EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-03

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-11-006	04/29/2011 To 03/28/2013 Base Option Period Number 1	Source Emissions Test Methods

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW: I

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 03/29/2012 To 03/28/2013

Comments:
This work assignment includes 50 hours for preparation of the work plan and to begin work on the work assignment. To the best of my knowledge, this work does not duplicate any work previously performed or currently being performed by this office.

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee:	LOE:
Contract Period: 04/29/2011 To 03/28/2013		0
This Action:		50
Total:		50

Work Plan / Cost Estimate Approvals

	Cost/Fee:	LOE:
Contractor WP Dated:		
Cumulative Approved:		

Work Assignment Manager Name Jason Dewees	(Signature)	(Date)	Branch/Mail Code: Phone Number 919-541-9724 FAX Number:
Project Officer Name Margaret Dougherty	(Signature)	(Date)	Branch/Mail Code: Phone Number: 919-541-2344 FAX Number:
Other Agency Official Name	(Signature)	(Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name Rodney-Daryl Jones	(Signature)	(Date)	Branch/Mail Code: Phone Number: 919-541-3112 FAX Number:

Statement of Work

I. Title: Support for Source Emissions Test Methods
Contractor Name: ERG
Contract #: EP-D-11-006
WA #: 2-03

II. CONTRACTING OFFICER REPRESENTATIVE

Jason M DeWees
U.S. EPA
Office of Air Quality Planning and Standards
Air Quality Assessment Division
Measurement Technology Group (E141-03)
Research Triangle Park, NC 27711

III. BACKGROUND

The Clean Air Act (CAA) establishes a national framework for air quality management in the United States. The 1990 amendments to the CAA, while leaving intact the basic structure of this program, mandated both new Federal programs for controlling air pollution and major philosophical changes in some of the existing programs. Notable new programs were the addition of a technology-based approach for controlling air toxics under Title III, the Title IV requirements for the reduction in acid deposition, and the addition of a federally mandated operating permits program under Title V.

The work to be performed under work assignment supports to the U.S. Environmental Protection Agency (EPA), Office of Air Quality Planning and Standards (OAQPS) developing emissions standards for new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAP) for source categories and developing standardized prescriptive procedures to characterize emissions from a wide spectrum of controlled and uncontrolled sources (also known as source characterization) and to develop, evaluate and promote compliance assurance monitoring methods.

As part of effort under this work assignment the contactor may evaluate alternative test methods and monitoring procedures, develop and promote the proper and consistent application of stationary source and ambient air emissions test and monitoring methods in the development and enforcement of emissions control programs nationally, and develop, evaluate, and demonstrate new emissions measurement technology.

IV. TASKS

Task 1 of this work assignment involves support for regulatory development of measurement procedures for Hazardous Air Pollutants. The goal is to limit risks to the public from exposure to 188 hazardous air pollutants (HAPs) that are listed in the CAA. The maximum achievable control technology (MACT) standards have been published for almost all source categories. EPA continues to revise MACT standards and to include residual risk standards which are designed to reduce any unacceptable public health risks from major sources. Stationary facilities including refineries and chemical industries include both ducted sources and area or fugitive sources that

contribute to the mixture of toxic air pollutants found in urban air sheds. The focus of Task 1 is evaluation of a method to measure fugitive and area source emissions at facility fencelines.

Task 1

The Contractor will initiate and coordinate the technical activities of the staff assigned to this project. The contractor shall prepare a work plan describing the technical approach for each of the tasks in this work assignment. In addition the contractor shall provide a cost and labor estimate for the total work assignment and the cost and labor required to complete each of the work assignment tasks. The contractor shall plan for monthly technical conference calls to brief the WAM and EPA team on progress or issues to complete each task. The Contractor shall provide monthly reports to the EPA contracting officer representative (COR) for this work assignment (WA). Monthly progress reports are required by the contract deliverables and must contain a summary of technical progress and work assignment resource use (labor and cost) information as required by the contract.

