EPA's Climate Pollution Reduction Grants Quality Assurance Project Plans (QAPP)

July 27, 2023

Housekeeping Notes:

- Mics are automatically muted for all registrants and all cameras should be turned off.
- Links to additional resources will be provided in the Chat during the training.
- Please enter all questions in the chat box and "like" any questions already asked that you would also like answered. Questions will be answered during the Q&A session (*Reserved for Grantees*).

  - *Note: We can not answer any questions regarding the implementation grants at this time.*

- We encourage you to answer the poll questions which will pop-up periodically throughout the training and will also show up in the chat box (*Reserved for Grantees*).

- Slides and links to additional resources will be shared after the training

- A recording and Q&A document will be posted to the CPRG website after the training.

Disclaimer

The information contained in this presentation is intended for the sole purpose of providing tools and technical assistance to planning grant recipients under EPA's Climate Pollution Reduction Grants program. Specific questions on how this information relates to a particular grantee's deliverables should be directed to that grantee's EPA Project Officer.

Nothing contained in this presentation should be construed as creating new requirements beyond those already enumerated in the CPRG planning grant program guidance or the terms and conditions that apply to the grantee.

Agenda

- Intro to Quality Assurance
  - EPA QA Policy – Vicky Mei, US EPA
  - QA & CPRG – Andrea Denny, US EPA
- QAPP Template Overview – Stephen Boone, RTI
- Q & A

Intro to Quality Assurance

What is a QAPP?

Quality Assurance Project Plan (QAPP):

- Comprehensive document detailing project-specific QA, QC, and technical activities for the generation, collection, and use of environmental data or information

Why do I need a QAPP?

- 2 CFR § 1500.12: Law that requires EPA to have a quality program.
- CIO 2105.1: EPA's Environmental Information QA Policy

https://www.epa.gov/quality/agency-wide-quality-program-documents

Indicators a QAPP is needed:

- Gather
- Collect
- Generate
- Monitor
- Evaluate
- Use

- Quantify
- Compile
- Analyze
- Model
- Implement
- Measure

CPRG QA Terms and Conditions

- Authority: Quality Assurance applies to all assistance agreements involving environmental information as defined in [2 C.F.R. § 1500.12](#) Quality Assurance.

- The recipient shall ensure that subawards involving environmental information issued under this agreement include appropriate quality requirements for the work. The recipient shall ensure sub-award recipients develop and implement Quality Assurance (QA) planning document[s] in accordance with this term and condition; and/or ensure sub-award recipients implement all applicable approved QA planning documents.

QAPP Requirements

Quality Assurance Project Plan Standard, July 18, 2023

&EPA IT/IM DIRECTIVE STANDARD

Quality Assurance Project Plan Standard

Directive No: CIO 2105-S-02.0

Issued by the EPA Chief Information Officer,
Pursuant to Delegation 1-19

https://www.epa.gov/quality/agency-wide-quality-program-documents

QAPP Elements

- 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

Group A: Project Management and Information/Data Quality Objectives

Element	Description
A1	Title Page
A2	Approval Page
A3	Table of Contents, Document Format, and Document Control
A4	Project Purpose, Problem Definition, and Background
A5	Project Task Description
A6	Information/Data Quality Objectives and Performance/Acceptance Criteria
A7	Distribution List
A8	Project Organization
A9	Project QAM Independence
A10	Project Organizational Chart and Communications
A11	Personnel Training/Certification
A12	Documents and Records

EPA Support for QAPP Development

- Optional QAPP Templates will be available that are compliant with EPA's new QAPP Standard (issued July 2023)
  - Separate templates for States, MSAs, and Tribes/Territories
  - Templates provide the QAPP structure and include sample text (all sample text is illustrative and should be modified or replaced as needed)
- QAPP Technical Assistance
  - Limited Contractor Support will be available
  - Processes will vary by EPA Region; work through your Project Officer to access TA
- Expediting Review
  - Working with our regional QA staff to support/expedite review as much as possible

EPA's Climate Pollution Reduction Grants Quality Assurance Project Plan OPTIONAL Templates

