EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-25

☐ Other ☒ Amendment Number: 000001

Contract Number: EP-D-14-032

Contract Period: 09/16/2014 To 09/15/2017

Base Option Period Number: 2

Title of Work Assignment/SF Site Name: BenMAP-CE/GIS/Bugs

Contractor: INDUSTRIAL ECONOMICS, INCORPORATED

Specify Section and paragraph of Contract SOW: 1,10,14

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

Period of Performance: From 09/16/2016 To 09/15/2017

Comments:
The work plan and cost estimate dated 10/13/2016 have been received, reviewed, and are hereby approved for 724 hours and $89,604.99. No previously performed work shall be duplicated.

☐ 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
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

		Cost/Fee:	LOE:
Contract Period:	09/16/2014 To 09/15/2017	$0.00	0
This Action:		$89,604.99	724
Total:		$89,604.99	724

Work Plan / Cost Estimate Approvals

		Cost/Fee	LOE:
Contractor WP Dated:	10/13/2016	$89,604.99	724
Cumulative Approved:		$89,604.99	724

Work Assignment Manager Name: Neal Fann
(Signature) (Date)
Branch/Mail Code:
Phone Number: 919-541-0209
FAX Number:

Project Officer Name: Carolyn Blake
(Signature) (Date)
Branch/Mail Code:
Phone Number: 919-541-5256
FAX Number:

Other Agency Official Name:
(Signature) (Date)
Branch/Mail Code:
Phone Number:
FAX Number:

Contracting Official Name: Natalia Fisher-Jackson
NATALIA FISHER-JACKSON
Digitally signed by NATALIA FISHER-JACKSON
DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=NATALIA FISHER-JACKSON, dnQualifier=0000016076
Date: 2016.11.02 22:17:35 -04'00'
(Signature) (Date)
Branch/Mail Code:
Phone Number: 919-541-3564
FAX Number:

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-25

☐ Other ☒ Amendment Number: 000001

Contract Number: EP-D-14-032

Contract Period: 09/16/2014 To 09/15/2017

Base Option Period Number: 2

Title of Work Assignment/SF Site Name: BenMap-CE/GIS/Bugs

Contractor: INDUSTRIAL ECONOMICS, INCORPORATED

Specify Section and paragraph of Contract SOW: 1,10,14

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

Period of Performance: From 09/16/2016 To 09/15/2017

Comments:
The revised work plan dated 11/14/2016 has been reviewed and is hereby approved for an additional 372 hours and $50,736.66 (cumulative increase: LOE/1,096; Cost_Fee/$140,341.65). No previously performed work shall be duplicated.

☐ 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
1										
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Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/16/2014 To 09/15/2017	$89,604.99	724
This Action:	$50,736.66	372
Total:	$140,341.65	1,096

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 11/14/2016	$50,736.66	372
Cumulative Approved:	$140,341.65	1,096

Work Assignment Manager Name: Neal Fann	(Signature)	(Date)	Branch/Mail Code: Phone Number: 919-541-0209 FAX Number:
Project Officer Name: Carolyn Blake	(Signature)	(Date)	Branch/Mail Code: Phone Number: 919-541-5256 FAX Number:
Other Agency Official Name	(Signature)	(Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Natalia Fisher-Jackson	(Signature)	(Date)	Branch/Mail Code: Phone Number: 919-541-3564 FAX Number:

NATALIA FISHER-JACKSON

Digitally signed by NATALIA FISHER-JACKSON
DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=NATALIA FISHER-JACKSON, dnQualifier=0000016076
Date: 2016.11.22 08:31:32 -05'00'

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-25

☐ Other ☒ Amendment Number: 000001

Contract Number: EP-D-14-032	Contract Period: 09/16/2014 To 09/15/2017 Base Option Period Number: 2	Title of Work Assignment/SF Site Name: BenMAP-CE/GIS/Bugs
Contractor: INDUSTRIAL ECONOMICS, INCORPORATED	Specify Section and paragraph of Contract SOW: 1,10,14	

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

Period of Performance: From 09/16/2016 To 09/15/2017

Comments:
SOW amended (changes are in red). Contractor shall provide a revised cost estimate. No previously performed work shall be duplicated.

☐ 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
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4										
5										

Authorized Work Assignment Ceiling

Contract Period: 09/16/2014 To 09/15/2017 — 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: Neal Fann (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-0209 FAX Number:	
Project Officer Name: Carolyn Blake (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-5256 FAX Number:	
Other Agency Official Name: (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:	
Contracting Official Name: Natalia Fisher-Jackson NATALIA FISHER-JACKSON (Signature) (Date)	Digitally signed by NATALIA FISHER-JACKSON DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=NATALIA FISHER-JACKSON, dnQualifier=0000016076 Date: 2016.10.25 16:27:18 -04'00'	Branch/Mail Code: Phone Number: 919-541-3564 FAX Number:

I. TITLE: Continuing Work to Improve the BenMAP-CE Geographic Information System and Address Bugs

II. WORK ASSIGNMENT MANAGER (WAM):

Neal Fann
EPA, OAQPS, OAR
C539-07
RTP, NC 27711
919-541-0209

III. LEVEL OF EFFORT:

Hours :
Duration: 12 months (September 16th 2016 to September 15th 2017)

IV. BACKGROUND:

In 2003 the U.S. EPA contracted with a developer to create version 1.0 of the environmental Benefits Mapping and Analysis Program (BenMAP). That tool systematized a number of the steps of a health impact and benefits analysis that had previously been performed using the Criteria Air Pollutant Modeling System (CAPMS). Subsequent versions of BenMAP incorporated a number of new features, including a database that could be modified by end-users, more spatially resolved baseline health data and a broader array of health impact functions. The U.S. EPA has used BenMAP to estimate the avoided human health impacts and economic benefits of a number of air quality policies, including the 2002 Non-Road Diesel Rule, the 2004 Clean Air Interstate Rule, and the 2011 Mercury and Air Toxics Rules, among many others. Over 50 researchers have published over 25 journal articles using BenMAP.

Beginning in 2011, the U.S. EPA began redeveloping the tool from the ground-up to meet two goals: (1) create an open-source software platform so that anyone could see the software code and improve the program; (2) improve the performance, accessibility, capabilities and usability of the software. In the Fall of 2013, after iterating through dozens of beta versions, the U.S. EPA released version 1.0 of the environmental Benefits Mapping and Analysis Program—Community Edition (BenMAP-CE). In the winter of 2015, the Agency released version 1.1 of the software, which addressed a number of bugs identified in version 1.0 and incorporated several new features designed to make it easier for non-U.S. analysts to apply the program.

Under Work Assignment 1-16, the Contractor addressed a number of technical limitations in the Geographic Information System and Pooling Windows.

This work assignment continues that work and specifies a series of additional changes to be made to the program to address critical limitations and bugs.

V. STATEMENT OF WORK (SOW):

The Contractor shall conduct the following tasks in accomplishing the objective of this Work Assignment.

Task 1: Develop a work plan and project plan

The Contractor shall develop a new work plan and update the system design document as described below.

Task 1.a: Develop work plan and administer project

Within 20 calendar days of the effective date of this WA, the Contractor shall submit a work plan to the Work Assignment Manager (WAM). The Contractor shall arrange and conduct an initial phone conference with the WAM within one week of WA approval. Subsequent to this initial teleconference, the Contractor shall lead regular phone conferences on at least a weekly basis to discuss work progress and any issues associated with the work tasks. The Contractor shall prepare an agenda for such weekly meetings, record meeting minutes, and distribute such meeting minutes to all participants.

Task 1.b: Update the system design document

The Contractor, consulting with the WAM, shall develop a comprehensive and detailed project plan for each task in this WA, specifying clearly the technical and functional basis for the new version:

- The minimum design characteristics of the new software
- A workflow describing the expected inputs and outputs of each new program algorithm, including example use cases.
- Desired behavior of the graphical user interface, including sketches of windows, location of hover text, etc.
- Protocol for quality assurance of each new feature.
- Sequence in which the Contractor will address the tasks below.

The Contractor shall not modify the source code until the WAM approves this project plan. The Contractor shall develop the system design document for each new BenMAP-CE feature on a rolling basis and in consultation with the Work Assignment Manager.

Deliverables:

1.1. Work plan

1.2. System design document

Task 2: Address Critical Bugs and incorporate new features

The public release version of the BenMAP-CE software includes a number of limitations and bugs that are documented in the JIRA tracking system. The Contractor shall address ~~the following~~ bugs **in the program, including (but not limited to)**:

- BENMAP-179: Include additional features in the audit trail report
- BENMAP-193: Modify the GIS to permit users to change the "administrative layer" superimposed on air quality and incidence results
- BENMAP-200: Ensure that *.cfgrx and *.apvrx files are fully transferrable between users running the same version of BenMAP-CE
- BENMAP-202 & BENMAP-220: Ensure that the program re-aggregates results correctly
- BENAMP-207: Ensure that users can add a new grid to a newly created setup
- BENMAP-215: Ensure that users can import economic value estimates as a *.csv or *.xls or *.xlsx file
- BENMAP-216: When users remove a grid, the program should remove all dependent data (including incidence rates, population files, etc).
- BENMAP-217: Improve the procedure for creating crosswalks among grids
- BENMAP-218: The population map should be more informative to users
- BENAMP-219: The program should provide an error when attempting to import an incompatible *.bdbx file

In addition to the above bugs and features, the Contractor shall also:

- **Address technical limitations in the program that prevent the Contractor and EPA staff from completing the aeroallergen analysis in BenMAP-CE**
- Include a window confirming the key parameters of a BenMAP-CE configuration analysis. Such parameters should include the population year, endpoints and incidence rates.
- Modify the configuration window so that the health impact function being calculated appears above the progress bar.

Deliverables:

2.1. Revised draft version of program correcting bugs and adding new features
2.2. Final version of program correcting bugs and adding new features

Task 3 Updated economic values

The Contractor shall complete work begun under WA 1-16 to deliver the WAM updated inflation datasets through the most recently available year. Such datasets include the All Goods Index, the Medical Cost Index and the Wage Index. The Contractor shall also update the county-level median income values. The Contractor shall deliver these updated data to the WAM in BenMAP-CE-ready input format as .csv and .xlsx files, and update the user manual as appropriate.

The Contractor shall also re-index all of the United States Cost of Illness and Willingness to Pay economic unit values from a base year of 2000 to a base year of 2010. The Contractor shall update the user manual as appropriate. The Contractor shall provide these data to the WAM in BenMAP-CE ready input format as a .csv and .xlsx file.

Deliverables:

3.1. Updated economic valuation functions
3.2. Revised user manual

Task 4

In IEc Work Assignments 1-11 and 1-16, the Contractor began modifying the BenMAP-CE GIS and pooling windows. In this work assignment, the Contractor shall complete this work by:

- **Completing all tasks described in IEc WA 1-11 Task #2, which directs the Contractor to modify the BenMAP-CE pooling windows to make them easier to operate**
- **Completing all tasks described in IEc WA 1-16 Task #2, which directs the Contractor to modify the BenMAP-CE Geographic Information System, Database Elements and User interface.**

VI. Reporting Requirements:

All reports shall be in accordance with contract specifications. The Contractor shall submit work products in electronic as well as hard copy form. In addition, the Contractor shall deliver to the WAM each draft and final report in electronic format that is readable by OAQPS's windows-based word-processing (Microsoft Word 2007), graphics (Microsoft PowerPoint 2007), spreadsheet (Excel 2007), and database (Access 2007) programs.

VII. QA Requirements:

The Contractor shall include a quality assurance section in the final report discussing the data used with respect to precision, accuracy, representativeness, comparability, completeness, sensitivity and appropriateness as it applies to this use and its source. The QA section shall discuss how the Contractor ensured that the environmental data were of acceptable quality and that they were being used for the purpose for which they were collected.

VIII. Deliverables:

The Contractor shall adhere to the following schedule:

Task	Deliverable	Delivery Schedule
1.1	Cost estimate	20 days after effective date of WA
1.2	System design document	Ongoing
2.1	Revised draft version of BenMAP-CE	4 months after the effective date of the WA
2.2	Revised final version of BenMAP-CE	6 months after effective date of WA
3.1	Updated economic valuation functions	1 month after effective date of WA
3.2	Revised user manual	2 months after effective date of WA

EPA

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Washington, DC 20460

Work Assignment

Work Assignment Number: 2-25

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-14-032	09/16/2014 To 09/15/2019 Base Option Period Number 2	BenMAP-CE/GIS/Bugs

Contractor: INDUSTRIAL ECONOMICS, INCORPORATED

Specify Section and paragraph of Contract SOW: 1, 10, 14

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

Period of Performance: From 09/16/2016 To 09/15/2017

Comments:

THE WORK ASSIGNMENT INCLUDES 145 HOURS FOR PREPARATION OF THE WORKPLAN/COST ESTIMATE AND TO BEGIN THE WORK ASSIGNMENT. THE CONTRACTOR SHALL PROPOSE THE HOURS NECESSARY TO COMPLETE ALL TASKS. NO PREVIOUSLY PERFORMED WORK SHALL BE DUPLICATED. SEE ATTACHED SOW.

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

SFO (Max 2) ☐

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1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period: 09/16/2014 To 09/15/2019 — 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: Neal Fann (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-0209 FAX Number:	
Project Officer Name: Carolyn Blake (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-5256 FAX Number:	
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Contracting Official Name: Natalia Fisher-Jackson NATALIA FISHER-JACKSON (Signature) Digitally signed by NATALIA FISHER-JACKSON DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=NATALIA FISHER-JACKSON, dnQualifier=0000016076 Date: 2016.08.31 17:03:51 -04'00' (Date)	Branch/Mail Code: Phone Number: 919-541-3564 FAX Number:	

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919-541-0209

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1.1. Work plan

1.2. System design document

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Deliverables:

3.1 Updated economic valuation functions
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2.2	Revised final version of BenMAP-CE	6 months after effective date of WA
3.1	Updated economic valuation functions	1 month after effective date of WA
3.2	Revised user manual	2 months after effective date of WA