existing data received will be reviewed by a senior technical staff member to assess data quality and completeness before their use. Consistent with the EPA's QA requirements, this QAPP describes the procedures that will be used to ensure the selection of appropriate data and information to support the goals and objectives of this project. Specific elements addressed by this QAPP include:

- Identifying the sources of existing data
- Presenting the hierarchy for data selection
- Describing the review process and data quality criteria
- Discussing quality checks and procedures should errors be identified
- Explaining how data will be managed, analyzed, and interpreted

Data presented in the GHG inventory and in any other deliverable will be traced to its source (e.g., database input and output). Key resources include data collected by the EPA (e.g., GHGRP data), and data from EPA-approved data sources (e.g., EIA Form 923 data). These sources may include primary literature (i.e., peer-reviewed journal articles and reports) or databases. TWI may also use approved existing sources (e.g., handbooks, databases). Original sources for all information and data contained in the document will be included in a list of references with appropriate citations. When peer-reviewed literature or EPA-approved data sources cannot be used, TWI will document any significant limitations to the data sources used.

The TWI will document information regarding each dataset and our rationale/selection criteria for selecting the data sources used in the inventory. The TL will be responsible for overseeing and confirming the selection of the data for the project tasks. See Section D2. Usability Determination for further information on data usability.

CRITERIA FOR ACCEPTING EXISTING DATA FOR INTENDED USE

TWI will rely on existing data from EPA and other federal agencies for completion of the identified tasks. Where supplemental data are required, TWI, following the secondary data quality ranking hierarchy (presented in *Table 4: Existing Data Quality Ranking Hierarchy* in Section D2), will review state agency data, peer-reviewed literature,

and, where appropriate, internal research. All uses of non-federal data will be reviewed by TWI senior scientists, in coordination with OPB PM, and strictly following this QAPP.

Regarding the criteria for determining whether the data are acceptable, it is expected that the process will be based on a comparison of the associated emissions estimate to the emissions estimate produced using the EPA's SIT. While some differences between the state's calculations and SIT calculations are expected, differences of more than 10% must be accompanied by an explanation subject to approval by the EPA prior to using the state's estimate in lieu of the SIT estimate.

IDENTIFICATION OF DATA SOURCES

TWI, in coordination with the OPB, will continuously search for new and updated data sets to complete the tasks in this QAPP. This may include all data, models, tools, and other sources of information detailed in Section ***Error! Reference source not found.***, as well as other state-level data that may be available or become available through the timeframe of the project. TWI may also identify data, methods, or sources of information from peer-reviewed literature, applied research undertaken directly by TWI or its partners, publicly available reports written by researchers, or academic research from partner institutions. Under the terms of its contract with the State of Louisiana, TWI may also procure additional subcontractors to support the identified tasks, which could include additional modeling, research, or data analysis. This QAPP will be revised if this comes to pass during the project timeframe.

For reference purposes, in addition to the data integrated into the EPA's SIT tool the following data sources may be used, following established data quality control requirements, as part of the analysis and reporting for the current CPRG project.

- Motor Vehicle Emissions Simulator (MOVES)
- Federal Highway Administration Annual Report of Highway Statistics – For use in estimating gasoline consumption, stage 2 breathing losses, miles traveled.
- State Gasoline Sales Tax Records – Tank Fill method, breathing losses. Census Bureau – Area inventories per capita emission factors.
- Dunn and Bradstreet Reports – Compilation of inventory sources, number of employees for factors, identification of area source categories.
- Toxic Release Inventory Data – Compilation of inventory sources.
- State and County Highway Department Records – Traffic paint usage values, lane miles painted.
- Aviation Fuel Usage Reports – Aircraft refueling.
- RCRA source lists – Identify all municipal waste landfills.
- US Forest Service document – Wildfire statistics, prescribed burning.
- Accidental Release Reports from other media at the state environmental agency.
- Labor Department – Employment statistics for emission factors.
- Federal Highway Administration Highway Performance Monitoring System Vehicular Miles Traveled Data

B3. INTEGRITY OF ENVIRONMENTAL INFORMATION

As indicated before, a wide range of data for a diverse set of GHG-emitting activities need to be used. Existing data resource may include sector-specific or facility-specific GHG emissions estimates, emissions factors, or activity data for use with emissions factors. The experimental design for this inventory project relies on the EPA's State Inventory Tool (SIT) together with independent estimates prepared by TWI, in coordination with LDEQ. The SIT allows for expedited estimates for many sectors with default entries included in the tool. Existing data resources from previously completed inventories will be utilized to develop GHG emissions estimates that are comparable to the SIT estimates. Subsequently to ensure the integrity of the environmental information, the SIT estimates for each sector will be compared to any independent state estimate utilized for the statewide inventory and TWI will document this review process according to the procedures established in sections A12, B7 and D1 of this QAPP.