Task 1 Deliverables:

1. Work Plan
2. Monthly Progress Reports

Task 2

Contractor will provide round robin analysis support of approximately 45 sorbent tubes for 1,3 butadiene and benzene. The 1,3 butadiene and benzene tube analysis will be done by a minimum of 3 laboratories (if available) to assess the method performance of Draft Method 325.

EPA will provide sorbent tubes for this Task. The contractor should clean condition the tubes according to Draft Method 325. The contractor will provide prepare passive sorbent tube blanks, mid and high level spikes and "Other" ambient concentration tubes for Contractor shipment to analysis laboratories. The contractor will use a exposure chamber that has been previously characterized to expose the tubes homogeneously in batches of 9 to a known mid and high level spike with known ambient conditions (relative humidity and temperature). The specific concentration will be given through technical directive. The contractor will collect the ambient exposure round robin samples (9 tubes for the ambient 1,3 butadiene and benzene concentration level). The contractor will be responsible for shipment and return of sorbent tubes.

The contractor will also provide a clean evacuated canister and veriflow or equivalent sampling system and collect a TO-15 sample collected at ambient concentration simultaneous with the exposure of the ambient passive sorbent tubes. Contractor shall analyze this canister sample within 30 days of collection for 1,3 butadiene and benzene following the Contractors SOP for method TO-15.

The contractor shall also supply clean evacuated SUMMA canisters and veriflow or equivalent sampling systems for mid and high level sample collection by EPA. Contractor shall analyzed these 2 canisters samples for 1,3 butadiene and benzene within 30 days of collection following the Contractors SOP for method TO-15.

The laboratories should provide full laboratory narratives with raw data and excel summaries. Laboratory narratives should include any comments, suggestions or request for clarification of the Draft Method 325. Contractor will provide a letter report with a summary of the lab results and delivery of all raw and electronically available data.

The round robin experimental matrix will include 3 replicates of the sample type. EPA anticipates shipping two types of samples in shipment batch 1 and 2 for a total of 6 samples per laboratory per shipment and one batch in shipment batch 3 as shown in Table 1. These sample types correspond to zero, ambient, "low"-spiked, "mid"-spiked and "other." Laboratories must follow Draft Method 325 and report any deviations that are customary or required for their laboratory to complete the analysis.

The contractor will summarize the results of the round robin tests in a letter report that shall include but not be limited to:

- A narrative that describes the experimental design and samples supplied for the round robin laboratory tests.
- A table summarizing the laboratory results for all samples and:
    - The average value for replicate samples supplied to each laboratory.
    - The precision demonstrated by each laboratory as measured by the standard deviation of three analyses of each sample type,
    - The bias for mid and high level spiked sample analysis as compared to the canister analysis performed by the contractor and,
    - The accuracy of the mid and high level spiked sample analysis as compared to the known spike concentration supplied by EPA.
- An appendix with the original round robin laboratory test results including raw and electronic data from each analysis batch,
- An appendix containing the contractors TO-15 analysis raw results

Task 2 deliverables

A letter report summarizing the results of the round robin laboratory analyses as described required for Task 4.

Table 1. Shipping and experimental matrix for passive sorbent laboratory evaluation

Batch		**EPA**	**Contractor**	**Laboratory A**	**Laboratory B**	**Laboratory C**
1	**Zero (Blank)**	Supplies Tubes to Contractor	Blanks Tubes. Supplies Tubes to laboratories A,B,C.	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes
1	**Low range spike exposed sample (~5 ppb/24 hr)**	Supplies Tubes to Contractor.	Blanks and exposes tubes. TO-15 sample equipment to EPA, TO-15 analysis. Ships tubes to laboratories A,B,C. Collects TO-15 Sample	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes
2	**Ambient exposed sample (Contractor field collection)**	Supplies Tubes to Contractor	Blanks and exposes tubes. TO-15 and tube sampling and TO-15 analysis. Ships tubes to laboratories A,B,C. Collects TO-15 Sample	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes
2	**Mid Range Spike exposed sample (~25ppb/24hr)**	Supplies Tubes to Contractor.	Blanks and exposes tubes. TO-15 sample equipment to EPA, TO-15 analysis. Ships tubes to laboratories A,B,C. Collects TO-15 Sample	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes
3	**Other exposed sample (EPA field collection, unknown concentration)**	Supplies Tubes to Contractor.	Blanks tubes. Ships tubes to laboratories A,B,C.	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes	Analysis of Sorbent Tubes