Stephen Boone, PE (contractor)

Providing Technical Assistance for State, Tribal, and Local QAPP Templates

Baseline GHG Inventories & Sector-specific Options Listing

Center for Air Quality Engineering

RTI, International

QAPP Template Discussion - Two Parts

Part 1 – Overview / EPA Tools Referenced in Templates

Part 2 – Detailed Look at Key Sections of Template

QAPP Template Overview

Use of Template is Optional

Reflects Project with 2 Major Technical Elements :

Element 1:	**Multi-sector GHG Inventory for Grantee's Domain (Tribe, State, MSA, Locality).**
Element 2:	**GHG Reduction Options Quantified by Sector with Technical Reports.**

QAPP Template Overview – States

Element 1 - Multi-sector GHG Inventory Tasks

1. Transportation
2. Electricity Production / Consumption
3. Urban Forests (aka LULUCF)
4. Major Industrial Sources (GHGRP)
5. Minor Sources (Ag, Commercial, Residential …)

QAPP Template Overview – Tribal Nations

Element 1 - Multi-sector GHG Inventory Tasks

1. Transportation
2. Electricity Consumption
3. Urban Forests (aka LULUCF)
4. Other Sources (Ag, Solid Waste, Wastewater ...)

QAPP Template Overview – MSAs

Element 1 - Multi-sector GHG Inventory Tasks

1. **Transportation**
2. **Electricity Consumption**
3. **Urban Forests (aka LULUCF)**
4. **Solid Waste Landfills**
5. **Other Sources (Stationary Combustion, Ag, Solid Waste, Wastewater …)**

QAPP Template Overview – All Domains

Element 2 – QA / Criteria for Analyses, Listing, and Selection of Options for GHG Reductions, such as

1. Source Categories / Activities Affected
2. Estimated Reductions / Uncertainty
3. Criteria Pollutant Co-benefits
4. Toxic Air Pollutant Co-benefits
5. Benefits in Nonattainment Areas
6. Benefits in EJ Communities

QAPP Template Details - Existing Data

1. Project Management

- Title and Approval Sheet
- Table of Contents
- Distribution List
- Project/Task Organization
- Problem Definition/Background
- Project/Task Description
- Quality Objectives and Criteria
- Special Training/Certification
- Documents and Records

2. Data Generation / Acquisition

- Sampling Process Design
- Quality Control
- Non-direct Measurements
- Data Management

3. Assessment and Oversight

- Assessments and Response Actions
- Reports to Management

4. Data Validation and Usability

- Data Review, Verification, and Validation
- Verification and Validation Methods
- Reconciliation with User Requirements

https://www.epa.gov/irmpoli8/quality-assurance-project-plan-qapp-standard **July 18, 2023**

QAPP Template – Title / Approval Page

QAPP Short Title:	\<add short title\>
Section:	Title / Approval Page
Revision No:	\<0\> Date: MM/DD/YYYY
Page:	2 of 48

1. **Project Management (Group A)**
1.1. **Title and Approval Page**

Quality Assurance Project Plan for
\<add long title of project here line 1\>
\<add long title of project here line 2\>

Prepared by:
\<add name of grant applicant, line 1\>
\<add name of grant applicant, line 2\>
\<add street address, line 1\>
\<add street address, line 2\>
\<add city, county, state, zip code\>

Prepared for:
US EPA Region \<add EPA Region Number\>
\<add EPA regional office street address, line 1\>
\<add EPA regional office street address, line 2\>
\<add EPA RO city, state, and zip code\>

\<add date of submission\>

Template Instructions

On the Title and Approval Sheet, include the title of the plan, the name of the organization(s) implementing the project, the effective date of the plan, and the names, titles, signatures, and approval dates of appropriate approving officials. Approving officials may include Organization's Project Manager; Organization's QA Manager; EPA Project Manager; EPA QA Manager; Others, as needed (e.g., field operations manager, laboratory managers, State and Federal agency officials).

An example title for states to consider is "Quality Assurance Project Plan for Environmental Information Submitted to State Policymakers in the GHG Inventory and Options Identification Phase of the CPRG Program."

