Quality Assurance Project Plan
Wisconsin Department of Natural Resources

Improved Environmental Results and Increased Regulatory Flexibility in Air Permitting for the Printing Sector Using Environmental Management Systems and an Environmental Results Program

EPA Grant Funding Source:
State Innovation Grant

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Approvals: **Date:**

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Distribution List

Each person listed below will receive a copy of this Quality Assurance Project Plan (QAPP) and any revisions. Individuals taking part in the project may request additional copies of the QAPP from these individuals.

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Executive Summary

The Wisconsin Department of Natural Resources (WDNR) is initiating a pilot project that would assess both Environmental Management Systems (EMS) and an Environmental Results Program (ERP) as alternative regulatory tools for Wisconsin's printing industry. The project is being conducted in partnership with the Wisconsin Department of Commerce Small Business Assistance Program (WDCOMM). That agency will develop an ERP for small printers with a goal of improving compliance with air, waste and water regulations. For larger printing facilities, those requiring Title V operation permits, WDNR is seeking to achieve air emission reductions beyond regulatory requirements through the continuous quality improvement approach of an EMS based permit system.

In this pilot program, WDNR is interested in measuring whether these alternative regulatory approaches result in reductions of air pollutants greater than current requirements for EMS participants and improve compliance with environmental regulations for small printers participating in an ERP. There is also an interest in determining wither these approaches increase the efficiency for regulators and the agency in addressing environmental responsibilities.

This document has been prepared according to the United States Environmental Protection Agency publications *EPA Requirements for Quality Assurance Project Plans* dated March 2001 (QA/R-5) and *Guidance for Quality Assurance Project Plans* dated December 2002 (QA/G-5).

A. Project Organization

The WDNR Air Management Program is the lead organization with primary responsibility for project coordination and ensuring that data collection and evaluation meet quality assurance criteria. The key individuals involved in project implementation, their project role and organizational affiliation are depicted in **Table 1**. Following Table 1 is a list of the key individuals involved in project implementation and a summary of their responsibilities.

Table 1 - Project Implementation Personnel

Key Individuals	Project Role	Organization Affiliation
Jon Heinrich	Project Manager	WDNR
Kristen Hart	Principle Investigator - Title V EMS Permit	WDNR
Renee Lesjak Bashel	Principle Investigator - ERP	WDCOMM
Bob Eckdale	Quality Assurance Coordinator	WDNR
Contractor	Third Party Project Evaluation	To be determined

Project Manager, Jon Heinrich – WDNR Bureau of Air Management
Responsible for overall coordination of the project including developing, maintaining and amending the Quality Assurance Project Plan (QAPP) and providing quarterly and annual progress reports and a final project report to the USEPA.

Title V EMS Permit Principle Investigator Kristin Hart, WDNR Air Management Engineer – South Central Region
Leads the participant workgroup in completion of activities related to the performance-based Title V EMS permit component of the project. Responsible for establishing data requirements and ensuring that necessary data collection occurs to evaluate if objectives for the EMS permit pilot have been achieved.

ERP Principle Investigator, Renee Lesjak Bashel - Wisconsin Department of Commerce, Small Business Assistance Program