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VI. SCHEDULE OF DELIVERABLES

Task	Activity	Date	Comments
1	Work Plan Provide Monthly Progress Reports	Within 15 days of work assignment receipt By the 15th of the following month	NA
2	A letter report and appendices summarizing the results of the round robin laboratory analyses as described required for Task 4.	2 weeks after receipt of final analyses from round robin laboratories.	

VII. REPORTING REQUIREMENTS

The reporting requirements are in accordance with the terms and conditions of the contract.

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-03

☐ Other ☒ Amendment Number: 000001

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-11-006	04/29/2011 To 03/28/2013 Base Option Period Number 1	Source Emission Test Methods

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW:

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☐ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 04/01/2012 To 03/28/2013

Comments:
The work plan dated 04/18/12 has been reviewed and we concur with the labor mix, technical hours (136), ODCs, total estimated cost $35,374 and completion date 03/31/13. This document is IAW the CMM 7.3.5.1(D)

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

SFO (*Max 2*) ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee:	LOE:
Contract Period: 04/29/2011 To 03/28/2013		50
This Action:		86
Total:		136

Work Plan / Cost Estimate Approvals

	Cost/Fee:	LOE:
Contractor WP Dated:		
Cumulative Approved:		

Work Assignment Manager Name Jason Dewees (Signature) (Date)	Branch/Mail Code: Phone Number 919-541-9724 FAX Number:	
Project Officer Name Margaret Dougherty (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-2344 FAX Number:	
Other Agency Official Name (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:	
Contracting Official Name Rodney-Daryl Jones (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-3112 FAX Number:	

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-03

☐ Other ☒ Amendment Number: 000002

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-11-006	04/29/2011 To 03/28/2013 Base Option Period Number 1	Source Emission Test Methods

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW:

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- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☐ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 04/01/2012 To 03/28/2013

Comments:
The purpose of this change is to modify the WA statement of work as per the attachment. This document is IAW the CMM 7.3.5.1(D).

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
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3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee:	LOE:
Contract Period: 04/29/2011 To 03/28/2013		136
This Action:		0
Total:		136

Work Plan / Cost Estimate Approvals

	Cost/Fee:	LOE:
Contractor WP Dated:		
Cumulative Approved:		

Work Assignment Manager Name Jason Dewees (Signature) (Date)	Branch/Mail Code: Phone Number 919-541-9724 FAX Number:	
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Other Agency Official Name (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:	
Contracting Official Name Rodney-Daryl Jones (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-3112 FAX Number:	

Statement of Work

I. Title: Support for Source Emissions Test Methods
Contractor Name: ERG
Contract #: EP-D-11-006
WA #: 2-03 Change 2

II. CONTRACTING OFFICER REPRESENTATIVE

Jason M DeWees
U.S. EPA
Office of Air Quality Planning and Standards
Air Quality Assessment Division
Measurement Technology Group (E141-03)
Research Triangle Park, NC 27711

III. BACKGROUND

The Clean Air Act (CAA) establishes a national framework for air quality management in the United States. The 1990 amendments to the CAA, while leaving intact the basic structure of this program, mandated both new Federal programs for controlling air pollution and major philosophical changes in some of the existing programs. Notable new programs were the addition of a technology-based approach for controlling air toxics under Title III, the Title IV requirements for the reduction in acid deposition, and the addition of a federally mandated operating permits program under Title V.

The work to be performed under work assignment supports to the U.S. Environmental Protection Agency (EPA), Office of Air Quality Planning and Standards (OAQPS) developing emissions standards for new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAP) for source categories and developing standardized prescriptive procedures to characterize emissions from a wide spectrum of controlled and uncontrolled sources (also known as source characterization) and to develop, evaluate and promote compliance assurance monitoring methods.