QAPP Template – Project Organization

Exhibit 1. Project Organization[3]

Legend
— Line of reporting
- - - Communication
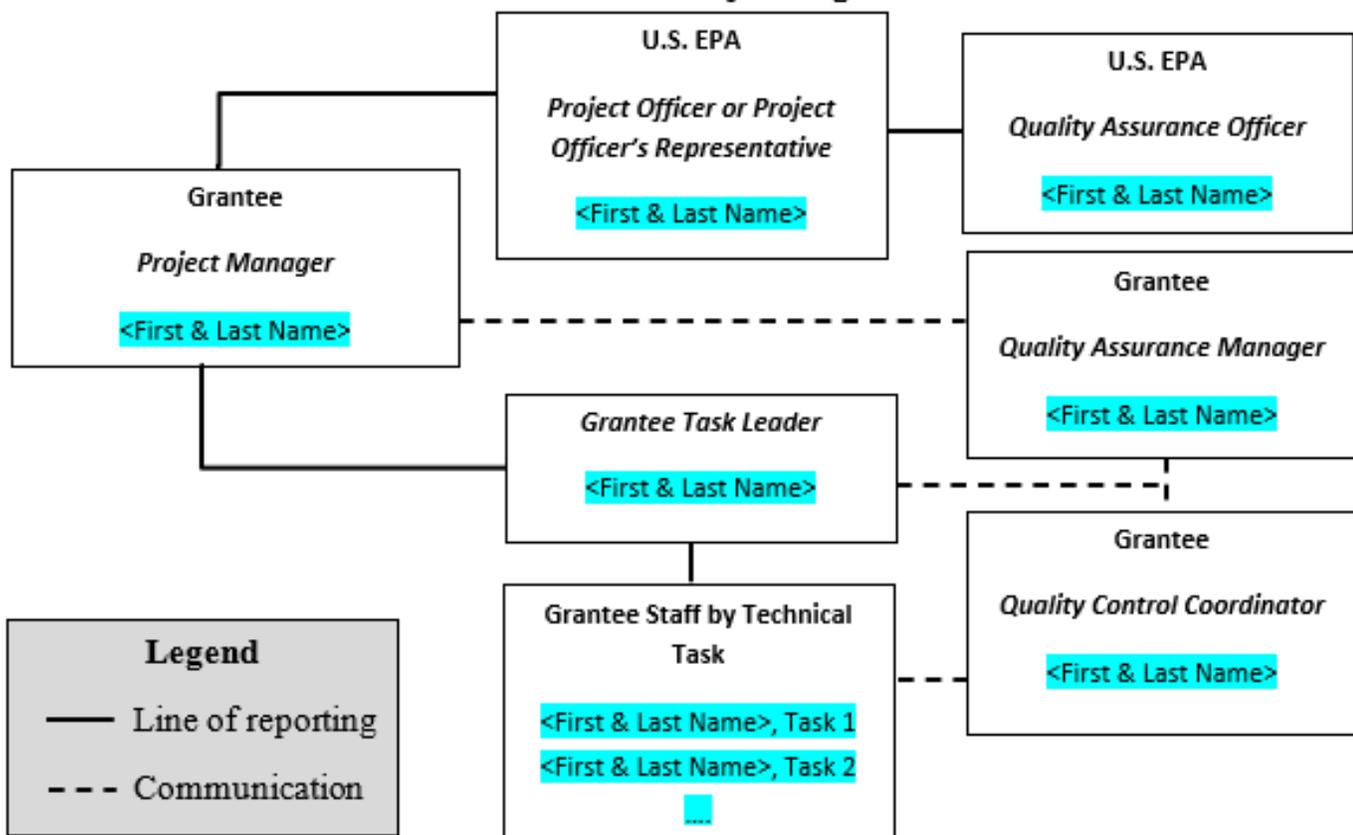
[3] Under CIO 2105-S-02.0, section 3, the organization chart must also identify any contractor relationships relevant to environmental information operations.