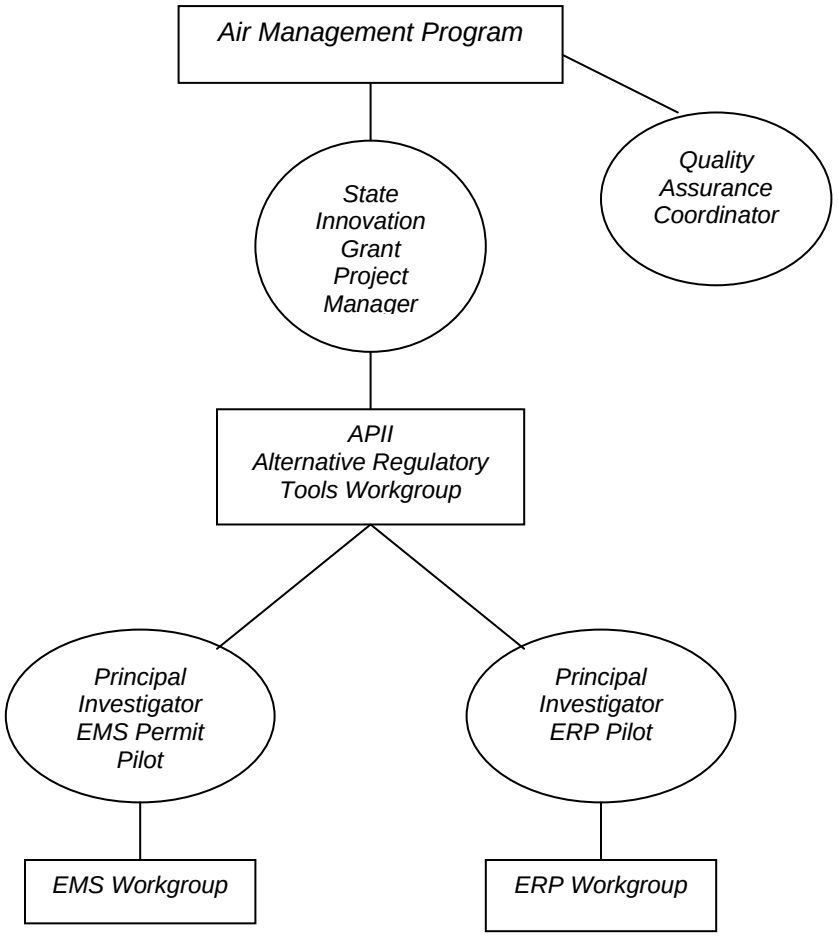
Leads the participant workgroup in completion of activities related to the performance-based Title V EMS permit component of the project. Responsible for establishing data requirements and ensuring that necessary data collection occurs to evaluate if objectives for the ERP pilot have been achieved.

Quality Assurance Coordinator, Bob Eckdale – WDNR Bureau of Air Management
The QA Coordinator will assist the Project Manager in meeting QAPP responsibilities as well as maintain QAPP documentation.

Project Evaluation Contractor - Not yet determined.
Contractor retained to perform an independent evaluation of project to determine if project objectives have been achieved.

Figure 1 is an organizational chart for the project.

Figure 1 – Project Organization Chart



In June 2003 the WDNR Bureau of Air Management began an extensive evaluation of its air permit program. The Air Permit Improvement Initiative, (APII), was established at that time to develop and implement ways to improve permit program efficiency and implementation while meeting the environmental protection needs of our citizens. In this initiative a number of workgroups have been formed to address different tasks. The *Alternative Regulatory Tools Workgroup* is the APII workgroup formed to investigate the efficiency and effectiveness of using alternative regulatory tools and approaches other than a traditional permit. This workgroup, which includes WDNR, the Wisconsin Department of Commerce (WDCOMM) Small Business Assistance Program, and industry, academic and environmental group representatives will guide the EMS and ERP pilot projects.

Specific participant working groups, one for the ERP development and one to develop a Title V EMS permit, will be formed to undertake the activities to pilot these alternative approaches for the printing sector in Wisconsin. The working groups would include WDCOMM, WDNR, interested printing facilities and other printing organizations and associations for this project.

Problem Definition/Background

This project will involve the development of the two alternative regulatory approaches for the printing industry of Wisconsin, a Title V EMS permit and ERP. Development of these approaches is an important component of an overall framework WDNR has established to make changes in the air permit program.

The WDNR has completed an initial assessment of the permit program changes that are needed including implementing required statutory changes. From this assessment the following framework for permit streamlining was established:

- Expand permit exemptions.
- Develop standard permits, including registration and general permits.
- Develop permits with emission caps that allow for operational flexibility.
- Explore alternative regulatory approaches, including environmental results programs and environmental management system based permits.
- Streamline major source permits while meeting federal Clean Air Act requirements.
- Reduce the need to obtain construction permits.

In the past two-year period there has been significant interest and activity in Wisconsin to streamline the air permit process. Statutory changes to Wisconsin's air permit program in 2003 Wisconsin Act 118 require WDNR to streamline through expanded permit exemptions, registration and general permits, and consolidation of construction and operation permits. In advance of statutory changes WDNR had commenced an extensive an evaluation of its air permit program. These actions had been initiated due to concerns over the amount of effort and time involved in air permitting as well as reservations about the value of this activity in achieving environmental improvement. Also, like many state and local environmental agencies, resources at WDNR are declining and this trend is likely to continue for the foreseeable future. There is also a strong industry interest in having WDNR adopt a more comprehensive approach to environmental regulation.