As part of effort under this work assignment the contactor may evaluate alternative test methods and monitoring procedures, develop and promote the proper and consistent application of stationary source and ambient air emissions test and monitoring methods in the development and enforcement of emissions control programs nationally, and develop, evaluate, and demonstrate new emissions measurement technology.

The goal of the tasks in this work assignment is to limit risks to the public from exposure to 188 hazardous air pollutants (HAPs) that are listed in the CAA. The maximum achievable control technology (MACT) standards have been published for almost all source categories. EPA continues to revise MACT standards and to include residual risk standards which are designed to reduce any unacceptable public health risks from major sources. Stationary facilities including refineries and chemical industries include both ducted sources and area or fugitive sources that contribute to the mixture of toxic air pollutants found in urban air sheds.

IV. TASKS

Task 1 of this work assignment involves support for regulatory development of measurement procedures for Hazardous Air Pollutants. The goal is to limit risks to the public from exposure to 188 hazardous air pollutants (HAPs) that are listed in the CAA. The maximum achievable control technology (MACT) standards have been published for almost all source categories. EPA continues to revise MACT standards and to include residual risk standards which are designed to reduce any unacceptable public health risks from major sources. Stationary facilities including refineries and chemical industries include both ducted sources and area or fugitive sources that contribute to the mixture of toxic air pollutants found in urban air sheds.

The focus of Tasks 1 through 4 was to evaluate laboratory performance following draft Method 325B to measure benzene and 1-3 butadiene captured on sorbent tubes. The focus of Tasks 5, 6, and 7 which are added to this work assignment cover the development of additional performance evaluation of Method 325A and B related to the effects of humidity, temperature, and emission concentration. Task 8 was added to identify candidate field sites to evaluate these Methods. Task 9 and 10 will provide contract support to evaluate field placement on the performance of these methods.

Task 1 Management and Workplan

The Contractor will initiate and coordinate the technical activities of the staff assigned to this project. The contractor shall prepare a work plan describing the technical approach for each of the tasks in this work assignment. In addition the contractor shall provide a cost and labor estimate for the total work assignment and the cost and labor required to complete each of the work assignment tasks. The contractor shall plan for monthly technical conference calls to brief the WAM and EPA team on progress or issues to complete each task. The Contractor shall provide monthly reports to the EPA contracting officer representative (COR) for this work assignment (WA). Monthly progress reports are required by the contract deliverables and must contain a summary of technical progress and work assignment resource use (labor and cost) information as required by the contract.

Task 1 Deliverables:

1. Work Plan
2. Monthly Progress Reports

Task 1b Management and Workplan

The contractor shall prepare a work plan describing the technical approach for tasks 5 through 10 described in this work assignment modification. In addition the contractor shall provide a cost and labor estimate for the total work assignment and the cost and labor required to complete each of the added work assignment tasks. The contractor shall plan for monthly technical conference calls to brief the WAM and EPA team on progress or issues to complete each task. The Contractor shall provide monthly reports to the EPA contracting officer representative (COR) for this work assignment (WA). Monthly progress reports are required by the contract deliverables and must contain a summary of technical progress and work assignment resource use (labor and cost) information as required by the contract.

Task 1b Deliverables:
1. Work Plan
2. Monthly Progress Reports

Task 2 QAPP Review - Complete

The contractor will review and comment on an EPA provided QAPP covering sorbent tube preparation, passive sorbent tube sample collection to measure benzene exposure and round robin laboratory analysis of sorbent tube samples. Quality Assurance Project Plan (QAPP) will be prepared and provided by EPA covering all the operations necessary to conduct a study to assess the ability of commercial laboratories to follow Draft Method 325B and analyzes passive sorbent tube samples for benzene; these operations will include sorbent tube preparation, sorbent tube benzene exposure, and a round robin lab analysis. The contractor will be mainly responsible for task associated with the round robin analysis as described in more detail below. The contractor will provide the summary of comments in word using the track changes and comments features in Microsoft Word.