Template Instructions

Identify the individuals or organizations participating in the project and discuss their specific roles and responsibilities. Include the principal data users, the decision makers, the project QA manager, and all persons responsible for implementation. The project quality assurance manager must be independent of the unit generating the data. (This does not include being independent of senior officials, such as corporate managers or agency administrators, who are nominally, but not functionally, involved in data generation, data use, or decision making.) Identify the individual responsible for maintaining the official, approved QA Project Plan. Provide a concise organization chart showing the relationships and the lines of communication among all project participants. Include other data users who are outside of the organization generating the data, but for whom the data are nevertheless intended. The organization chart must also identify any subcontractor relationships relevant to environmental data operations, including laboratories providing analytical services.

Users may modify the provided sample text or replace with their own text.

July 15, 2023, 12:25 PM

@mention or reply

QAPP Template – Problem Background

1.5.4. **Reason for Project**

The baseline GHG inventory and options analyses developed under this project will be utilized by <Grantee Org.> and <State Air Program Oversight Authority> for planning purposes to support <State>'s development of the following three deliverables under the CPRG Program:

- <State>'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.

- <State>'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 or sinks, and include both near- and long-term GHG emission reduction goals and strategies.

- <State>'s **Status Report** on progress towards goal which is due in 2027 (not applicable to tribes or territories). This progress report will include updated analyses, plans, and next steps for key metrics.

QAPP Template – Problem Definition

1.5. Problem Definition / Background

Under this project, <Grantee Org.> will identify, evaluate, and utilize existing data resources[4] to develop a statewide inventory of the major sources of greenhouse gas (GHG) emissions within <State> and use that inventory data to develop a climate action plan. This QAPP focuses on the handling of environmental information under sector-specific tasks by technical staff charged with completing the following subtasks in a future planning project implemented in accordance with this QAPP:

1. Develop a comprehensive GHG inventory for the largest sources within each sector,
2. Develop options for reducing emissions within each sector,
3. Develop estimates or ranges of estimates for the reductions achievable under each option.
4. Develop uncertainty analyses for the emissions reduction estimate(s) or ranges under each option, and
5. Present the inventory, options listing, and associated analyses in a technical report for consideration by State policymakers with the authority to approve the deliverables under the CPRG planning grants.

The GHG inventory may utilize the EPA's State Inventory Tool (SIT),[5] state-level GHG inventories prepared by the EPA,[6] and data reported to the EPA's Greenhouse Gas Reporting Program (GHGRP)[7] together with any independent, sector-specific estimates prepared by the state. Any state estimates will be compared to corresponding federal estimates for validation. Significant differences will be evaluated and discussed in the inventory report with the underlying data and methodology used for the independent state estimates. The statewide inventory will include the following sectors and gases:

Sectors

1. Transportation
2. Electricity generation and/or use
3. Natural and working lands
4. Industry
5. Agriculture
6. Commercial and residential buildings
7. Waste and Materials Management
8. Wastewater

Greenhouse Gases (across all sectors)

carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), fluorinated gases (F-gases) including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3)

Template Instructions

State the specific problem to be solved, decisions to be made, or outcome to be achieved. Include sufficient background information to provide a historical, scientific, and regulatory perspective for this particular project.

Users may modify the provided sample text or replace with their own text.

Under the Inflation Reduction Act, Congress provided many tools to pursue GHG reductions including the CPRG program. Under these Congressional authorities, the EPA seeks* to achieve three broad objectives:

1. Reduce climate pollution while supporting creation of good jobs and lowering energy costs for families.

2. Accelerate work addressing environmental injustice and empower community driven solutions in overburdened neighborhoods.

3. Deliver cleaner air by reducing harmful air pollution in places where people live, work, play, and go to school.

*CPRG Program Guidance.

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QAPP Template – Problem Definition

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Under this project, \<Grantee Org.\> will identify, evaluate, and utilize existing data resources[4] to develop a statewide inventory of the major sources of greenhouse gas (GHG) emissions within \<State\> and use that inventory data to develop a climate action plan. This QAPP focuses on the handling of environmental information under sector-specific tasks by technical staff charged with completing the following subtasks in a future planning project implemented in accordance with this QAPP:

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4. Industry
5. Agriculture
6. Commercial and residential buildings
7. Waste and Materials Management
8. Wastewater

perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3)

QAPP Template – Problem Definition

Table 1.2 Rationale for Sector Selection

Sectors Included in Inventory	Rationale for Including in GHG Inventory
Transportation	Transportation activities were the largest source (29 percent) of total U.S. greenhouse gas emissions in 2021. From 1990 to 2021, transportation CO_2 emissions from fossil fuel combustion increased by 19 percent. Transportation activities occur across all states.
Electric power generation	The electric power sector accounted for 25 percent of total U.S. greenhouse gas emissions in 2021. Power generation and/or consumption occurs across all states.
Industry	The industrial sector accounted for 24 percent of U.S. greenhouse gas emissions in 2021. Since 1990, industrial sector emissions have declined by 11 percent. In 2021, total energy use in the industrial sector increased by 2 percent due to an increase in total industrial production and manufacturing output. EPA's GHGRP data provide additional insights into underlying trends in the industrial sector.
Natural and working lands[8]	Natural and working lands include fluxes of carbon from activities such as converting forests to agricultural use and practices that remove CO_2 from the atmosphere and store it in long-term carbon sinks like forests. In 2021, the net CO_2 removed from the atmosphere by natural and working lands was 12% of total U.S. greenhouse gas emissions. Between 1990 and 2021, total carbon sequestration in this sector decreased by 14%, primarily due to a decrease in the rate of net carbon accumulation in forests, as well as an increase in CO_2 emissions from urbanization.

TI Template Instructions

Describe approaches for organizing emissions data into sectors and/or the rationale for the sectors included in the State's inventory.

The State's approach may vary from the illustrative examples provided.

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QAPP Template – Problem Definition

1.5.2. Decisions to be Made

Existing EPA data sets and the SIT cover categories of GHG emissions by sector and by activity or segment (e.g., electric utility combustion of natural gas). The SIT provides many default values to facilitate developing statewide estimates that are consistent with the National Inventory of GHG Emissions.[9] 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 data sets, state inventories, or GHGRP publications)?
2. Determine the best options for reducing emissions of air pollution and achieving the following objectives[10] 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.

QAPP Template – Problem Definition

1.5.2.   Decisions to be Made

Existing EPA data sets and the SIT cover categories of GHG emissions by sector and by activity or segment (e.g., electric utility combustion of natural gas). The SIT provides many default values to facilitate developing statewide estimates that are consistent with the National Inventory of GHG

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following objectives[10] 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.

QAPP Template – Problem Definition

1.5.2. **Decisions to be Made**

Existing EPA data sets and the SIT cover categories of GHG emissions by sector and by activity or segment (e.g., electric utility combustion of natural gas). The SIT provides many default values to facilitate developing statewide estimates that are consistent with the National Inventory of GHG Emissions.[9] 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

2. Determine the best options for reducing emissions of air pollution and achieving the following objectives[10] 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.

QAPP Template – Problem Definition

1.5.2. Decisions to be Made

Existing EPA data sets and the SIT cover categories of GHG emissions by sector and by activity or segment (e.g., electric utility combustion of natural gas). The SIT provides many default values to facilitate developing statewide estimates that are consistent with the National Inventory of GHG Emissions.[9] 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 data sets, state inventories, or GHGRP publications)?

2. Determine the best options for reducing emissions of air pollution and achieving the following objectives[10] 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,

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.

QAPP Template – Task Descriptions

1.6. **Project / Task Description** for GHG Inventory and Options Identification

An example schedule of deliverables for the technical tasks (Tasks 1-5) for GHG inventory QAPPs is presented in **Tables 2.1** through **2.5**. The work to be performed under this project by <Grantee Org.> involves preparing a statewide GHG emissions inventory for <State>. The organization of the work is based on the use of the EPA's State Inventory Tool (SIT)[12] under the following sector-specific tasks

Task 1: State inventory of transportation-related GHG emissions.

Task 2: State inventory of electric power generation-related GHG emissions.