Project Objectives

Outlined below are the overall objectives we are planning to achieve in each year of the three-year project for each component of the project. This QAPP was developed to guide the development of data elements and related performance measures that will determine if project objectives have been achieved. The project needs to be initiated to complete this task and is one of the initial activities scheduled. A revised QAPP will be prepared before data collection begins that will include identification of the data elements and performance measurements for the project.

It is anticipated that most measurements will be done through existing databases ~~and through customer satisfaction surveys~~. The amendment to the QAPP will ensure that the quality objectives for project performance measures are appropriate for the regulatory and non-regulatory decisions to be made based upon those measures. This determination will take into account both the best practices for similar projects and the resources available for this project.

For the EMS permit component an important consideration is the selection of a control group of reference facilities to provide comparative data to measure certain project objectives. The revised QAPP will also include selection criteria for the reference facilities. In general, reference facilities will include similar Title V sources. To ensure a representative comparison, air pollutant emissions data for pilot facilities and reference facilities will be normalized to account for changes in production from year to year.

Environmental Management System Permit

The principle objective is to determine if a comprehensive, well-maintained Title V EMS permit with performance based legal requirements can substantially reduce pollution from a facility and yield significant administrative savings for facilities and WDNR while improving meaningful public participation in the process. Outlined below are the objectives we are planning to achieve in each year of the three-year project.

Year 1

- Select data that can establish that a performance-based Title V permit incorporating EMS elements can meet all the requirements of Part 70.
- Establish a set of required elements of an EMS that includes a systematic method for evaluation of the EMS.
- Establish reduction goals for volatile organic compound (VOC) emissions and hazardous air pollutant emissions (HAP) as well as reduction goals for discharges in other media for pilot facilities.
- Establish a cross-media plan and reduction goals
- Develop an efficient and effective process to establish a performance-based permit that uses the capacity of an EMS.
- Establish stakeholder roles in the performance-based Title V permit process.
- Develop a comprehensive compliance strategy for a performance-based permit.
- Begin drafting performance-based Title V permits for pilot facilities.

Year 2

- Issue performance-based Title V permits to pilot facilities.
- Begin collection of data to compare a performance-based Title V permit with a traditional Title V permit.
- Gain acceptance by the USEPA of a permit that uses the structure of an EMS to hold the requirements of a performance-based Title V permit.
- Measure a reduction in volatile organic compound (VOC) emissions.
- Measure a reduction in hazardous air pollutant emissions (HAP).
- Measure reductions in pollutants in other media in addition to air that were established as priorities during the cross media planning step.
- Measure a reduction in time WDNR needs to review construction permit applications and revisions from participating facilities.
- Survey the public to establish their satisfaction.
- Cultivate interest from other printing facilities and facilities in other business sectors in pursuing performance-based Title V EMS permits.

Year 3 and Beyond

- Air emission reductions reduce the public's exposure to HAP and help improve air quality in ozone nonattainment areas.
- Attain and maintain environmental standards for other media established as priorities during the multimedia-planning step.
- Reduce administrative time for WDNR staff.
- Reduce administrative time for facilities in meeting regulatory obligations.
- Increased use of innovative pollution reduction methods.
- Establishment of lasting and meaningful partnerships between interested public and participating facilities.
- Use of performance-based Title V permits by other sectors.
- Transfer knowledge gained and share pilot program experience with others.

Environmental Results Program

The principal goal is to develop an ERP for smaller printers in Wisconsin. While the level for "smaller" printers has yet to be defined, the program will not include facilities that require a Title V operation permit. It is anticipated that the ERP pilot will consider inclusion of the entire range of printing operations found in the state e.g. screen, digital, letterpress, lithographic, flexographic, and rotogravure. Through an ERP designed for small printers the objective is to improve compliance with applicable air, waste and water requirements.

Year 1

- Workbook and compliance checklist developed.
- Printing facility owners and operators attend ERP workshops.
- Owners and operators gain an understanding of their environmental responsibilities and request compliance assistance where understanding is incomplete.
- WDNR inspector training is conducted and performance baseline data is collected.

Year 2

- Printing facility owners and operators are trained on the use of the ERP workbook and submit timely self-inspection reports using the workbook and inspection checklist.
- Owners and operators improve their compliance with the requirements that apply to them. This results in:
  - Increased use of lower VOC and HAP coatings.
  - Improvement in the compliance rate with hazardous waste storage and disposal requirements is measured.
  - Improved management of clean-up solvents and waste.
- ERP program outreach is conducted and other businesses express interest in ERP development for their sectors.

