


# RESEARCH PERFORMANCE PROGRESS REPORT

## 1) COVER PAGE DATA ELEMENTS: Mandatory

<b>Federal Agency and Organization Element to Which Report is Submitted</b>	U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL)
<b>Federal Grant or Other Identifying Number Assigned by Agency</b>	DE-FE0029085
<b>Project Title</b>	Long-Term Methane Emissions Rate Quantification and Alert System for Natural Gas Storage Wells and Fields
<b>PI Name, Title and Contact Information</b>	Ann P. Smith, Vice President <a href="mailto:apsmith@gsi-net.com">apsmith@gsi-net.com</a> 512-346-4474
<b>Submission Date</b>	January 31, 2017
<b>DUNS Number</b>	181780776
<b>Recipient Organization</b>	GSI Environmental Inc. 9600 Great Hills Trail, Suite 350E Austin, Texas 78759
<b>Project Period</b>	October 1, 2016 to May 31, 2019
<b>Reporting Period End Date</b>	December 31, 2016
<b>Report Term or Frequency</b>	Quarterly
<b>Signature of Submitting Official</b>	

## 2) ACCOMPLISHMENTS: Mandatory

### a) What are the major goals of the project?

The primary goals of the project is to employ a novel combination of complementary measurement methods and technologies to detect and accurately quantify average annual methane emissions from an underground natural gas storage facility, including from above-ground equipment leaks plus seepage at the ground surface from underground leaks.

### b) What was accomplished under these goals?

All project goals for the first quarter (Q1) reporting period of October 2016 – December 2016 were met. A summary of the activities performed to achieve project goals during Q1 is included below.

**Planning:** During Q1, GSI developed and submitted to DOE NETL a Project Management Plan (PMP), a Technology Transfer Implementation Strategy document, and a Work Plan (WP). The WP includes a project overview, detailed description of the field sampling and analysis plan, and health and safety procedures to be implemented in the field.

**Kickoff Meeting:** A kick-off meeting was held on October 21, 2016 with attendees from GSI, DOE NETL and DOE Headquarters to discuss project objectives, sampling methodologies, and data analysis procedures. In attendance from DOE were Gary Covatch, Jared Ciferno, Christopher Freitas, Richard Hammack, and David Cercone. In attendance from GSI were Susan Stuver, Ric Bowers, Ann Smith, and Steve Richardson.

**Data Source Status Assessment:** GSI developed and submitted to DOE NETL a Data Source Status Assessment report, which summarizes key information and data sources relating to the frequency and magnitude of overall methane emissions from U.S. underground natural gas storage facilities.

**Development of TASC:** Effort was undertaken during Q1 to recruit Technical Advisory Steering Committee (TASC) members. This included telephone calls, electronic mailers and personal email requests. Representatives from industry, academia, non-governmental organizations, government organizations and regulators were solicited.

**c) What opportunities for training and professional development has the project provided?**

Not Applicable during this reporting period.

**d) How have the results been disseminated to communities of interest?**

Not Applicable during this reporting period.

**e) What do you plan to do during the next reporting period to accomplish the goals?**

During the next reporting period, GSI will perform the following activities:

- Finalize sampling protocols
- Conduct TASC calls
- Prepare for field activities
- Initiate field sampling activities (Field-wide Leak Detection and Measurement, Event 1)

**3) PRODUCTS: Mandatory**

**a) Publications, conference papers, and presentations**

**i) Journal publications.**

Not Applicable during this reporting period.

**ii) Books or other non-periodical, one-time publications.**

Not Applicable during this reporting period.

**iii) Other publications, conference papers and presentations.**

Not Applicable during this reporting period.

**b) Website(s) or other Internet site(s)**

Not Applicable during this reporting period.

**c) Technologies or techniques**

Not Applicable during this reporting period.

**d) Inventions, patent applications, and/or licenses**

Not Applicable during this reporting period.

**e) Other products**

Not Applicable during this reporting period.

**4) PARTICIPANTS & OTHER COLLABORATING ORGNIZATIONS: Optional**

**a) What individuals have worked on the project?**

**Name:** Richard L. Bowers

**Project Role:** co-Principal Investigator

**Nearest person month worked:** 2

**Contribution to the Project:** Developed project deliverables and coordinated field activities with project partners.

**Funding Support:** None

**Collaborated with individual in foreign country:** No

**Travelled to foreign country:** No

**b) What other organizations have been involved as partners?**

**Organization Name:** Utah State University

**Location of Organization:** Vernal, Utah

**Partner's contribution to the project:** Subcontractor leading effort to collect gas emission samples during field trials.

**Financial support:** None

**In-kind support:** None

**Facilities:** Labs at Bingham Research Center, Utah State University, Vernal, UT

**Collaborative research:** None

**Personnel exchanges:** None

**More detail on partner and contribution:** None

**Organization Name:** Houston Advanced Research Center (HARC)  
**Location of Organization:** The Woodlands, Texas  
**Partner's contribution to the project:** Assisted with efforts to coordinate TASC participation.  
**Financial support:** None  
**In-kind support:** None  
**Facilities:** HARC Labs in the Woodlands, Texas  
**Collaborative research:** None  
**Personnel exchanges:** None  
**More detail on partner and contribution:** None

**Organization Name:** Colorado State University  
**Location of Organization:** Fort Collins, Colorado  
**Partner's contribution to the project:** Subcontractor assisting in effort to design underground sensor network for high resolution leak monitoring.  
**Financial support:** None  
**In-kind support:** None  
**Facilities:** CSU Labs in Fort Collins, Colorado  
**Collaborative research:** None  
**Personnel exchanges:** None  
**More detail on partner and contribution:** None

- c) **Have other collaborators or contacts been involved?**  
Not Applicable during this reporting period.

**5) IMPACT: Optional**

- a) **What is the impact on the development of the principal discipline(s) of the project?**

Not applicable during this reporting period.

- b) **What is the impact on other disciplines?**

Not applicable during this reporting period.

- c) **What is the impact on the development of human resources?**

Not applicable during this reporting period.

- d) **What is the impact on physical, institutional, and information resources that form infrastructure?**

Not applicable during this reporting period.

- e) **What is the impact on technology transfer?**

Not applicable during this reporting period.

**f) What is the impact on society beyond science and technology?**

Not applicable during this reporting period.

**g) What dollar amount of the award's budget is being spent in foreign country(ies)?**

None, \$0.00.

**6) CHANGES/PROBLEMS: Mandatory**

**a) Changes in approach and reasons for change**

Not applicable during this reporting period.

**b) Actual or anticipated problems or delays and actions or plans to resolve them**

Not applicable during this reporting period.

**c) Changes that have a significant impact on expenditures**

Not applicable during this reporting period.

**d) Significant changes in use or care of human subjects, vertebrate animals, and/or Biohazards**

Not Applicable to this Award.

**e) Change of primary performance site location from that originally proposed**

Not applicable during this reporting period.

**7) SPECIAL REPORTING REQUIREMENTS: Mandatory**

Not applicable during this reporting period.

**8) BUDGETARY INFORMATION: Mandatory**

Per the request of the DOE NETL project manager, graphs depicting the status of the budgeted versus cumulative costs of the overall project, technical transfer and cost share are included below. In addition, a Cost Status Report is included in the attached Excel spreadsheet.