Task 3: State inventory of GHG emissions and sinks from natural working lands and forestry

Task 4: State inventory of GHG emissions from other major sectors.

Task 5: State inventory of GHG emissions from minor sectors.

For each sector-specific task, **Tables 2.1 – 2.5** provide planned activities and a schedule of deliverable for use by states preparing GHG inventories. The EPA's State Inventory Tool (SIT), other resources, and answers to frequently asked questions are also located on the State and Tribal Greenhouse Gas Data and Resources webpage.[13]

TI **Template Instructions**
Provide a summary of all work to be performed, products to be produced, and the schedule for implementation. Provide maps or tables that show or state the geographic locations of field tasks. This discussion need not be lengthy or overly detailed but should give an overall picture of how the project will resolve the problem or question described in section 1.5.

Users may modify the provided sample text or replace with their own text.

Please note, state approaches to organizing their data into sectors and/or the sectors included in their inventory may vary from the illustrative examples provided.

July 17, 2023, 8:57 PM

@mention or reply

Tasks Start with Federal Tool / Data

Table 2.1 Technical Task Descriptions, Task 1.

Tasks and Deliverables	Schedule
Task 1. Transportation Sector (Mobile Sources) *[Optional Example Approach]*	
1. Produce a profile of mobile source emissions using one of the following EPA resources (complete either option *a* or *b*): a. Download the EPA's state-level GHG data at https://www.epa.gov/system/files/other-files/2023-02/State-Level-GHG-data.zip. Use the EPA estimates as the baseline GHG inventory for the state. For example, use [State-GHG_Trends_Emissions_Sinks_Economic_Sector_01232023.xlsx] and enter your state abbreviation in cell D1 to prepare a GHG inventory consistent with the National Inventory, **or** b. Download the EPA's State Inventory and Projection Tool (SIT) at https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool. Use [co2ffc-module.xlsm] for CO_2 and the [Mobile Combustion module.xlsm] for CH_4 and N_2O from the transportation sector. Review the user's manual available using the "Consult User's Guide" on the [Control] sheet. This tool produces GHG estimates through 2020 for the state selected on row 3 of the [Control] sheet.	Within <X> days of QAPP approval by EPA or by federally authorized delegate.

Optional Methodology to Compare to Step 1 (federal estimate)

2. Obtain the most recent listing of registered motor vehicles from <State Division of Motor Vehicles> including year-manufactured, make, model, body style, fuel, county, description.

3. Download the national average vehicle miles traveled (VMT) and miles per gallon (MPG) by vehicle class from https://www.fhwa.dot.gov/policyinformation/statistics/2021/vm1.cfm. This file includes both 2020 and 2021 data.

4. For 2020, review SIT default entries for the statewide usage of "transportation motor gasoline" and for the statewide usage of "transportation distillate fuel" (reported in billion btu/year or Bbtu/yr) on the [Default State Energy Data Table] sheet.

   a. Based on the statewide population of vehicles from DMV, use the national average values for VMT and MPG for light-duty vehicles (and separately for heavy-duty vehicles) to estimate statewide usage of gasoline and distillate fuel (diesel) by light-duty and heavy-duty vehicles. Use the heating values and CO_2 emission factors for gasoline and distillate oil under 40 CFR Part 98

Example State Template Tasks

1.7. Quality Objectives / Criteria for GHG Inventory and Options Identification

The primary objectives for this project are to develop reliable inventories for each of the primary GHG-emitting sectors in <State> and to identify options for reducing emissions from those sectors. Accordingly, all quality objective and criteria are aligned with these primary objectives. The quality system used for this project is the joint responsibility of the <Grantee Org.> PM, Task Leaders, and QC Coordinator. As discussed in section 1.4, an organizationally independent QA Manager will maintain oversight of all required measures in this QAPP. QC functions will be carried out by technical staff and will be carefully monitored by the responsible Task Leaders, who will work with the QA Manager and QC Coordinator to identify and implement quality improvements. All activities performed under this project will conform to this QAPP.

1.7.1. Data Quality, Management, and Analyses (Inventory and Options Analyses)

For this project, <Grantee Org.> 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 the <State>'s PCAP and CCAP as discussed in section 1.5.4 of this QAPP. The table in **Appendix A** lists by task the specific QC techniques and criteria that are part of this QAPP.

Appendix A: QC Checklists

Appendix A: Check Lists of Quality Control Activities for Deliverables

Tasks and Deliverables	Quality Control Procedures
Task 1. Transportation Sector GHG Inventory (Mobile Sources)	
Statewide tabular inventory of GHG emissions from mobile 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:

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			

* 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. 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.

4. Editor review—writing is clear, free of grammatical and typographical errors.

Template Instructions

The optional example checklists in Appendix A are provided to support assessment of quality objectives defined in section 1.7 which requires use of a systematic planning process to define the quality objectives and performance criteria for the environmental data used in the baseline inventory.

In the future, while implementing the State's GHG inventory project, during the State's review of the draft GHG inventory estimates, checklists similar to these examples may be useful for comparing the State's draft estimates to published federal estimates or to estimates developed with the SIT tool and federal default inputs.

Some examples reference the EPA's SIT Tool and some examples reference the EPA's state-specific estimates derived from the National GHG Inventory. Either approach may be useful on any task, as selected by the State. Either approach would be consistent with the underlying QC principal that the State should consider: comparing draft GHG inventory estimates to an independently prepared estimate.

Please note, these comparisons do not need to be completed during QAPP development. This appendix only reflects example, blank, checklists as components of a systematic planning process for consideration by the States as they develop their QAPPs.

Example State Template QC Approach

QC Comparison of State and EPA Estimates

A	B	C	D
2020 Electric Power Fuel	Federal Estimate (MMT CO2e)	State Estimate (MMT CO2e)	Statistic
Coal	22.5	24.1*	Signed Bias +8.41%
Distillate Oil	0.312	→ 0.312	
Natural Gas	18.5	→ 18.5	
Pet. Coke	0.401	→ 0.401	Variance 8.57%
Residual Fuel	0.112	→ 0.112	
Wood	1.41	1.73*	
Other	0.0432	→ 0.0432	

* State developed independent estimate.
→ State used estimate from federal tool.

Example State Template References

References - The templates include a list of references, including EPA QA and QAPP guidance, as well as technical guidance on inventories. Here is a sample of the technical references from the State template:

- EPA Chief Information Officer's Policy Directive on Information Technology / Information Management available at EPA IT/IM Directive: Environmental Information Quality Policy, Directive # CIO 2105.3 ; <mark>**see definitions of QA terms in section 8.**</mark>

- *EPA Requirements for Quality Assurance Project Plans* available at https://www.epa.gov/quality/epa-qar-5-epa-requirements-quality-assurance-project-plans

- State Inventory Tool at https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool

- EPA state-level GHG data sets at https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals

- Data reported to EPA's Greenhouse Gas Reporting Program (GHGRP) at https://www.epa.gov/ghgreporting/data-sets

- EPA National Inventory at https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021

- State and Tribal GHG Resources at https://www.epa.gov/ghgemissions/state-and-tribal-greenhouse-gas-data-and-resources

- US DOT Federal Highway Administration at https://www.fhwa.dot.gov/policyinformation/statistics/2021/vm1.cfm

- EPA fuel heating values and CO_2 emission factors at eCFR :: 40 CFR Part 98 -- Mandatory Greenhouse Gas Reporting

- EIA Form 923 at https://www.eia.gov/electricity/data/eia923/

- Global warming potentials under https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-A?toc=1

- USDA Forest Service at https://www.fs.usda.gov/research/treesearch/62418

Upcoming CPRG Trainings

- **Aug 2, 1-3:30 PM ET:** EPA Programs, Tools, and Resources used for Evaluation and Quantification of GHG Reduction Measures

- **Week of Aug 7**: EPA Climate Action Funding Fair with USDA, DOE, HUD, DOI, DOT, and Treasury on IRA and other funding opportunities (five sessions on each of the key CPRG sectors and one session on tribal programs, each 90-120 minutes)

