Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Outer Continental Shelf Air Quality System (OCS AQS) (NT-20-04)
Administered by	Office of Environmental Programs
BOEM Contact(s)	Holli Wecht (holli.wecht@boem.gov)
Procurement Type(s)	Contract
Conducting Organization(s)	Parsons Corporation/Lakes Environmental
Total BOEM Cost	$1,119,605.81
Performance Period	FY 2019–2028
Final Report Due	September 2028
Date Revised	July 3, 2024
Problem	BOEM needs a web-based Air Quality Tool to assist in the management of BOEM's Air Program, which will collect facility activity data, compute and display emissions based on the activity data, and then perform modeling, all of which is required under the Outer Continental Shelf Lands Act, BOEM's air regulations at 30 CFR 550, and the National Environmental Policy Act.
Intervention	Two of BOEM's requirements under OCSLA and NEPA include monitoring of emissions per 30 CFR 550.303(k) and 550.304(g) and conducting air quality impact assessments. BOEM could develop an IT solution with different but integrated modules for emissions and modeling (plus have the capacity for additional capabilities such as advanced emissions solutions including publication of final inventory reports and plans and compliance modules).
Comparison	BOEM and operators do not have a reliable, quick, and easy emissions tool or a consistent approach to dispersion modeling. This tool would allow BOEM to perform required impact assessments using emissions and modeling.
Outcome	The predicted outcome would be a consistent approach through a quick and an easy-to-use web-based tool. Benefits of this tool would be increase productivity, minimizing errors through streamlined QA/QC, integrating legacy system into a single application, standardizing agency workflows and procedures, performing tasks quicker, reducing costs, forward compatibility for anticipated applications in offshore renewable energy development and carbon capture and storage, and consolidation of data.
Context	Gulf of Mexico and Alaska Regions

BOEM Information Need(s): BOEM needs a web-based Air Quality Tool to assist in the management of BOEM's Air Program, which will collect facility activity data, compute and display emissions based on the activity data, and model air data, all of which is required under the Outer Continental Shelf Lands Act (OCSLA), BOEM's air regulations at 30 CFR 550, and the National Environmental Policy Act (NEPA).

Background: Two of BOEM's requirements under OCSLA and NEPA include monitoring of emissions per 30 CFR 550.303(k) and 550.304(g) and conducting air quality impact assessments. BOEM could develop

an integrated IT solution with different but integrated modules, emissions and modeling (plus have the capacity for additional capabilities). The emissions module would allow operators to input and collect activity data, perform quality assurance, and calculate emissions. The modeling module would import emissions directly from the OCS AQS- Emissions module, would use the BOEM's 5-year meteorological dataset (2010-2014) from the Air Quality Modeling in the Gulf of Mexico Study (Wilson 2019) and the 5-year meteorological dataset (2009-2013) from the Arctic Air Quality Impact Assessment Modeling Study (Fields Simms 2018), along with the approved receptor grids and source information data, conduct regulatory AERMOD and/or CALPUFF modeling, exporting results in a table for plan package and/or GIS map. Lastly, additional capabilities could be implemented into this tool including advanced emissions solutions (publication of final inventory), ambient air monitoring, emergency release modeling, planning/permitting and compliance, etc.

Objectives: The purpose of the study is to develop a web-based air quality management tool for the Gulf of Mexico and Alaska Regions, plus identify (and build) further research and modules needed.

Methods: For this advanced capacity, the contractor will provide Post-Submission Inventory Support (QA/QC) of 2023 draft emissions data in OCS AQS including forensic level QA/QC of the 2023 emission inventory beyond the automated QA/QC to identify macro trends by comparing emission for various equipment types to identify outlier or other discrepancies. This includes conducting limited follow-up meetings/emails with the operators. For reference, previous QA/QC efforts for the 2017 inventory were performed by ERG (BOEM subcontractor) and included the following QA/QC checks: 1) pre-processing, 2) equipment survey consistency, 3) data range checks, 4) stream analysis between certain equipment types, 5) application of surrogate values and post processing of surrogate values, and 6) incorporation of draft inventory revisions. In addition, because the operators had a choice in fugitive approaches this year (old emissions factors/number of components approach versus new leak detection using IR camera approach), the Contractor shall perform a basic analysis comparing 2021 to 2023 fugitive emissions listing how many facilities (and which ones) used leak detection and resulting in a decrease or increase of fugitive emissions. The Contractor shall conduct QA/QC on the lease source data which included eWell incorporation, so conducting a basic analysis of 2021 to 2023 lease emissions. Lastly, the Contractor shall submit draft, proof, and final reports with report graphics, along with draft, proof, and final Technical Summaries.

Specific Research Question(s): This IT tool will assist BOEM in offshore air quality management including the calculation of emissions inventories and conducting modeling impact assessments.

Current Status: The existing BSEE IT project titled "Outer Continental Shelf Air Quality System (OCS AQS)", Contract No. 140E0119C00006, has developed a web-based tool including modules for Emissions and Modeling. OCS AQS has collected the final 2021 emissions data and has the necessary modeling files for CALPUFF and AERMOD integration. The final 2021 User Manual (Thé 2022) and the final 2021 emissions inventory report has been published (Thé 2023). Contractors have also coded the new features in the emissions module (leak detection approach and eWell imported lease data) for the 2023 effort. In addition, operators are required to collect 2023 calendar year emissions data using OCS AQS under BOEM NTL No. 2022-N01. Currently, the draft 2023 data has been collected in the OCS AQS tool, but now needs to be QA/QC and finalized before publication (this effort).

Publications Completed:

Thé C, Johnson M, Alkabbani H, Munshed M, Torrens A, Matthews B, Gomes A, Lim D, Thé J. 2023. OCS AQS: Outer Continental Shelf Air Quality System (OCS AQS): year 2021 emissions inventory

quality assurance/quality control (QA/QC) study. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 282 p. Report No.: OCS Study BOEM 2023-023.

Thé J, Thé C, Munshed M, Torrens A, Alkabbani H. 2022. Outer Continental Shelf Air Quality System (OCS AQS) operator user manual (version 1.9). Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 201 p. Report No.: OCS Study BOEM 2022-048.

Affiliated WWW Sites:

https://www.boem.gov/environment/environmental-studies/ocs-emissions-inventories

References:

Fields Simms P, Do B, Brashers B, Stoeckenius T, Morris R. 2018. Arctic air quality impact assessment modeling: final project report. Anchorage (AK): U.S. Department of Interior, Bureau of Ocean Energy Management. 58p. Report No.: OCS Study BOEM 2018-020.

Wilson D, Stoeckenius T, Brashers B, Do B. 2019. Air quality modeling in the Gulf of Mexico Region. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. Gulf of Mexico Region. 655 p. Report No.: OCS Study BOEM 2019-057.