B4. QUALITY CONTROL

Quality Control is the overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the monitoring project's data quality objectives. All environmental information operations in this project will follow the general guidelines outlined in this QAPP, as described below.

QUALITY CONTROL MEASURES

All environmental information operations conducted for this project will involve existing, non-direct measurement data. All data received will be reviewed by a senior technical staff member to assess data quality and completeness before their use. In addition to reviewing and assessing the data collected, all data entered into spreadsheets and all calculations completed for analyses will be reviewed by a senior technical reviewer. The reviewer will evaluate the approach to ensure the methods are appropriate and have been applied correctly to the analysis. The technical reviewer will also confirm all data were entered correctly and that calculations are complete and accurate. Calculations will be checked by repeating each calculation, independently, and comparing the results of the two calculations. Any data entry and calculation errors will be identified and corrected. Data tables prepared for the draft and final reports will be checked against the spreadsheets used to store the data and complete the analysis.

Where calculations are required to assess the data/datasets, mathematical/statistical calculations are performed using spreadsheets, or via software programs with predefined formulas and functions. TWI will ensure that any manipulations performed on the data/dataset were done correctly. Such calculations could involve statistical checks to look for data outliers. One approach, for example, that may be used to identify outliers or unusual data points is sorting a datasheet for one or more data variables. This approach is a simple but effective way to highlight unusually high or low values.

B5. INSTRUMENTS/EQUIPMENT CALIBRATION, TESTING, INSPECTION, AND MAINTENANCE

This Louisiana CPRG project does not involve the collection and analysis of samples nor the use of any laboratory equipment. Thus, this section *B5. Instruments/Equipment Calibration, Testing, Inspection, and Maintenance* is not applicable to this project. This blank section is provided to demonstrate adherence to EPA Standard, Directive # CIO 2105-S-02.0.

B6. INSPECTION/ACCEPTANCE OF SUPPLIES AND SERVICES

Section B6. Inspection/Acceptance of Supplies and Services is not applicable to this project. This blank section is provided to demonstrate adherence to EPA Standard, Directive # CIO 2105-S-02.0.

B7. ENVIRONMENTAL INFORMATION MANAGEMENT

The success of a monitoring project relies on data and their interpretation. For this project it will be critical that data be available to users and that these data are:

- Of known quality
- Reliable
- Aggregated in a manner consistent with their prime use
- Accessible to a variety of users

Quality Assurance/Quality Control (QA/QC) of data management will begin with the raw data and will end with a publicly available report. Data management encompasses and traces the path of the data from their source to their final use or storage. Data management also includes the control mechanism for detecting and correcting errors.

TWI, through its Project QAM, will be responsible for data management. The QAM will interface with the OPB GPM for quality assurance monitoring purposes. TWI employs a formal data management plan developed for internal project management by a professional data manager. In the data management plan, 'data', refers to all primary empirical and qualitative data, publications, samples, physical collections, software output, protocols, and new or modified model code. The plan prescribes general data management, quality assurance/quality control (QA/QC), and metadata creation requirements; all TWI projects must conform to these requirements.

The data management plan stipulates that upon initial QA/QC testing, all datasets are required to be supplemented with a prescribed metadata file. The data management plan will be fully executed before project close-out. The data management plan provides guidance for principal investigators (PIs) to maintain data quality and accessibility requires as stipulated by the funding institution or program. All activities performed under this project will conform to this QAPP. As TWI commences its scope of work, project staff will populate the Data Management Workbook, a QA/QC with specific data management protocols. An Excel file format of this document can be made available

to EPA upon request. Please refer to *Appendix D: Data Management Workbook Template* for a sample of the protocols established within the Data Management Workbook.

Data management files and project records will be stored by TWI on a secure computer or on a removable hard drive that can be secured following process outlined in section A12. For retention period for stored data refer also to section A12, Additionally, please refer to Section D1 for a discussion on *Verification and Validation Methods*.

GROUP C: ASSESSMENT AND OVERSIGHT

C1. ASSESSMENTS AND RESPONSE ACTIONS

All project staff working on tasks related to data management, like TWI staff, has read-only access to the LDEQ public website at [Emissions Inventory Public Data Sets | Louisiana Department of Environmental Quality](#). Consequently, assessments¹⁰ will be focused on data selection and data analysis. For this project, TWI will concurrently implement existing quality management systems that the OPB has previously utilized for submissions to the EPA under Title I of the Act where task-level deliverables will be subjected to required, regular reviews (e.g., quarterly) to ensure that technical, financial, and schedule requirements of this project are consistent with the EPA PO's and QAM's expectations.

