CQ1: Science Needs Related to Air Toxic Sources and Emerging Contaminants

The following table lists anticipated Air, Climate, and Energy (ACE) deliverables relevant to Charge Question 1. The Outputs and Products may change as new scientific findings emerge. Completion of Outputs and Products is contingent on appropriate resources being available. ACE will continue to actively engage with EPA Partners to meet their needs and inform the reviews of the NAAQS and implementation strategies.

ID	Research Area, Output, or Product Title
Research Area 1: *Approaches to Support Air Quality Management for Multiple Pollutants at Multiple Scales*	
AE.1.5.6	Summary of Spatial Analysis of Volatile Organic Compounds in Rubbertown Area of Louisville, Kentucky using Passive Samplers
AE.1.6.10	Development of a VCP Emission Inventory Methodology and Tool
AE.1.6.2	Summary of Implications of VCPs for Ozone and PM in Urban Atmospheres (California and the Northeast US)
AE.1.6.4	Summary of Identification of VCP-driven Criteria Pollutant Exceedances Nationwide in the Context of Changing NOx
AE.1.6.5	Summary of Laboratory Determination of SOA and Ozone from Volatile Chemical Products (VCPs)
AE.1.6.8	Summary of a Multimodel Approach to Chemical Prioritization Based on Primary and Secondary Pollutant Exposure Across Environments Resulting from Volatile Chemical Products
Research Area 2*: Approaches for Characterizing Source Emissions, Air Quality, Exposure, and Mitigation Strategies*	
AE.2.1.3	Summary and dataset on emissions characterization of NOx, VOC, SVOC, PM emissions from both light and heavy-duty vehicles
AE.2.1.5	Summary of emissions from off-road stationary diesel gensets operating on traditional and alternative fuels
AE.2.1.6	The SPECIATE Database
AE.2.1.9	Summary of Investigation of Stationary Source Condensable PM Measurements
AE.2.2	**Output: Development, Evaluation, and Implementation of Updated Ambient Air Measurement Methods**
AE.2.3	**Output: Progress update on fugitive, area source, fenceline, and roadway emissions research**
AE.2.3.1	Summary of Emission Factors of Reduced Nitrogen and Sulfur Compounds from Biomass Combustion
AE.2.3.3	FY20 Annual Summary of NGEM and Fugitive, Area Source, and Fenceline Research
AE.2.3.4	FY21-22 Annual Summary of NGEM and Fugitive, Area Source, and Fenceline Research
AE.2.3.5	Dataset of PM Speciation Results of Brake and Tire Wear Collected from On-Road Motor Vehicles
AE.2.3.6	Summary of results of field evaluation of portable automated gas chromatographs for near source VOC monitoring
AE 2.5	**Output: Emission Estimating Methodologies (EEMs) and future research needs for emissions from agricultural sources**
AE.2.5.1	Draft Emission Estimating Methodologies (EEMs) for ammonia, hydrogen sulfide, and particulate matter emissions from swine, poultry (broiler and layer), and dairy farms
AE.2.6.1	Summary of Temporal Patterns and Biophysical Controls on Methane Emissions from Reservoirs
AE.2.6.2	An Estimate of Methane Emissions for U.S. Reservoirs for Inclusion in the Annual Inventory of U.S. Greenhouse Gas Emissions and Sinks
Research Area 4: *Public Health and Environmental Exposures and Responses to Emerging Air Pollutants and Sources*	
4.1	**Output: State-of-the Science: Synthesis of Research on Airborne PFAS Emissions, Sources, Measurement Methods, Control, Dispersion, Environmental Fate, and Impacts and Identification of Remaining Critical Knowledge Gaps**

ID	Research Area, Output, or Product Title
AE.4.1.1	PFAS Source Emissions Measurement Methods and Approaches
AE.4.1.10	Summary of Modeling PFAS Air Emissions, Chemistry, and Deposition
AE.4.1.11	Summary of Computational Study of the Atmospheric Lifetimes and Fate of Volatile Perfluoroalkyl Substances (PFAS)
AE.4.1.12	Summary of Characterization and Mitigation of PFAS Air Emissions from Fabric Thermal Application Processes
AE.4.1.13	PFAS Literature Review Paper - Air Sources and Pathways for Perfluorinated Compounds
AE.4.1.14	Modeling PFAS Air Fate and Transport in the Eastern U.S.
AE.4.1.15	Other Test Method (OTM)-45 for PFAS Compounds
AE.4.1.2	PFAS Source Emissions Measurement Methods - Summary of Field Evaluation and Validation
AE.4.1.3	Summary of PFAS Source Emission Characterization
AE.4.1.4	Ambient Air Measurement Approaches for PFAS Compounds
AE.4.1.5	Summary of Field Evaluations of Ambient Air Measurement Approaches for PFAS Compounds
AE.4.1.6	Summary of PFAS Ambient Air Characterization
AE.4.1.7	Atmospheric Deposition Measurement Approaches for PFAS Compounds
AE.4.1.8	Summary of Field Evaluations of Atmospheric Deposition Methods for PFAS Compounds
AE.4.1.9	Summary of PFAS Wet Deposition Characterization
AE.4.3	**Output: Ethylene Oxide - State of the Science and Methods Development**
AE.4.3.3	Summary of Field Evaluation of Current EPA Method TO-15A Analysis for Ambient Monitoring of Ethylene Oxide
AE.4.3.4	Toxic Organics Method TO-15A Supplement, Canister Analysis Method for Ethylene Oxide in Ambient Air
AE.4.3.5	Summary of EtO Emissions from Motor Vehicles
AE.4.3.7	Improved Characterization of Atmospheric Chemistry of EtO
AE.4.3.8	Summary of Instrumentation and Measurement Capabilities for Source Emissions of EtO
AE.4.3.9	Summary of Instrumentation and Measurement Capabilities for Background and Near-Source Emissions of EtO