EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 4-12

☐ Other ☐ Amendment Number:

Contract Number: EP-D-11-006

Contract Period: 04/29/2011 To 03/31/2015
Base Option Period Number 3

Title of Work Assignment/SF Site Name: Develop EF for use with MARKAL

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW:

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

Period of Performance: From 10/06/2014 To 03/31/2015

Comments:
The work plan dated 11/26/14 has been reviewed and we concur with the labor mix, technical hours (282) ODCs, total estimated cost $29,971 and completion date 03/31/15 as specified. No previous work performed shall be duplicated.

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

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

SFO (Max 2):

LN	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	Cost/Fee	LOE
04/29/2011 to 03/31/2015	$0.00	0
This Action	$29,971.00	282
Total	$29,971.00	282

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated 11/26/2014	$29,971.00	282
Cumulative Approved	$29,971.00	282

Work Assignment Manager Name: Dan Loughlin	Branch/Mail Code:
(Signature) (Date)	Phone Number: 919-541-3928
	FAX Number:
Project Officer Name: Margaret Dougherty	Branch/Mail Code:
(Signature) (Date)	Phone Number: 919-541-2344
	FAX Number:
Other Agency Official Name:	Branch/Mail Code:
(Signature) (Date)	Phone Number:
	FAX Number:
Contracting Official Name: Rodney-Daryl Jones	Branch/Mail Code:
Rodney-Daryl (Signature) DEC 19 2014 (Date)	Phone Number: 919-541-3112
	FAX Number:

Work Assignment Form (WebForms v1.0)

EPA

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Washington, DC 20460

Work Assignment

Work Assignment Number: 4-12

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-11-006	04/29/2011 To 03/31/2015 Base Option Period Number 3	Develop EF for use with MARKAL

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW: K

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

Period of Performance: From 10/06/2014 To 03/31/2015

Comments:
This is the initiation of a work assignment for the Option III period. Hours have been authorized for the work plan and also for work to begin (150 hours). This work does not duplicate any work previously performed or is currently being performed.

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

Note: To report additional accounting and appropriations data 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	Cost/Fee	LOE
	04/29/2011 To 03/31/2015		
This Action			
Total			

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated		
Cumulative Approved		

Work Assignment Manager Name: Dan Loughlin (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-3928 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) NOV 06 2014	Branch/Mail Code: Phone Number: 919-541-3112 FAX Number:	

Work Assignment Form. (WebForms v1.0)

Statement of Work

I. Title: Developing light- and heavy-duty emission factors for use with the U.S. EPA's MARKAL modeling
Contractor Name: Eastern Research Group
Contract #: EP-D-11-006
WA#: 4-12
WAM: Dan Loughlin, (919)541-3928

II. Background and Objectives

As part of EPA ORD's on-going efforts to understand the environmental impacts of anticipated future changes in technology choice and use in the energy system, ORD's Energy and Climate Assessment team (ECAT) continues to update and improve their unique database representation (EPAUS9r) of the U.S. energy system developed for use with the MARKAL model and to use this database in scenario-based modeling studies. MARKAL is a least cost optimization model that uses technology costs and efficiencies to determine the technological mix necessary to meet stated energy demands and system constraints.

One goal of ECAT's scenario based modeling is to evaluate the CO_2 and air quality emissions profiles of different energy futures. A large contributor to these emissions is the transportation sector. The EPAUS9r characterizes mobile sources for light- and heavy- duty vehicles as well as off-highway mobile sources for vehicles existing in 2005 to future vehicle vintages through 2055. Emissions are specified by vehicle class, fuel type, vintage year, and region. The recent Tier III standards will lead to reduced emissions from many of these vehicles out into future years.

The goal of this effort is improve the emissions representation of light- and heavy-duty on-highway mobile sources by developing updated emission factors that take into account Tier 3 using the MOVES model.