Task 2 Deliverables:
1. Review comments and recommendations of project QAPP.

Task 3 Laboratory Survey

Contractor will identify no more than 9 North American commercial environmental laboratories capable of the analysis procedure provided under Task 2. Contractor shall provide a letter report and table describing how many laboratories are able to perform the sorbent tube preparation and the sample analysis described in Draft Method 325B. The report must contain but is not limited to:

- Legal Name and address of available laboratories,
- a description of the laboratory equipment used for this method,
- the analysis capacity in samples per day,
- the estimated detection limit (ug/tube) for each compounds.
- cost per tube preparation including the cost of media,
- cost per sample for analysis of a single component, (i.e., benzene) and
- cost per tube for analysis of a comprehensive list of air toxics such as found Table 1 of Draft Method 325B

Task 3 deliverables:
1. Contractor shall provide a letter report and table describing how many laboratories are able to perform the sorbent tube preparation and the sample analysis described in Draft Method325B.

Task 4 Laboratory Round Robin

Contractor will provide round robin analysis support of approximately 45 sorbent tubes for benzene. The benzene tube analysis will be done by a minimum of 3 laboratories (if available) to assess the method performance of Draft Method 325B.

EPA will provide clean conditioned sorbent tubes for this Task. EPA will provide prepare passive sorbent tube blanks, mid and high level spikes and "Other" ambient concentration tubes for Contractor shipment to analysis laboratories. The contractor will collect the ambient exposure round robin samples (9 tubes for the ambient benzene concentration level). The contractor will be responsible for shipment and return of sorbent tubes.

The contractor will also provide a clean evacuated canister and veriflow or equivalent sampling system and collect a TO-15 sample collected at ambient concentration simultaneous with the exposure of the ambient passive sorbent tubes. Contractor shall analyze this canister sample within 30 days of collection for benzene following the Contractors SOP for method TO-15.

The contractor shall also supply clean evacuated SUMMA canisters and veriflow or equivalent sampling systems for mid and high level sample collection by EPA. Contractor shall analyzed these 2 canisters samples for benzene within 30 days of collection following the Contractors SOP for method TO-15.

The laboratories should provide full laboratory narratives with raw data and excel summaries. Laboratory narratives should include any comments, suggestions or request for clarification of the Draft Method 325B. Contractor will provide a letter report with a summary of the lab results and delivery of all raw and electronically available data.

The round robin experimental matrix will include 3 replicates of the sample type. EPA anticipates shipping two types of samples in shipment batch 1 and 2 for a total of 6 samples per laboratory per shipment and one batch in shipment batch 3 as shown in Table 1. These sample types correspond to zero, ambient, mid-spiked, high-spiked and "other." Laboratories must follow Draft Method 325B and report any deviations that are customary or required for their laboratory to complete the analysis.

The contractor will summarize the results of the round robin tests in a letter report that shall include but not be limited to:

- A narrative that describes the experimental design and samples supplied for the round robin laboratory tests.
- A table summarizing the laboratory results for all samples and:
    - The average value for replicate samples supplied to each laboratory.
    - The precision demonstrated by each laboratory as measured by the standard deviation of three analyses of each sample type,
    - The bias for mid and high level spiked sample analysis as compared to the canister analysis performed by the contractor and,
    - The accuracy of the mid and high level spiked sample analysis as compared to the known spike concentration supplied by EPA.
- An appendix with the original round robin laboratory test results including raw and electronic data from each analysis batch,
- An appendix containing the contractors TO-15 analysis raw results

Task 4 deliverables

1. A letter report summarizing the results of the round robin laboratory analyses as described required for Task 4.

Task 5 QAPP

The contractor will prepare a Category III QAPP covering the environmental data operations in Tasks 6 and 7. Quality Assurance Project Plan (QAPP) will be prepared following the format in EPA/240/B-01/003, "EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5)." The contractor will provide the QAPP in MS-Word for EPA review and approval. No environmental data operations that involve the collection of measurements data for the draft methods will be started until the QAPP is approved by EPA.