Year 3 and Beyond

- Air emission reductions reduce the public's exposure to HAP and help improve air quality in ozone nonattainment areas.
- Printer facility owners and operators will make progress on additional EBPI's, such as pollution prevention and best management practices that are established as part of a continuous improvement cycle.
- Printing facility owners and operators will make informed decisions regarding their impact on environment.
- Overall environmental performance for the printing sector is documented to have improved through the implementation of an ERP.
- Printer facility owners and operators achieve equal or better environmental results, increase cost effectiveness and decrease in costs through ERP implementation.
- WDNR spends less time processing compliance data since all media managed through one program.

Project/Task Description and Schedule

The project will begin in April of 2005 and continue for 3 years. The first year will be spent in program development including educational efforts for WDNR personnel, the environmental community, and the business community. The second and third years will be spent running the program, learning how to bring new facilities in, troubleshooting and making improvements. More education will be needed for all stakeholders, internal and external. By the second half of the third year an outside agency will be retained to conduct an independent program evaluation. Final evaluation will be completed by March

2008. Also in the third year WDNR will begin looking at how the project can be extended to other industry sectors. The table below outlines the anticipated quarterly milestones to be achieved during the three-year project.

Table 2 – Task Schedule

	PERFORMANCE-BASED EMS PERMIT MILESTONES	ENVIRONMENTAL RESULTS PROGRAM MILESTONES
July 2005	Select participating facilities Gather baseline data Establish interested parties group Establish multi-media team	Develop performance indicators Identify universe of sources Gather data on administrative effort for current compliance or permit activities
October 2005	Provide training on EMS to WDNR staff Provide training for interested parties group and facilities on roles and responsibilities	Develop workbook and inspection checklists Database development Develop statistical methodology
January 2006	For participating facilities establish environmental goals and measures	Conduct inspector training
April 2006	Evaluate and revise QAPP and Workplan Establish compliance methodology	Evaluate and revise QAPP and Workplan Perform baseline inspections
July 2006	Obtain data on satisfaction with new public participation process Initiate development of draft permits Identify multimedia impacts	Analyze data and revise workbooks and inspection checklists
October 2006	Issue performance-based permits Evaluate the permit review process	Prepare and provide technical assistance workshops
January 2007		Facilities conduct inspections and submit self-certification Conduct State-to-state ERP Collaboration
April 2007	Collect first round of data for pilot and control facilities and complete an initial evaluation of the EMS permit approach	Evaluate self-certifications and implement targeted follow-up activities including response to RTC plans
July 2007		Perform post certification inspections
October 2007	Collect second round of data for participating and control facilities	Prepare evaluation that compares data from post-inspections to pre-inspections and self-certifications concerning performance goals – make revisions to targeted issues and other materials as needed
January 2008	Independent project evaluation is completed.	
March 2008	Complete and submit case study report including summary of project, reductions achieved, cost analysis, problems and lessons learned.	

Special Equipment or Supplies

For ERP WDNR inspectors will use tablet personal computers to collect data during baseline and post-certification inspections.

Personnel, Special Training Requirements or Certifications

The Project Manager is responsible for ensuring that all personnel involved with data generation (including state personnel, contractors, and partners) have the necessary QA training to successfully complete their tasks and functions. The Project Manager will document attendance at all training

sessions. The Project Manager is also responsible for providing all participating facilities with clear written instructions on how to prepare and submit data.

For the ERP component specialized training will be provided to the following:

- WDNR inspectors who will be collecting baseline and post-certification data.
- Individuals who will be compiling the database containing the universe of facilities.
- Data-entry personnel who will be processing data from inspections and self-certification responses.
- QA/QC personnel (if any additional training is needed to familiarize them with the project).

Documentation and Records

The format for all data reporting will be consistent with the requirements and procedures used for data validation and data assessment described in this QAPP. The recording media for the project will be both paper and electronic. The project will implement proper document control procedures for both. For instance, hand-recorded data records will be taken with indelible ink, and changes to such data records will be made by drawing a single line through the error with an initial by the responsible person. The Project Manager will have ultimate responsibility for any and all changes to records and documents. Similar controls will be put in place for electronic records.

The Data Quality Assurance Coordinator shall retain all updated versions of the QAPP and be responsible for distribution of the current version of the QAPP. The Quality Assurance Coordinator and the Project Manager will approve updates. The Project Manager shall retain copies of all management reports, memoranda, and all correspondence between the WDNR and all project personnel identified in **Table 1**.

Additional records and documents that will be produced in conjunction with this project include:

- Inspection checklists and reports
- Self-certification forms
- Return-to-compliance forms
- Non-applicability forms
- Enforcement documentation
- Facility outreach materials, including workbook, fact sheets, brochures, etc.
- Amended QAPP
- Readiness reviews
- Data handling reports
- Quarterly and annual progress reports to EPA
- Project final report (to include discussion of QA issues encountered, and how they were resolved)
- Photographs
- EMS Permits
- Public involvement plans
- Cross-media plans

Files, paper records, and other media will be maintained at WDNR for a period of three years after the completion of the grant. After that time, some records will be moved to the Wisconsin State Records Center. Electronic files will be maintained for a minimum of three years after completion of the grant. Electronic files will be maintained on the WDNR network servers and will also be periodically backed up by the Project Manager.

B. Measurement/Data Acquisition

Sample Process Design (Experimental Design)

A key task for the ERP is the development of a sound statistical methodology for collecting and analyzing facility data, in order to draw inferences related to the selected performance measures. While the precise

methods are not known at this point, they are expected to be built upon the EPA's *Generic Guide to Statistical Aspects of Developing and Environmental Results Program* (2003). The major quality objective will be to collect representative data, including data from self-certification forms, return-to-compliance forms, and non-applicability forms that truly reflect the conditions of the universe of facilities in the ERP. Facility data is of two types:

(1) Inspection data, which will be collected by trained WDNR inspectors from randomly sampled facilities, and
(2) Self-certification data, which will be collected from facilities through a mail or electronic-submittal survey process.

For the EMS permit an important consideration is the selection of a control group of reference facilities to provide comparative data to measure certain project objectives.

This section of the QAPP will be amended upon completion of the project-specific statistical methodology and establishment of the selection criteria.

Sampling Method Requirements

All data collection instruments will be subject to multiple rounds of review by relevant stakeholders to ensure the collection of high-quality and representative data.

As described above, the primary data collected and used for the ERP will come from a survey data collection process. This section of the QAPP will be amended upon completion of the project-specific statistical methodology, which will detail the statistical sampling methods to be used. As mentioned elsewhere, that methodology will be prepared consistent with the principles identified in the EPA's *Generic Guide to Statistical Aspects of Developing an Environmental Results Program* (2003).

Sample Handling and Custody Requirements

Upon completion of the ERP inspection checklists, inspectors will sign the checklists and enter data into an electronic database. Inspectors will be issued procedural guidelines for data input. Facilities will mail or submit electronically signed forms into WDNR, where data-entry staff will input hard copy data into the electronic database. Procedures for entering hand-written data into the database will follow standard quality assurance procedures (e.g., 100% verification using independent double key entry.) Detailed quality assurance procedures for data entry and acceptance will be prepared during the development and implementation of a data management strategy. The revised QAPP will reflect the strategy.

Chain of custody is not relevant to this project.

Analytical Requirements

No physical tests or chemical analyses are anticipated for this project. For the ERP, this project will follow recognized statistical analytical methods for survey samples and this section will be amended upon completion of the detailed statistical methodology.

Data Acquisition Requirements (Non-direct Measurements)

This project will rely upon secondary data including computer databases and historical records. The project will not involve scientific instruments and equipment.

Quality Control Requirements

The Project Manager and Quality Assurance Coordinator will assess data quality including the following aspects:

- Completeness
- Appropriateness

- Accuracy
- Precision
- Relevance
- Comparability

For the ERP the following specific steps to measure/estimate the effect of data errors. Primary data collection forms will be designed in such a way to allow internal cross-checking of data by comparing answers of different questions to each other, and such cross-checking will be automatic for electronically entered data. Further, post-certification inspections will offer the opportunity to compare inspection results with self-certification results, if the facilities sampled have submitted self-certification forms.

Procedures for handling data anomalies (such as outliers and missing data) will be handled based on guidance prepared in the project-specific statistical methodology. The quality control statistics to be used in this project are described in more detail in **Section D**.