- **Aug 9, 2-3 PM ET**: Quantified GHG Reduction Measures

- **Aug 16, 2-3 PM ET:** Low Income/Disadvantaged Communities (LIDAC) Benefits Analysis

- **Aug 23, 2-3 PM ET:** Workforce Planning Analysis

- **Aug 30, 2-3 PM ET:** Meaningful Engagement - Update and Technical Resources

Q & A

- Please enter questions via the chat box

- Please keep questions on-topic

- We are not able to answer questions about the implementation grants at this time

Appendix

QAPP Template Overview

For Questions on QAPP Terminology:

[CIO 2105.3](#) (4/12/2023)
EPA's Environmental Info. Quality Policy
Section 8 – Definitions

[CIO 2105-S-02.0](#) (7/18/2023)
EPA's QA Project Plan Standard
Section 8 – Definitions

https://www.epa.gov/irmpoli8/quality-assurance-project-plan-qapp-standard

Referenced Tools – State

State GHG Inventory and Projection Tool (SIT)

- **Methods / Sectors Same as <u>U.S. GHG Inventory</u>**

- **Interactive Spreadsheet Model**

- **11 Estimation Modules for Top-down Approaches**

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

EPA Estimates for States Consistent with National Inventory

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

Tools – State Estimates by EPA

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

Sector/Source	1990		2005		2016	2017	2018	2019	2020
Transportation	**40.1**		**56.4**		**54.9**	**55.4**	**56.4**	**57.1**	**51.7**
CO$_2$ from Fossil Fuel Combustion	38.5		52.2		52.6	53.2	54.3	55.1	49.8
Substitution of Ozone Depleting Substances	NO		2.8		1.5	1.4	1.3	1.3	1.2
Mobile Combustion	1.3		1.2		0.6	0.5	0.5	0.5	0.4
Non-Energy Use of Fuels	0.3		0.2		0.3	0.3	0.3	0.3	0.2
Electric Power Industry	**48.2**		**76.8**		**52.1**	**48.4**	**49.2**	**46.9**	**37.8**
CO$_2$ from Fossil Fuel Combustion	46.9		75.4		51.1	47.5	48.3	46.0	37.1
Stationary Combustion	0.6		1.1		0.8	0.7	0.7	0.7	0.5
Incineration of Waste	0.0		0.0		NO	NO	NO	NO	NO
Electrical Transmission and Distribution	0.6		0.2		0.3	0.2	0.2	0.2	0.2
Other Process Uses of Carbonates	0.0		0.0		0.0	0.0	0.0	0.0	0.0
Industry	**20.8**		**18.0**		**13.3**	**13.3**	**13.7**	**13.9**	**13.5**
CO$_2$ from Fossil Fuel Combustion	15.7		12.4		8.3	8.2	8.5	8.6	8.2
Natural Gas Systems	1.2		1.0		1.0	1.0	1.0	1.1	1.1
Non-Energy Use of Fuels	0.6		0.6		0.5	0.5	0.6	0.5	0.5
Petroleum Systems	+		NO		NO	NO	NO	NO	NO
Coal Mining	NO		NO		NO	NO	NO	NO	NO
Iron and Steel Production	1.0		1.7		0.3	0.2	0.2	0.2	0.1
Cement Production	NO		NO		NO	NO	NO	NO	NO

Referenced Tools – Tribal Nations

Tribal GHG Inventory Tool (TGIT)

- Global Protocol - Community-Scale GHG Emissions

- Free Interactive Spreadsheet Model

- Includes Residential and Commercial Sectors

- Separate Module for Tribal Gov't Operations

https://www.epa.gov/statelocalenergy/tribal-greenhouse-gas-inventory-tool

Referenced Tools – MSAs

Local GHG Inventory Tool (LGGIT)

- **Global Protocol - Community-Scale GHG Emissions**

- **Free Interactive Spreadsheet Model**

- **Includes Residential and Commercial Sectors**

- **Separate Module for Local Gov't Operations**

https://www.epa.gov/statelocalenergy/local-greenhouse-gas-inventory-tool