Task 5 Deliverables:

1. QAPP for Task 6 and 7

Task 6: Evaluation of High Concentration Plume Sampler Performance.

The contractor will:

1. Condition a minimum of 21 clean Draft Method-325A/B sorbent tubes to ambient air for a 96 hour period. Three of these cleaned conditioned tubes will be archived and used as background samples.
2. Sequentially expose the remaining 18 conditioned tubes to a series of controlled benzene/butadiene mixture concentrations. Exposure temperature and humidity must be monitored continuously and recorded for the test duration. Gas flow in the exposure chamber must meet the requirements in Method 325B Appendix A. During exposure the contractor will monitor total hydrocarbon following Method 25A or an equivalent method. The contractor will confirm the exposure concentration by collecting integrated canister samples during each test series.
3. The intent is to complete the tube exposure under typical ambient conditions (average RH > 30%, average T > 15 °C) with successive challenges from pulses of well mixed benzene vapor in ambient air. Table 6-1 summarizes the proposed sequential exposure test matrix for this task.
4. The contractor will arrange for analysis by a laboratory with known precision of 7.5% for Method 325B benzene analysis of the exposed tubes following Draft Method 325B and analysis of the integrated canisters.

Table 6-1 Pulsed Exposure Test Matrix.

Test Set	Number of Tubes	Compound Concentration (each)	Exposure Duration	Equivalent Two Week Exposure ppbv
1	18	2.25 ppmv	15 minutes	1.67
2	15	2.25 ppmv	15 minutes	3.34

3	12	2.25 ppmv	15 minutes	5.02
4	9	2.25 ppmv	15 minutes	6.70
5	6	2.25 ppmv	15 minutes	8.37
6	3	2.25 ppmv	15 minutes	10

Task 6 deliverables:

1. Prepare a letter report summarizing the procedure used to challenge the sorbent tubes and the results of the analysis of the exposed sorbent tubes, canisters and exposure chamber environmental conditions.

Task 7: Evaluation of the effect of Temperature and Humidity on Sorbent Collection Performance

The contractor will:

1. Prepare a minimum of 15 clean Draft Method-325A/B sorbent tubes. Three of these cleaned conditioned tubes will be archived and used as background samples.
2. Sequentially expose 3 sorbent tubes per set to constant concentration of the two target compounds and a series of different humidity and temperature conditions summarized in Table 7-1 to approximate a 5 ppb exposure for a 2 week period. Tubes will be exposed for 24 hours. Each exposure must be monitored with an active canister sampling device which will collect and integrate the exposure concentration for each test series. Exposure temperature and humidity must be monitored and recorded for the exposure duration.
3. The contractor will arrange for analysis by a laboratory with known precision of 7.5% for Method 325B benzene analysis of the exposed tubes following Draft Method 325B and analysis of the integrated canisterscalculate the equivalent exposure concentration in ppbv experienced by the sorbent tubes and calculate the theoretical exposure concentration using the results of the simultaneous active canister sample analysis.

Table 7. Humidity and Temperature Challenge Experimental Matrix

Test Set	Temperature	Humidity	Exposure Concentration (ppb)	Exposure Time
1	~20 °F (~ -6.7 °C)	~ dry	~70	24 hours
2	~70 °F (~ 21 °C)	~50 % RH	~70	24 hours
3	~120 °F (~ 49 °C)	~ 70% RH	~70	24 hours
4	~120 °F(~ 49 °C)	~ 30% RH	~70	24 hours

Task 7 deliverables:

1) A full report summarizing Task 4, 6, and 7 experimental results and conclusions. The report will prepared in EPA format and include at a minimum:

a. a description of each test series, test matrix and testing procedure,
b. the results of each test series, and
c. conclusions based on the statistical treatment of the results.

The report must provide a tabular summary of the results of the tube analysis and canister analysis. The letter report must also compare the theoretical exposure to the actual measured sorbent tube exposure concentrations in ppm for each condition. The contractor will perform statistical analysis of the difference between the sorbent tube results, the active canister sample results and the theoretical spike amounts, as applicable, to describe uncertainty in the performance of the passive sorbent tube method .