Data Management

WDNR will develop a data management strategy, and amend the QAPP based upon the strategy. The Project Manager is responsible for ensuring that that strategy is developed and that the QAPP is amended. Once amended, this QAPP section on data management will provide information on the following issues:

- Data management scheme, from field to final use and storage.
- Standard recordkeeping and tracking practices, and document control system (citing relevant agency documentation).
- Data handling equipment/procedures that will be used to process, compile, analyze, and transmit data reliably and accurately.
- Individuals responsible for elements of the data management scheme.
- Process for data archival and retrieval.

C. Assessment/Oversight

Assessments and Response Actions

The Quality Assurance Officer will conduct a *Readiness Review* immediately prior to significant data collection activities. The QA Officer will report findings to the Project Manager, who will take corrective action (if any is necessary) before the data collection task begins. Further, the Project Manager and QA Officer will thoroughly debrief project implementation staff a short time after beginning their respective implementation tasks, to identify emerging/unanticipated problems and take corrective action, if necessary. For the ERP the Quality Assurance Officer will conduct a *Readiness Review* immediately prior to the five major data collection tasks: identifying targeted facilities, baseline inspections, self-certification, targeted follow-up, and post-certification inspections.

Reports to Management

Three kinds of reports will be prepared: readiness reviews (described above), regular quarterly and annual progress reports, and project final report. Progress reports will note the status of project activities and identify whether any QA problems were encountered (and, if so, how they were handled). Project final report will analyze and interpret data, present observations, draw conclusions, identify data gaps, and describe any limitations in the way the data should be used.

Table 3 - Project QA Reports

Type of Report	Frequency	Prepared By	Recipients
Amended QAPP	Before primary data	Project Manager	All recipients of original

Type of Report	Frequency	Prepared By	Recipients
	collection begins.		QAPP
Readiness Review	Before each major data collection task.	Quality Assurance Coordinator	Project Manager and Principle Investigator
Progress Report	Quarterly	Project Manager and Principle Investigators	USEPA Project Officer (Copying USEPA OPEI)
Progress Report	Annually	Project Manager and Principle Investigators	USEPA Project Officer (Copying USEPA OPEI)
Final Project Report	Once	Project Manager and Principle Investigators	USEPA Project Officer (Copying USEPA OPEI)

D. Data Validation and Usability

Data Review, Validation, or Verification

This QAPP and its subsequent amendments shall govern the operation of the project at all times. Each responsible party listed in *Section A - Project Organization* shall adhere to the procedural requirements of the QAPP and ensure that subordinate personnel do likewise.

This QAPP shall be reviewed at least annually to ensure that the project will achieve all intended purposes. All the responsible persons listed in *Section A - Project Organization* shall participate in the review of the QAPP. The Project Manager and the Quality Assurance Officer are responsible for determining that data are of adequate quality to support this project. The project will be modified as directed by the Project Manager. The Project Manager shall be responsible for the implementation of changes to the project and shall document the effective date of all changes made.

It is expected that from time to time ongoing and perhaps unexpected changes will need to be made to the project. The Project Manager shall authorize all changes or deviations in the operation of the project. Any significant changes will be noted in the next report to EPA, and shall be considered an amendment to the QAPP. All verification and validation methods will be noted in the analysis provided in the final project report.

Verification and Validation Methods

To confirm that QA/QC steps have been handled in accordance with the QAPP, a readiness review will be conducted before key data collection/analysis steps, and data handling reports will be prepared after each step. For the ERP, standard statistical tests (described below in *Reconciliation of Data Quality Objectives*) will be used to determine the extent to which inferences can be drawn from the sample data.

Reconciliation with Data Quality Objectives

This data quality assessment section will be amended after all project data elements have been identified and before data collection begins.

For the ERP this section will be written and finalized after completion of the project-specific statistical methodology identified in EPA's *Generic Guide to Statistical Aspects of Developing an Environmental Results Program* (2003). This section will present the following information:

- Meeting and reporting needs of your project - This section shall contain a description of how the results of the study will be analyzed and evaluated to determine whether the needs of the project were met and then reported.
- Mathematical and statistical formulae - This section shall contain details of formulae that will be used to calculate precision, accuracy/bias, completeness, comparability and sensitivity (if applicable) of the project data.

- Approach to managing unusable data - This section shall contain a description of what will happen if data are not useable and how that will impact project evaluation.