III. Scope of Work

The Contractor shall develop emission factors for light- and heavy-duty on-highway mobile sources that account for the recent Tier III emission standards. The Contractor shall place those factors into a template that will be provided by the WAM. Factors shall be provided as a function of pollutant species, vehicle type, fuel, vintage, year of operation, type of source, and U.S. Census Division.

Pollutant species to be included are: NOx, PM10, PM2.5, SO2, VOC, CO, BC and OC, and if available in MOVES, CH4, N2O and NH3.

Light duty vehicle types to be included are: mini cars, compact cars, full size cars, minivans, pickups, small SUVs, and large SUVs.

Heavy duty vehicle types to be included are: buses, commercial trucks, heavy duty long haul trucks, heavy duty short haul trucks, and medium duty.

Fuels to be included are: gasoline, E85, E10, E15, diesel, B20, CNG, LPG, electric (possibly hybrid and plug-in hybrid, depending on representation)

Vintages to be included are: every 5 years, from 2005 through 2055

Years of operation are: 5-year increments for a typical lifetime of a vehicle type (typically 20 years), such that degredation of pollutant equipment over the life of the vehicle can be considered

Type of sources included are: refueling, tire and break wear, combustion, and other.

The spatial resolution for each factor is the U.S. Census Division resolution.

To accomplish this effort, the following tasks are required:

Task 1. The Contractor shall meet with the WAM to clarify any outstanding questions regarding the scope of work.

Task 2. The Contractors shall develop a quality assurance project plan (with assistance from the WAM) that will describe the quality assurance metrics and measures that will be taken. The QAPP shall address the items listed in Appendix 1 of this SOW.

Task 3. After approval of the QAPP by the EPA Quality Assurance Manager, the Contractor shall receive the data template from the WAM. The Contractor shall inspect the data template shall work with the WAM to revise, if necessary.

Task 4. The Contractor shall develop the emission factors using the MOVES model and populate the template.

Task 5. The Contractor shall document the quality assurance steps that were taken, as well as any limitations associated with the emission factors derived in this Work Assignment.

IV. Deliverables

The following deliverables are required:

Deliverable 1: The Contractor shall provide the QAPP within four weeks of receipt of this SOW.

Deliverable 2: The Contractor shall schedule a kick-off meeting with members of the Energy and Climate Assessment Team within four weeks of receipt of this SOW.

Deliverable 3: The Contractor shall schedule monthly updates with the WAM to review current progress on the contract.

Deliverable 4: The Contractor will deliver data and documentation pertaining to Tasks 4 and 5 within six months of receipt of this SOW.

IV. Quality Requirements

The contractor will develop quality assurance documentation as required in Attachment #1 and Attachment #2 to this SOW. Work involving environmental data will not commence until the quality assurance documentation has received official approval from the EPA quality assurance staff.

Attachment #1: NRMRL QA Requirements and Definitions

EPA=s Quality System Website: http://www.epa.gov/quality/

EPA=s Requirements and Guidance Documents: http://www.epa.gov/quality/qa_docs.html

In accordance with EPA Order 5360.1 A2, conformance to ANSI/ASQC E4 must be demonstrated by submitting the quality documentation described herein. All quality documentation shall be submitted to the Government for review. The Government will review and return the quality documentation, with comments, and indicate approval or disapproval. If the quality documentation is not approved, it must be revised to address all comments and shall be resubmitted to the Government for approval. Work involving environmental data collection, generation, use, or reporting shall not commence until the Government has approved the quality documentation. The QAPP shall be submitted to the Government at least thirty (30) days prior to the beginning of any environmental data gathering or generation activity in order to allow sufficient time for review and revisions to be completed. After the Government has approved the quality documentation, the Contractor shall also implement it as written and approved by the Government.

Definitions:

Environmental Data - These are any measurements or information that describe environmental processes, location, or conditions; ecological or health effects and consequences; or the performance of environmental technology. For EPA, environmental data include information collected directly from measurements, produced from software and models, and compiled from other sources such as data bases or the literature.

Quality Assurance (QA) - Quality assurance is a system of management activities to ensure that a process, item, or service is of the type and quality needed by the customer. It deals with setting policy and running an administrative system of management controls that cover planning, implementation, and review of data collection activities and the use of data in decision making. Quality assurance is just one part of a quality system.

Quality Assurance Project Plan (QAPP) - A QAPP is a document that describes the necessary quality assurance, quality control, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria. A QAPP documents project-specific information.

Quality Control (QC) - Quality control is a technical function that includes all the scientific precautions, such as calibrations and duplications, that are needed to acquire data of known and adequate quality.

Quality Management Plan (QMP) - A QMP is a document that describes an organization=s/program=s quality system in terms of the organizational structure, policy and procedures, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, documenting, and assessing all activities conducted. A QMP documents the overall organization/program, and is primarily applicable to multi-year, multi-project efforts. An organization=s/program=s QMP shall address all elements listed in the ARequirements for Quality Management Plans@ in Appendix B of the NRMRL QMP.

Quality System - A quality system is the means by which an organization manages its quality aspects in a systematic, organized manner and provides a framework for planning, implementing, and assessing work performed by an organization and for carrying out required quality assurance and quality control activities.

R-2 - EPA Requirements for Quality Management Plans (EPA/240/B-01/002) March, 2001, http://www.epa.gov/quality/qs-docs/r2-final.pdf

R-5 - EPA Requirements for QA Project Plans (EPA/240/B-01/003) March, 2001 http://www.epa.gov/quality/qs-docs/r5-final.pdf

Substantive Change - Substantive change is any change in an activity that may alter the quality of data being used, generated, or gathered.

- **NRMRL=s Quality System Specifications:**

(1) a description of the organization=s Quality System (QS) and information regarding how this QS is documented, communicated and implemented;

(2) an organizational chart showing the position of the QA function;

(3) delineation of the authority and responsibilities of the QA function;

(4) the background and experience of the QA personnel who will be assigned to the project; and

(5) the organization=s general approach for accomplishing the QA specifications in the SOW.

Category Level Designations (determines the level of QA required):

- **Category I Project** - applicable to studies performed to generate data used for enforcement activities, litigation, or research project involving human subjects. The QAPP shall address all elements listed in R-5.
- **Category II Project** - applicable to studies performed to generate data used in support of the development of environmental regulations or standards. The QAPP shall address all elements listed in R-5.
- **Category III Project** - applicable to projects involving applied research or technology evaluations. The QAPP shall address the applicable sections of R-5, as outlined in the NRMRL QAPP requirements for the specific project type (see below).
- **Category IV Project** - applicable to projects involving basic research or preliminary data gathering activities. The QAPP shall address the applicable sections of R-5, as outlined in the NRMRL QAPP requirements for the specific project type (see below).

Guidance for QAPPs by Project Type (described in more detail on subsequent pages):

These outlines of NRMRL QAPP Requirements for various project types, from Appendix B of the NRMRL QMP (except where otherwise noted), are condensed from typically applicable sections of R-5 (EPA Requirements for QA Project Plans) and are intended to serve as a starting point when preparing a QAPP. These lists and their format may not fit every research scenario, and QAPPs must conform to applicable sections of R-5 in a way that fully describes the research plan and appropriate QA and QC measures to ensure that the data are of adequate quality and quantity to fit their intended purpose.

- ☐ **Applied Research Project** - pertains to a study performed to generate data to demonstrate the performance of accepted processes or technologies under defined conditions. These studies are often pilot- or field-scale. Additional guidance is given in AQAPP Requirements for Applied Research Projects@.

- ☐ **Basic Research Project** - pertains to a study performed to generate data used to evaluate unproven theories, processes, or technologies. These studies are often bench-scale. Additional guidance is given in AQAPP Requirements for Basic Research Projects@.

- ☐ **Design, Construction, and/or Operation of Environmental Technology Project** - pertains to engineering projects involving environmental technologies, an all inclusive term used to describe pollution control devices and systems, waste treatment processes and storage facilities, and site remediation technologies and their components that may be utilized to remove pollutants or contaminants from or prevent them from entering the environment. Comprehensive guidance can be found in the EPA Quality System document AGuidance on Quality Assurance for Environmental Technology Design, Construction, and Operation@ G-11, at http://www.epa.gov/quality/qs-docs/g11-final-05.pdf.

- ☐ **Method Development Project** - pertains to situations where there is no existing standard method, or a standard method needs to be significantly modified for a specific application. Additional guidance is given in AQAPP Requirements for Method Development Projects@ .

- ☐ **Model Development Project** - includes all types of mathematical models including static, dynamic, deterministic, stochastic, mechanistic, empirical, etc. Additional guidance is given in AGuidance for Quality Assurance Project Plans for Modeling@ G-5M, http://www.epa.gov/quality/qs-docs/g5m-final.pdf. Abbreviated guidance is provided in AQAPP Requirements for Research Model Development and Application Projects@.

- ☐ **Sampling and Analysis Project** - pertains to the collection and analysis of samples with no objectives other than to provide characterization or monitoring information. Additional guidance is given in AQAPP Requirements for Sampling and Analysis Projects@.

- X **Secondary Data Project** - pertains to environmental data collected from other sources, by or for EPA, that are used for purposes other than those originally intended. Sources may include: literature, industry surveys, compilations from computerized databases and information systems, and computerized or mathematical models of environmental processes. Additional guidance is given in AQAPP Requirements for Secondary Data Projects@.

Attachment #2: QAPP REQUIREMENTS FOR PROJECTS USING SECONDARY DATA

A secondary data project involves the gathering and/or use of existing environmental data for purposes other than those for which they were originally collected. These secondary data may be obtained from many sources, including literature, industry surveys, compilations from computerized databases and information systems, and computerized or mathematical models of environmental processes. For these projects, a QAPP shall be prepared to include the requirements identified below. If primary data will also be generated as part of the project, then the information below can be incorporated into the associated QAPP to address the secondary data. The following requirements should be addressed as applicable.

SECTION 1.0, PROJECT OBJECTIVES, ORGANIZATION, AND RESPONSIBILITIES

1.1 The purpose of study shall be clearly stated.

1.2 Project objectives shall be clearly stated.

1.3 The secondary data needed to satisfy the project objectives shall be identified. Requirements relating to the type of data, the age of data, geographical representation, temporal representation, and technological representation, as applicable, shall be specified.

1.4 The planned approach for evaluating project objectives, including formulas, units, definitions of terms, and statistical analysis, if applicable, shall be included.

1.5 Responsibilities of all project participants shall be identified, meaning that key personnel and their organizations shall be identified, along with the designation of responsibilities for planning, coordination, data gathering, data analysis, report preparation, and quality assurance, as applicable

SECTION 2.0, SOURCES OF SECONDARY DATA

2.1 The source(s) of the secondary data must be specified.

2.2 The rationale for selecting the source(s) identified shall be discussed.

2.3 The sources of the secondary data will be identified in any project deliverable.

SECTION 3.0, QUALITY OF SECONDARY DATA

3.1 Quality requirements of the secondary data must be specified. These requirements must be appropriate for their intended use. Accuracy, precision, representativeness, completeness, and comparability need to be addressed, if applicable. (If appropriate, a related QAPP containing this information can be referenced.)

3.2 The procedures for determining the quality of the secondary data shall be described.

3.3 If no quality requirements exist, this shall be stated in the QAPP. If no quality requirements exist or if the quality of the secondary data will not be evaluated by EPA, the QAPP shall require that a disclaimer be added to any project deliverable to indicate that the quality of the secondary data has not been evaluated by EPA for this specific application. The wording for the disclaimer shall be defined.

SECTION 4.0, DATA REPORTING, DATA REDUCTION, AND DATA VALIDATION

4.1 Data reduction procedures specific to the project shall be described, including calculations and equations.

4.2 The data validation procedures used to ensure the reporting of accurate project data shall be described.

4.3 The expected product document that will be prepared shall be specified (*e.g.*, journal article, final report, *etc.*).