Task 8: Compile electronic maps of typical refineries and define facility boundaries.

The contractor will:

1) Compile a list of U.S. refineries listed in the NEI index.
2) Using topographical maps available on the internet
    a. Identify 3 refinery facilities that fit into one of three geographical groupings most like the circular/oval, square and irregular property boundaries descriptions in Method 325A (i.e., 9 total facilities, 3 in each category).
    b. Using publicly available information identify which of these 9 facilities includes potential VOC emission sources within approximately 50 feet of the property boundary.
    c. Determine the fence line length for each of the facilities identified in a. above.
    d. Apply the sampling location criteria in Draft Method 325A to determine the number of sampling locations in a representative facility in each of the geographical categories.

Task 8 deliverables:

1. Letter report with tables identifying the facilities, address, fence line length for refinery facilities and maps (Google earth or equivalent) showing sampler placement for the representative geographical sites identified in this task. The report will include Google KMZ files or equivalent for each refinery and an excel spreadsheet/KMZ link, that summarizes the linear distance of the property boundary/fence line, classification of shape, and a summary of additional industrial facilities or activity around the facility boundary.

Task 9: Prepare a Field Test Plan to evaluate the seasonal performance of Method 325A and 325B.

After completion of tasks 6 through 8, The contractor will:

Prepare and submit a combined Field Test Plan/QA Project Plan to execute a Draft Method 325A/B monitoring program for one year at a site identified in Task 7 and selected with technical direction from the EPA WAM. The site characteristics should include a simple square or circular/oval property boundary with potential VOC emission sources within 50 feet of the facility property boundary line. Site selection criteria will include locations that require 12 to 15 passive sampler locations.

The field test plan will follow the basic format in EPA GD-0-42 for Preparation and Review of Site-specific Emission Test Plans as appropriate for area source extended duration field testing. The field test plan/QAPP will include appropriate additions from EPA QA/R-5 and siting requirements in Draft Method 325A for meteorological, passive sorbent sampling locations and quality control samples. The contractor will include Category III QA requirements intended to evaluate a new reference method with on other regulatory purpose.

Task 9 deliverables:
Draft Field Test/QA Project Plan

Task 10: Field Test Implementation

After completion of Task 9, the contractor will revise the Draft Field Test/QA Project Plan deliverable based on EPA review comments.

The contractor will implement the test plan as approved in the final Field Test/QA Project Plan. The contractor must follow the requirements in Draft Method 325A including requirements one year of sample collection, each sample will be collected over a 14 day period and the required number of duplicates and replicate samples will be included in the test matrix.

Task 10 deliverables:

1) The contractor will prepare quarterly analytical and meteorological data summary reports with field observation notes.
2) The contractor will calculate and provide tables and graphs of the rolling average benzene concentration for the sampling sites in the field test program.
3) The contractor will prepare a final report summarizing the field test program and test results that includes:
    a. Graphical display of the rolling average concentration of benzene at the sampling sites.
    b. Graphical display of concentration of benzene at each of the sampling sites as a function of wind speed, wind direction and temperature.
    c. Calculation of the rolling difference between the highest measured concentration and the lowest measured concentration for each sampling event in the program.

Table 1. Shipping and experimental matrix for passive sorbent laboratory evaluation

Batch	Sample Type	Eastern Research Group (ERG)	Laboratory A	Laboratory B	Laboratory C
1	Field Blank (Zero)	Supplies Tubes to fixed price laboratories.	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes
1	Low range spike exposed sample (~5 ppbv)	TO-15 sample equipment to ALION (24-hour integration), TO-15 GC/MS analysis (1 sample). Ships tubes to fixed price laboratories 1,2,3.	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes
2	Ambient exposed	TO-15 and tube sampling (72-96 hour integration) and TO-15	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes

	sample (ERG field collection)	GC/MS analysis (1 sample). Ships tubes to laboratories fixed price laboratories.			
2	Mid Range Spike exposed sample (~25ppbv)	TO-15 sample equipment to ALION (24-hour integration), TO-15 GC/MS analysis (1 sample). Ships tubes to laboratories fixed price laboratories.	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes
3	Other exposed sample (collection, unknown concentration)	TO-15 GC/MS analysis (1@54 hr collection and 1@ passive tube collection time). Ships tubes to laboratories fixed price laboratories.	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes	Analysis of 3 Sorbent Tubes