As an overview of the QA program, it will include periodic review of data files and draft deliverables. The essential steps in the QA program are as follows:

1. Identify and define the problem
2. Assign responsibility for investigating the problem
3. Investigate and determine the cause of the problem
4. Assign and accept responsibility for implementing appropriate corrective actions
5. Establish the effectiveness of and implement the corrective action
6. Verify that the corrective action has eliminated the problem.

The TL will provide day-to-day oversight of the quality system. Periodic project file reviews will be carried out by the QC Coordinator, at least once per year to verify that required records, documentation, and technical review information are maintained in the files. The QAM will ensure that problems found during the review are brought to the attention of the Task Leader and are corrected immediately. All nonconforming data will be noted, and corrective measures to bring nonconforming data into conformance will be recorded.

The TLs and QAM are responsible for determining whether the quality system established for the project is appropriate and functioning in a manner that ensures the integrity of all work products. Technical staff will be tasked with performing the corrective action process. Corrective actions for errors found during QC checks will be determined by the TL and, if necessary, with the QAM. The originator of the work will make the corrections and will note on the QC form that the errors were corrected. A reviewer or TL, not involved in the creation of the work, will review the corrections to ensure the errors were corrected. Any problems noted during audits will be reviewed and corrected by the QAM and discussed with the TL as needed. Depending on the severity of the deficiency, the TL may consult the QAM and stop work until the cited deficiency is resolved. Deficiencies identified and their resolution will be documented in monthly project reports, if applicable.

¹⁰ **Assessment** is the evaluation process used to measure the performance or effectiveness of a system and its elements. Assessments may also be used as an investigative tool where problems may be suspected. (p. 21, EPA QAPP STANDARD, March 7, 2023).

The QAM and TL will comply and respond to all internal and EPA audits on the project, as needed. The QAM will produce a report outlining any corrective actions taken.

C2. OVERSIGHT AND REPORTS TO MANAGEMENT

The periodic progress reports (to the EPA PO) required in the grant agreement will be reviewed by the GPM and the CPM to ensure the project meets milestones and that the resources committed to the project are sufficient to meet project objectives. These periodic progress reports will describe the status of the project, accomplishments during the reporting period, activities planned for the next period, and any special problems or events including any QA/QC issues. Reports to the EPA will be drafted by the TL or other project staff familiar with project activities during the reporting period.

QC issues impacting the quality of a deliverable, the project budget, or schedule will be identified and promptly discussed with the assigned TL and the CPM or QAM as appropriate. Significant findings will be included in monthly reports with the methods used to resolve the specific QC issue or the recommendations for resolution for consideration by the EPA's PO or designee.

Based on the technical work completed during the reporting period, progress reports will be reviewed internally by an independent, qualified technical person (equivalent or senior to the TL), prior to submitting to the GPM. The CPM will conduct a final review of the report before transmitting the progress report to the EPA PO, and the GPM's manager will be included on correspondence including progress reports.

GROUP D: ENVIRONMENTAL INFORMATION REVIEW AND USABILITY DETERMINATION

D1. ENVIRONMENTAL INFORMATION REVIEW

Work conducted under this project will be subject to technical and editorial review. When existing data for the same GHG-emitting activity are available from multiple sources, the background information documents will be reviewed for all sources to determine the dataset that is the most representative of operations in the state. Additionally, the inventory report will include the vintage of the existing data resource and preference will be given to the most recent dataset that is representative of similar GHG-emitting activities in the state. Reviews will be conducted by an independent, qualified person—or a person not directly involved in the production of the deliverable.

The term “validation” refers to whether the data meet the QAPP-defined user requirements while the term “verification” refers to whether conclusions can be correctly drawn from the data. The quality of data used and generated for the project will be reviewed and verified at multiple levels by the project team. This review will be conducted by a senior technical reviewer from TWI with specific, applicable expertise. Both original and modified data files will be reviewed for input, handling, and calculation errors. Additionally, units of measure will be checked for consistency. Potential issues identified through this review process will be evaluated and, if necessary, data will be corrected, and analysis will be revised as necessary, using corrected data.

These corrections will be documented in project records. These measures of data quality will be used to judge whether the data are acceptable for their intended use. In cases where available data do not or may not meet data quality acceptance criteria, the TL will document these findings in the inventory along with corrective actions or use of alternative data sources.

VERIFICATION AND VALIDATION METHODS

As a standard operating procedure, all data (retrieved and/or generated) in this project will be verified and validated through a review of data files by an independent, qualified technical staff member (i.e., someone other than the document originator), and ultimately, the TL. A checklist of QC activities for deliverables under this project is provided as *Appendix A: Check Lists of Quality Control Activities for Deliverables*. Forms for documenting QC activities and review of deliverables are included in *Appendix B: Example QC Documentation Form*. Documentation of calculations will be included in spreadsheet work products and in supporting memoranda, as appropriate.

The TL is responsible for day-to-day technical activities of tasks, including planning, data gathering, documentation, reporting, and controlling technical and financial resources. The TL is the primary person responsible for quality of work on tasks under this project and will approve all-related plans and reports. These reports will be transmitted by the TL to the QAM for final review and approval.

Source data will be verified and validated through a review of data files by the technical staff, and ultimately the TL. Reviews of analyses will include a thorough evaluation of content and calculated values. All original and modified data files will be reviewed for input, handling, and calculation errors. Additionally, all measurement units will be checked for consistency. Any potential issues identified through this review process will be evaluated, errors corrected, and analysis repeated using the corrected data. All corrections will be documented in project records.

Source data will be verified and validated through a review of data files by the technical staff, and ultimately the TL. Typical data verification reviews can include checks of the following:

- Data sources are clearly documented
- Calculations are appropriately documented
- All relevant assumptions are clearly documented
- Conclusions are relevant and supported by results
- Text is well-written and easy to understand

The documented review process will be stored with deliverables for the project. For the narrative describing the methodologies used for the inventory, comments on drafts will be clearly and concisely summarized including a description of how substantive issues raised by commenters were resolved.

QC objectives include verification that data in database tables are stored and transferred correctly, algorithms call data correctly, units are internally consistent, and reports pull the required data. These data management issues will be addressed as part of the QC checks of data acquisition and document preparation.

For this project, it is not anticipated that any special data validation software will be required. However, where calculations are required to assess the data/datasets, calculations will be performed using computer spreadsheets (like Excel spreadsheets with predefined functions, or formulas) and calculators to reduce typographical or translation errors. General software available through the Microsoft Suite including Excel, PowerPoint, Access, and Word will be sufficient to perform the work as described in *Section A5. Project Task Description*.

RECONCILIATION WITH USER REQUIREMENTS

All data (retrieved and generated) and deliverables in this project will be analyzed and reconciled with project data quality requirements. To ensure deliverables meet user requirements, the TL or senior technical lead will review data and deliverables throughout the project to ensure that the data, methodologies, and tools used meet data quality objectives, are clearly conveyed, and represent sound and established science.

The OPB, in coordination with the TWI, will review each project with the EPA at the planning stage to ensure the approach is fundamentally sound and will meet the project objectives. The TL or senior technical lead will evaluate data continuously during the life term of the project to ensure they are of sufficient quality and quantity to meet the project goals. Prior to submission of draft and final products, the TL or senior technical lead will make a final assessment to determine whether the objectives have been fulfilled in a technically sound manner. Assumptions made in preparing project analyses will be clearly specified in related work products.

D2. USABILITY DETERMINATION

Determining useability of the environmental information is the culmination of the entire QA process for the project and involves a retrospective evaluation of the planning process. Not all environmental information may be useable for its intended purpose. The useability of the environmental information is performed at the conclusion of the environmental information operations using the outputs of the environmental information/data verification, the environmental information/data validation, and the environmental information/data quality assessment activities.

This reconciliation phase involves a qualitative and quantitative evaluation of environmental information to determine if the project information is of the right type, quality, and quantity to support its intended use and are suitable for the decisions that will be made. *Table 4: Existing Data Quality Ranking Hierarchy* presents an example hierarchy for data quality when identifying and reviewing available sources of data and information. When evaluating data resources, efforts will be made to identify and select data sources that most closely conform to the highest ranked criteria.

Data quality metrics and documentation may not be provided by each source, and as necessary, TWI may consult with subject matter experts from permitted facilities or trade associations operating in Louisiana to qualify data for use to meet project objectives.

Any available data quality information will be reviewed by TWI and project advisors to ensure that the data represent full-scale designs and commercial processes, and that they are applicable to economic and regulatory conditions in the United States. TWI will document data sources used and any significant limitations of utilized data or information to ensure that the data are appropriate for their intended use. An internal technical reviewer will

review the approach for selecting and compiling data; the review will include examination of the data sources and the intended use of the data. The specific QC techniques used will depend on the technical activity or analysis to which they are applied. The TL is responsible for verifying the usability of data and related information. Not all environmental information will ultimately be useable.

Table 4: Existing Data Quality Ranking Hierarchy

Quality Rank	Source Type
Highest	Federal, state, and local government agencies
Second	Consultant reports for state and local government agencies
Third	NGO studies; peer-reviewed journal articles; trade journal articles; conference proceedings
Fourth	Conference proceedings and other trade literature: non-peer-reviewed
Fifth	Individual estimates (e.g., via personal communication with vendors)

The OPB, in coordination with TWI, will work with EPA to ensure that all data used for the project are appropriate for their intended use. The main criteria that will be used in the selection of the data are the quality of the data (based on peer review, credible source, and/or QA documentation), availability, suitability for the intended purpose, and agreement with SIT estimates.

TWI will use the Secondary Data Quality Ranking Hierarchy when identifying and reviewing available sources of information. The source types in *Table 4: Existing Data Quality Ranking Hierarchy* appear in the order in which they are likely to meet data quality criteria. For example, federal government data are more likely to be from a credible source, thoroughly reviewed, suitable, available, and representative, and any exceptions to these data criteria are likely to be noted in the government data, providing transparency. Data from individuals are expected to be less reliable, not peer reviewed, and may not be suitable or representative.

If it is determined that data meeting the fourth (i.e., conference proceedings and other trade literature: non peer-reviewed) or fifth (i.e., individual estimates such as personal communications with vendors) level are from the best or only available data source, the TL will include in the inventory a description of these data with associated limitations for review by the EPA PO or delegate.

These measures of data quality will be used to judge whether the data are acceptable for their intended use. In cases where available data do not or may not meet data quality acceptance criteria, the TL will include in the inventory a discussion for review by the EPA PO or delegate explaining how emissions estimates that relied on such data compare to SIT estimates.

TWI will also consider, for example, the age (i.e., date of dataset) and the representativeness of the data and will include in the inventory report for review by the EPA of any quality concerns regarding data that are outdated or that have other quality issues, like data gaps or inconsistency with other sources. Any data source utilized that is older than 10 years will specifically be flagged in the inventory report.

Representativeness will be evaluated by determining that the emissions or activity data are descriptive of conditions in the United States, data are current, and data are descriptive of similar processes within Louisiana. Any incomplete datasets will be identified, and deficiencies will be evaluated to determine whether data are missing or confusing and if they meet the secondary-use quality objectives.

Key screening criteria will be used to screen the sources identified. The TL will provide oversight to the screening process to ensure sources collected are the most relevant and meet quality requirements. Available data and information from the selected sources will be compiled and relevant summary information will be extracted out of the information sources to develop the required output for each of the project tasks. If data is found to not be usable, the known or anticipated limitations on the use of the environmental information will be communicated in final reports, as needed.

REFERENCES

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- EPA, *State GHG Emissions and Removals*. Available at <https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals>. Accessed on 6/23/2023.
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- US DOT, *Highway Statistics Series* at <https://www.fhwa.dot.gov/policyinformation/statistics/2021/vm1.cfm>. Accessed on 7/26/2023.

APPENDICES

LIST OF APPENDICES

Appendix A: Check Lists of Quality Control Activities for Deliverables

Appendix B: Example QC Documentation Form

Appendix C: State of Louisiana Climate Pollution Reduction Grants Timeline

Appendix D: Data Management Workbook Template

APPENDIX A: CHECK LISTS OF QUALITY CONTROL ACTIVITIES FOR DELIVERABLES

Tasks and Deliverables	Quality Control Procedures																																																
Task 1. Transportation Sector GHG Inventory (Mobile Sources)																																																	
<p>Statewide tabular inventory of GHG emissions from mobile sources with narrative report describing data sources, methodology, and documentation of QAPP implementation.</p>	<ol style="list-style-type: none"> Comparison of (a) statewide inventory <i>versus</i> (b) statewide inventory developed using the EPA’s State Inventory Tool (SIT). For any values used in state inventory inconsistent with values calculated using the SIT, the table below will be utilized to assess precision and bias of the statewide inventory versus SIT estimates: <table border="1" data-bbox="695 730 1409 1312"> <thead> <tr> <th>Transportation Fuel</th> <th>State Estimate</th> <th>Federal Estimate</th> <th>Statistics*</th> </tr> </thead> <tbody> <tr><td>Aviation Gasoline</td><td></td><td></td><td></td></tr> <tr><td>Distillate Fuel</td><td></td><td></td><td></td></tr> <tr><td>Ethanol</td><td></td><td></td><td></td></tr> <tr><td>Jet Fuel, Kerosene</td><td></td><td></td><td></td></tr> <tr><td>Jet Fuel, Naphtha</td><td></td><td></td><td></td></tr> <tr><td>Hydrocarbon Gas Liquids</td><td></td><td></td><td></td></tr> <tr><td>Lubricants</td><td></td><td></td><td></td></tr> <tr><td>Motor Gasoline</td><td></td><td></td><td></td></tr> <tr><td>Natural Gas</td><td></td><td></td><td></td></tr> <tr><td>Residual Fuel</td><td></td><td></td><td></td></tr> <tr><td>Other</td><td></td><td></td><td></td></tr> </tbody> </table> <p>* Precision and bias calculations will be in accordance with the EPA’s Data Assessment Statistical Calculator (DASC) Tool available at https://www.epa.gov/sites/default/files/2020-10/dasc_11_3_17.xls with the state’s estimate taken as the measured value and the SIT value taken as the audit value.</p> Review by TL or senior technical reviewer—analytical methods and results are explained clearly, technical terms are defined, conclusions are reasonable based on information presented, and level of technical detail is appropriate. Editor review—writing is clear, free of grammatical and typographical errors. 	Transportation Fuel	State Estimate	Federal Estimate	Statistics*	Aviation Gasoline				Distillate Fuel				Ethanol				Jet Fuel, Kerosene				Jet Fuel, Naphtha				Hydrocarbon Gas Liquids				Lubricants				Motor Gasoline				Natural Gas				Residual Fuel				Other			
Transportation Fuel	State Estimate	Federal Estimate	Statistics*																																														
Aviation Gasoline																																																	
Distillate Fuel																																																	
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Lubricants																																																	
Motor Gasoline																																																	
Natural Gas																																																	
Residual Fuel																																																	
Other																																																	

Tasks and Deliverables	Quality Control Procedures
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Task 2. Electric Power Generation and Consumption

Statewide tabular inventory of GHG emissions from electric power generation with narrative report describing data sources, methodology, and documentation of QAPP implementation.

1. Comparison of (a) statewide inventory *versus* (b) statewide federal estimate developed by the EPA.
2. For any values in the state inventory that are significantly different from federal estimates, the table below will be utilized to assess precision and bias of the state’s estimate versus the federal estimate:

Electric Power Fuel	State Estimate	Federal Estimate	Statistics*
Coal			
Distillate Fuel			
Natural Gas			
Petroleum Coke			
Residual Fuel			
Wood			
Other			

* Precision and bias calculations will be in accordance with the EPA’s Data Assessment Statistical Calculator (DASC) Tool available at https://www.epa.gov/sites/default/files/2020-10/dasc_11_3_17.xls with the state’s estimate taken as the measured value and the SIT value taken as the audit value.

Ensure the GWPs used for the state estimate and the federal estimate are on the same basis. For example, the SIT tool uses AR5 GWP (e.g., methane GWP = 28).

3. Technical review of methods, calculations, and underlying datasets—data are appropriate for intended use, data are complete and representative and current, data sources documented, analytical methods are appropriate, and calculations are accurate.
4. Review by TL or senior technical reviewer—analytical methods and results are explained clearly, technical terms are defined, conclusions are reasonable based on information presented, and level of technical detail is appropriate)
5. Editor review—writing is clear, free of grammatical and typographical errors.

Tasks and Deliverables	Quality Control Procedures
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Task 3. Natural and Working Lands and Forestry

Statewide tabular inventory of GHG emissions and sinks from natural and working lands and forestry with narrative report describing data sources, methodology, and documentation of QAPP implementation.

1. Comparison of (a) statewide inventory *versus* (b) statewide inventory developed using the EPA’s State Inventory Tool (SIT).
2. For any values used in state inventory inconsistent with values calculated using the SIT, the table below will be utilized to assess precision and bias of the statewide inventory versus SIT estimates:

Natural and Working Lands and Forestry Component	State Estimate	SIT Estimate	Statistics*
Net Forest Carbon Flux			
Urban Trees			
Landfilled Yard Trimmings Food Scraps			
Forest Fires			
N ₂ O from Settlement Soils			
Agricultural Soil Carbon Flux			
Other			

* Precision and bias calculations will be in accordance with the EPA’s Data Assessment Statistical Calculator (DASC) Tool available at https://www.epa.gov/sites/default/files/2020-10/dasc_11_3_17.xls with the state’s estimate taken as the measured value and the SIT value taken as the audit value.

3. Technical review of methods, calculations, and underlying datasets—data are appropriate for intended use, data are complete and representative and current, data sources documented, analytical methods are appropriate, and calculations are accurate.
4. Review by TL or senior technical reviewer—analytical methods and results are explained clearly, technical terms are defined, conclusions are reasonable based on information presented, and level of technical detail is appropriate)
5. Editor review—writing is clear, free of grammatical and typographical errors.

Tasks and Deliverables	Quality Control Procedures
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Task 4. State Inventory of GHG Emissions from Other Major Sectors

Statewide tabular inventory of GHG emissions from the state’s major industrial, sources with narrative report describing data sources, methodology, and documentation of QAPP implementation.

1. Comparison of (a) statewide inventory *versus* (b) statewide inventory developed using the EPA’s State Inventory Tool (SIT).
2. For any values used in state inventory inconsistent with values calculated using the SIT, the table below will be utilized to assess precision and bias of the statewide inventory versus SIT estimates:

Fuels and Feedstocks for Other Major Sectors	State Estimate	SIT Estimate	Statistics*
Asphalt and Road Oil			
Aviation Gasoline Blending Components			
Coal			
Coking Coal			
Crude Oil			
Distillate Fuel			
Feedstocks, Naphtha less than 401 F			
Feedstocks, Other Oils greater than 401 F			
Hydrocarbon Gas Liquids			
Kerosene			
Lubricants			
Misc. Petro Products			
Motor Gasoline			
Motor Gasoline Blending Components			
Natural Gas			
Pentanes Plus			
Petroleum Coke			
Residual Fuel			
Special Naphthas			
Still Gas			
Unfinished Oils			
Waxes			
Wood			
Other			

* Precision and bias calculations will be in accordance with the EPA’s Data Assessment Statistical Calculator (DASC) Tool available at https://www.epa.gov/sites/default/files/2020-10/dasc_11_3_17.xls with the state’s estimate taken as the measured value and the SIT value taken as the audit value.

3. Technical review of methods, calculations, and underlying datasets—data are appropriate for intended use, data are complete and representative and current, data sources documented, analytical methods are appropriate, and calculations are accurate.
4. Review by TL or senior technical reviewer—analytical methods and results are explained clearly, technical terms are defined, conclusions are reasonable based on information presented, and level of detail appropriate.
5. Editor review: writing is clear, free of grammatical and typographical errors.

APPENDIX B: EXAMPLE QC DOCUMENTATION FORM

<Grantee Org.>														
Documentation of QA Review and Approval of Electronic Deliverables														
Approvals on this form verify that all technical and editorial reviews have been completed and the deliverable meets the criteria for scientific defensibility, technical, and editorial accuracy, and presentation clarity as outlined in the Quality Assurance (QA) Project Plan, QA Narrative, Quality Management Plan, and/or according to direction from the EPA PO.														
Client: EPA Region <X> Grant Number: <enter grant number> EPA Project Officer: <enter EPA PO> Project Number: <enter internal Project ID> Project Name: <enter internal project name> Grantee Org. Project Manager <enter grantee's project manager>														
QA Form Details														
Item Number	File Name (Copy the name of the File Reviewed)	Deliverable Description	Date Sent to Client	Deliverable (Draft) (Final)	Document Originator	(Review Type)	QA Review Information			QA Review Information				
							(Reviewer Name)	(Date Review was Performed)	(Brief Summary of Review Findings and Other Notes)	(Have all Findings Been Resolved)	(Originator Signature)	(Reviewer Signature)	(File Location) <i>Copy Long Folder Path Name</i>	
01				<input type="checkbox"/>		Technical				<input type="checkbox"/>	Yes			
02				<input type="checkbox"/>		Technical				<input type="checkbox"/>	Yes			
03				<input type="checkbox"/>		Technical				<input type="checkbox"/>	Yes			
04				<input type="checkbox"/>		Technical				<input type="checkbox"/>	Yes			

APPENDIX D: DATA MANAGEMENT WORKBOOK TEMPLATE

Metadata Element/Mamifest Field	Accepted Values (Length)	Universe	Purpose	Metadata Element/Mamifest Field Definition	Required (Y/N)
1. Dataset Derived For	Text String (255)	Resource	Used to track data lineage	The internal project code that the resource was originally developed for e.g P000123.	Y
2. Task	Text String (255)	Resource	Used to track data lineage	The internal project task code, e.g., 2.1.1, if no task breakdown please use N/A	Y
3. Dataset Name/Title	Text String (255)	Resource	Used for broad data management	Descriptive name of resource following The Water Institute file naming conventions.	Y
4. Dataset Summary	Text String (2048)	Resource	Used for broad data management	Narrative description of what the resource includes.	Y
5. Input To	Text String (255)	Resource	Used to document the lineage of dependent resources	For all resources. Entered as the Dataset Name/Title of the dependent resource.	Y
6. Originator (Internal or External)	Text String (8)	Resource	Used to define whether a collected dataset was created by The Water Institute or by an outside organization	<i>Internal:</i> The resource was created by The Water Institute (e.g., data collected by staff in the field).	Y
				<i>External:</i> The resource was created by an outside organization (e.g., CRMS data, NOAA tornado tracks).	
7. Collected, or Derived	Text String (9)	Resource	First step in determining archival/preservation requirements	<i>Collected:</i> Raw or processed data that has not been fundamentally altered during the course of the current project (e.g., a subsetted portion of a larger dataset - meaning you could put it back into the original dataset without changing the original meaning of the dataset).	Y
				<i>Derived:</i> Dataset is the result of processing/analysis (including clipping/re-sampling). If the modified dataset cannot be integrated into the original dataset without changing its meaning, it should be considered <i>Derived</i> .	

Metadata Element/Manifest Field	Accepted Values (Length)	Universe	Purpose	Metadata Element/Manifest Field Definition	Required (Y/N)
8. Intermediate, or Final	Text String (11)	Modifiers of <i>Derived</i> (see Element 6)	Second step in determining archival/preservation requirements	<i>Intermediate</i> : A derived dataset used for further processing (e.g., a derived dataset used as an input into another analysis). <i>Final</i> : A derived dataset that constitutes part of a final deliverable. Datasets tagged as Final are automatically considered Authoritative, will be retained in the data archive, and will require metadata.	Y
9. Authoritative (T/F)	Boolean (1)	Modifiers of <i>Intermediate</i> , <i>Final</i> (see Element 7)	Final step in determining archival/preservation requirements	<i>True</i> : An intermediate dataset constitutes part of a final deliverable AND/OR is of high intrinsic value to The Water Institute (e.g., took 40 hours to create) - this dataset is tagged as <i>Authoritative</i> and is retained. <i>False</i> : Dataset will not be retained.	Y
10. Dataset Retained for Metadata Creation (T/F)	Boolean (1)	Resource	Summary step for final review	<i>True</i> : Dataset will advance to metadata creation and will ultimately be retained in The Water Institute data archive. (Note: If authoritative, metadata should be created for the dataset) <i>False</i> : Dataset will not be retained.	Y
11. Modeled Dataset (T/F)	Boolean (1)	Resource	Used to determine feature-level metadata requirements and repository endpoint	<i>True</i> : any resource that is the output of a modelling routine. <i>False</i> : Dataset is not an output of a modelling routine.	Y
12. Geospatial Dataset (T/F)	Boolean (1)	Resource	Used to determine feature-level metadata requirements and repository endpoint	<i>True</i> : Dataset contains geospatial information (latitude, longitude) or is a geospatially-enabled output of a modelling routine. <i>False</i> : Dataset contains geospatial information (latitude, longitude) or is a geospatially-enabled output of a modelling routine.	Y
13. Spatial Description	Text String (2048)	Modifier of <i>Modeled</i> , <i>Geospatial</i>	Used to track the spatial domain of the data resource at a general/high level	A narrative description of the spatial domain of the resource or a grouping of key words describing the spatial domain (e.g. Resource includes the northern Gulf of Mexico coastal zone, spanning the Gulf of Mexico states of Texas, Louisiana, Mississippi, Alabama, and Florida. OR Gulf of Mexico; U.S. Coastal Zone, U.S. Gulf States; Texas; Louisiana; Mississippi; Alabama; Florida.	Y

Metadata Element/Manifest Field	Accepted Values (Length)	Universe	Purpose	Metadata Element/Manifest Field Definition	Required (Y/N)
14. Bounding Box	GeoJSON-formatted String (255)	Modifier of <i>Spatial Description</i>	Used to track resource spatiality	The coordinates detailing the vertices of the polygon that encompasses the resource, formatted as <code>geojson</code> in the WGS84 coordinate system (e.g. <code>"type": "Polygon", "coordinates": [[[[-89, 28], [-89, 32], [-92, 32], [-92, 28], [-89, 28]]]]</code>).	N
15. Format	Text String (15)	Resource	Used for broad data management	File format of resource (<code>tiff</code> , <code>ascii</code> , etc.).	Y
16. Estimated Volume	Text String (5)	Resource	Used for broad data management	Size of resource (<code>nnMB</code> , <code>nnGB</code> , <code>nnTB</code> , etc.).	Y
17. Source DOI	Text String (4096)	Resource	Used for broad data management	The DOI of the resource, if assigned.	Y
18. Current Storage Location	Text String (4096)	Resource	Used to track data Lineage	Location of the resource on our shared storage resources (Gulf, Delta, SharePoint).	Y
19. Restrictions	Text String (2048)	Resource	Used for broad data management, data sensitivity	Narrative description of any security or distribution limitations associated with the resource.	Y
20. Public Access (True/False)	Boolean (1)	Resource	Used for broad data management, data sensitivity	Details whether the resource is destined to be made public.	N
21. Resource Point of Contact	Text String (255)	Resource	Used for broad data management	Name and email address of the individual responsible for generating or maintaining the resource.	Y
22. Project Report/Document Reference	Text String (255)	Resource	Used for to track lineage	A reference to where the dataset is presented in a deliverable. Provide report number if available, report title otherwise.	Y