VI. SCHEDULE OF DELIVERABLES

Task	Activity	Date	Comments
1	Work Plan Provide Monthly Progress Reports	Within 15 days of work assignment receipt By the 15th of the following month	NA
2	Review and comment on EPA provided QAPP	2 weeks after receipt of QAPP	
3	Letter report summarizing available labs for passive sorbent tube analysis.	4 weeks after completion of work plan	
4	A letter report and appendices summarizing the results of the round robin laboratory analyses as described required for Task 4.	2 weeks after receipt of final analyses from round robin laboratories.	
5	Draft QAPP for EPA Review	1 month after completion of Workplan	
	Final QAPP	2 weeks after receipt of EPA comments	
6	Letter Report	2 weeks after receipt of lab analysis	
7	Full Report for Task 5, 6,7	1 month after receiving laboratory results from Tasks 6 and 7	

8	Report and required electronic files	90 days after completion of workplan	
9	Draft QAPP for EPA Review	1 month after completion of Task 7 Final Report	
	Final QAPP	2 weeks after receipt of EPA comments	
10	Quarterly Reports	1 month after receipt of final laboratory results for quarter	
	Final Report	60 days after receipt of final laboratory results for field campaign	

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-03

☐ Other ☒ Amendment Number: 000003

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-11-006	04/29/2011 To 03/28/2013 Base Option Period Number 1	Souce Emission Test Methods

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW:

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☐ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 04/01/2012 To 03/28/2013

Comments:
The purpose of this change is to add 80 hours at no additional cost to the Government. The added hours are needed to complete the final report for phase 1 of the SOW. The contractor utilized lower P level staff mix than initially planned and therefore the hours will be at no additional cost. The Work Plan Due Date is extended to 10/5/2012. This document is IAW the CMM 7.3.5.1(D)

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

SFO (*Max 2*) ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee:	LOE:
Contract Period: 04/29/2011 To 03/28/2013		0
This Action:		216
Total:		216

Work Plan / Cost Estimate Approvals

	Cost/Fee:	LOE:
Contractor WP Dated:		
Cumulative Approved:		

Work Assignment Manager Name Jason Dewees	(Signature)	(Date)	Branch/Mail Code: Phone Number 919-541-9724 FAX Number:
Project Officer Name Margaret Dougherty	(Signature)	(Date)	Branch/Mail Code: Phone Number: 919-541-2344 FAX Number:
Other Agency Official Name	(Signature)	(Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name Rodney-Daryl Jones	(Signature)	(Date)	Branch/Mail Code: Phone Number: 919-541-3112 FAX Number:

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-03

☐ Other ☒ Amendment Number: 000004

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-11-006	04/29/2011 To 03/31/2014 Base X Option Period Number	

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW:

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☐ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 04/01/2012 To 03/31/2013

Comments:
This Work Assignment Change extends the Period of Performance to read:03/31/2013 in accordance with the Period of Performance end date of Option Period I.

This amendment is in accordance with CMM 7.3.5.1 (D)

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period: 04/29/2011 To 03/31/2014 Cost/Fee: LOE:

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor WP Dated: Cost/Fee: LOE:

Cumulative Approved: Cost/Fee: LOE:

Work Assignment Manager Name Jason Dewees (Signature) (Date)	Branch/Mail Code: Phone Number 919-541-9724 FAX Number:
Project Officer Name Karen C. Watson (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-3114 FAX Number:
Other Agency Official Name (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name Rodney-Daryl Jones (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-3112 FAX Number: