Rhode Island Department of Environmental Management

MS4 Construction Site Runoff Control Environmental Results Program

Quality Assurance Project Plan
March 11, 2008

Rhode Island Department of Environmental Management (DEM)
Office of Technical and Customer Assistance (OTCA)
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A PROJECT MANAGEMENT

A1. Approval Sheet

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RI Department of Environmental Management
Office of Technical & Customer Assistance
Principal Environmental Planner
Project Manager

3/11/2008
Date

Thomas Getz
RI Department of Environmental Management
Quality Assurance Manager

March 11, 2008
Date

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Environmental Protection Agency, Region 1
QA Chemist

03-28-08
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A3. Distribution List

Each person listed on the approval sheet and each person listed under Project/Task Organization will receive a copy of this Quality Assurance Project Plan (QAPP). Individuals taking part in the project may request additional copies of the QAPP from personnel listed under Section A4.

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

A4. Project/Task Organization

Personnel involved in project implementation are listed in Table 1, and shown as an organization chart in Figure 1.

Table 1: Auto Salvage ERP Project Implementation Personnel

Individual	Role in Project	Organizational Affiliation
Ronald N. Gagnon, P.E.	Project Manager	RIDEM - OTCA
Thomas Getz	QA Manager	RIDEM – Assistant to the Director
Eric Beck, P.E.	Project design & implementation tasks	RIDEM – RIPDES Supervising Engineer
Margarita Chatterton	Research, project design and implementation tasks	RIDEM – RIPDES Senior Environmental Engineer
Eugene Park, Ph.D.	Research, project design and implementation tasks	URI Center for Pollution Prevention & Environmental Health

The Rhode Island Department of Environmental Management Assistant to the Director will be responsible for the following activities:

- Coordinate and conduct outreach with regulated industry and internal/external stakeholders
- Coordinate major project tasks with other project staff as outlined in the Project Work Plan, including project planning & design, surveys and audits (including baseline and post-certification audits), presenting workshop(s) for facility operators, and preparation and review of documents, project reports
- Carry out duties in areas outlined above as a project staff member
- Maintain official, approved QAPP
- Develop amended QAPP and submit for approval
- Issue quarterly and annual reports to U.S. EPA

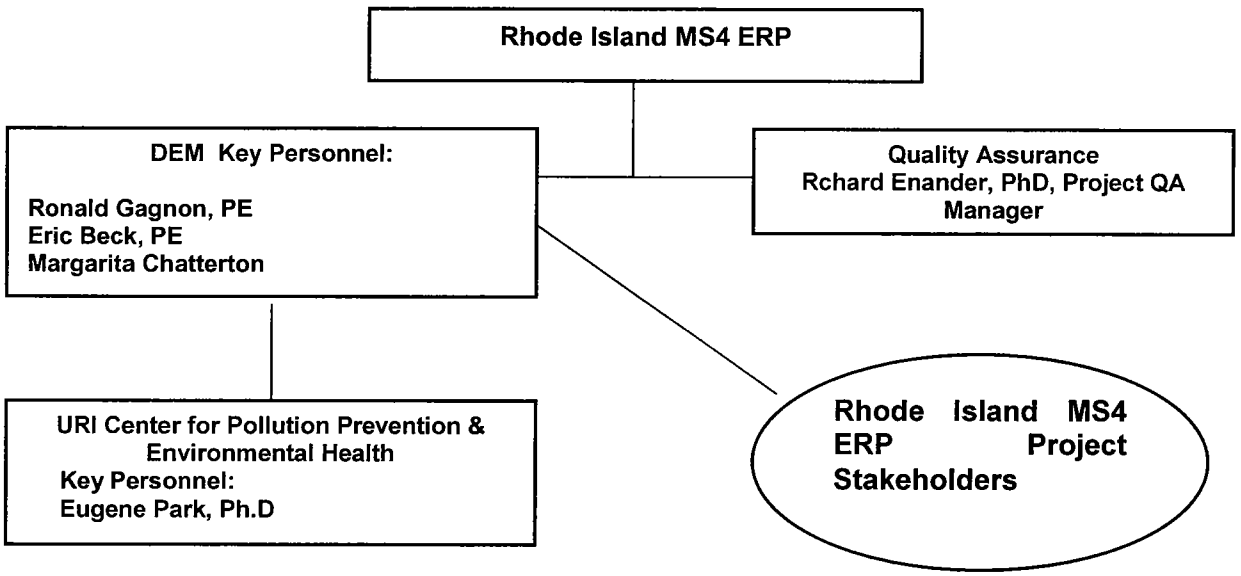
University of Rhode Island's Center for Pollution Prevention and Environmental Health will be a major partner in this project. Eugene Park, Ph.D. will be the key staff member participating.

URI's Center for Pollution Prevention & Environmental Health will be responsible to assist the project for the following activities:

- Assist in project scoping and design
- Assist in pre-certifications survey design, implementation, tabulating results
- Participate as an active member in the stakeholder process
- Assist in preparation of certification documents and materials
- Assist in presenting workshop(s) for MS4 inspectors
- Assist with carrying out baseline and post-certification site audits

The participating MS4s will be responsible for submitting self-certification materials and, if applicable, returning to compliance.

Figure 1: Project Organizational Chart



A4a. Quality Management Plan (QMP)

The Rhode Island Department of Environmental Management has an approved Quality Management Plan (QMP), dated December 3, 2007. This Quality Assurance Project Plan is consistent with that plan.

A5. Problem Definition/Background

Rationale for initiating the project.

This proposal will address the specific problem of noncompliance with the requirements of the Rhode Island General Permit for Stormwater Associated with Construction Activity and local erosion and sediment control ordinances. The

Stormwater Phase II Final Rule for Construction Site Runoff Control Minimum Control Measure (Specific link to EPA's Strategic Goal 2 – Clean and Safe Water) requires municipalities to develop Qualified Local Programs (QLPs) and perform inspections of 100% of constructions activities greater than one acre within their jurisdiction. Diminishing resources at the federal, state and local levels is making it much more difficult for MS4 operators to implement compliance and inspection programs. This project will develop an ERP model as a means of satisfying the small MS4 General Permit requirements.

Objectives of the project.

The project will be used to determine if implementation of the ERP, with its certification by MS4 inspectors, provides better environmental compliance with the construction site Runoff control minimum control measure than the existing regulatory enforcement framework. Thus, it will produce an environmental improvement by reducing the amount of pollutants (sediment, soil, etc.) being introduced into the environment. Specific performance measures will be developed and adopted through the stakeholder process. A fundamental part of the process will be the compilation of pre-certification data gained through the baseline audits.

Just before this statewide project is formally launched, industry baseline conditions will be assessed using a comprehensive compliance and pollution prevention certification checklist. Checklist questions will be developed in consultation with regulatory divisions, represented as first phase stakeholders, and will address all relevant runoff control measure regulatory requirements, as well as assess pollution prevention opportunities. The actual number of facilities to be targeted for baseline audits will be statistically determined and locations randomly selected.

Performance measures will be developed as necessary and used through the project period. Any changes will be provided in an amendment to the Project Work Plan. Proposed performance measures for the project at this time include:

- Number of MS4 sites participating in this voluntary initiative.
- Implementation of an industry-wide survey
- Development of effective EBPI's for the project.
- Development of Workbook, Checklist, fact sheets, brochure
- Results of post certification analysis, especially improvements in comparison of baseline vs. post-certification compliance
  Number of informational requests about the project from MS4 inspectors, municipal officials or agencies, press contacts, environmental or trade organizations
- Number of requests for compliance assistance from participants

Among expected intermediate and longer term outcomes of the project include:

- Increased awareness and knowledge by MS4 inspectors of environmental regulatory requirements and compliance and management issues as a result of project

documents that are easy to read and understand, workshops, and compliance assistance provided through the project.

- Improvements in environmental performance as indicated through tracking EBPI's identified for the project.
- Information and "lessons learned" in the project will be applied to future iterations of the workbook, checklist, and overall program structure.
- Increasing improvements in environmental performance over time as the industry gains experience working with DEM-OTCA, and by using self-educational tools commonly and successfully employed in Environmental Results Programs.
    - It is anticipated that mandatory self-certification will be conducted for every regulated site, and that performance measurement statistics will track all future progress.

The proposed list of performance measures and outcomes is subject to modification, based on discussion, findings, and action in the first phase stakeholder process, and will include development of a logic model. Any changes will be provided in amendments to the Project Work Plan and the Quality Assurance Project Plan (QAPP).

Regulatory information, applicable criteria and action limits.

This project will address the specific problem of noncompliance with the requirements of the Rhode Island General Permit for Stormwater Associated with Construction Activity and local erosion and sediment control ordinances. The Stormwater Phase II Final Rule for Construction Site Runoff Control Minimum Control Measure (Specific link to EPA's Strategic Goal 2 – Clean and Safe Water) requires municipalities to develop Qualified Local Programs (QLPs) and perform inspections of 100% of constructions activities greater than one acre within their jurisdiction. Diminishing resources at the federal, state and local levels is making it much more difficult for MS4 operators to implement compliance and inspection programs. This project will develop an ERP model as a means of satisfying the small MS4 General Permit requirements. The ERP approach will allow the DEM and the MS4 operators to work together to conduct a significant number of inspections (currently under state rule all construction sites must be inspected, the self-certification will be used to meet this requirement) to measure compliance with the selected EBPIs, target compliance actions that will achieve maximum benefit, respond more efficiently to public complaints and concerns, and develop reports that indicate documented improvements with (or troubles with) compliance. This strategic innovation will enable a more efficient use of limited resources and produce measurable environmental results.

A6. Project/Task Description

Project overview.

This project will allow the Rhode Island Department of Environmental Management, hereinafter referred to as RIDEM, to explore whether an approach modeled upon the Environmental Results Program (ERP) can help achieve these goals, while improving regulatory cost-effectiveness. The Environmental Results Program (ERP) is an innovative approach to solving high-priority environmental problems in industry sectors largely comprised of small businesses. The ERP

concept combines technical assistance, self-certification, inspections, and statistically based performance measurement in order to reduce environmental impacts of business.

The promise of ERP is that it will cost-effectively reduce environmental impacts of small businesses that may present a substantial cumulative environmental risk. Businesses targeted so far by ERP include gas stations, auto salvage yards, auto body and mechanical repair shops, dry cleaners, and printers. ERP can help environmental agencies identify previously unknown facilities, measure performance, increase regulatory efficiency, and help improve overall environmental performance. ERP is in part designed to help facilities that want to comply but don't understand their requirements, and evidence suggests that ERP can motivate firms to comprehensively review their environmental performance and take needed action to come into compliance and adopt best practices.

Project summary and work schedule.
This project's major tasks and timeline are outlined in the table below.

Table 2: Schedule of major project tasks

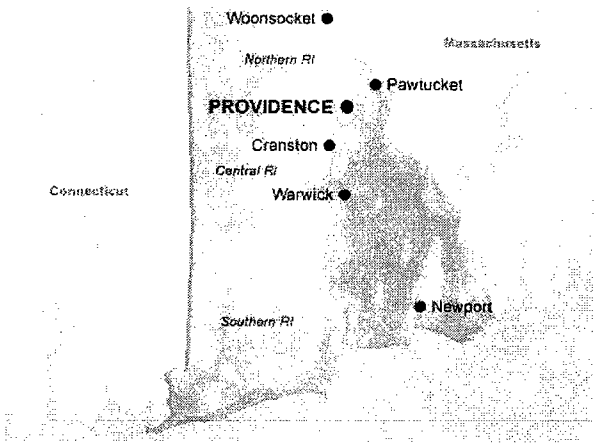
Task Name	Task Description	Start Date	End Date
Develop Compliance Check List	DEM, working with the University of Rhode Island, will develop a compliance check list based on the General Permit conditions for the use of BMPs to control erosion and sedimentation along with other requirements of the General Permit. The Check List will be modeled on the check lists successfully developed by this partnership for the Auto Body and Auto Salvage sectors. The check list will include a self-certification requirement for the General Permit notifiers.	10/07	3/08
Develop and submit QAPP	DEM and URI will work together to prepare the QAPP to ensure that data is properly collected and assessed. The QAPP will include a description of how the number of random inspections for baseline and post certification conditions is calculated.	10/07	12/07
Complete QAPP Revisions	DEM will revise QAPP based on comments received from EPA review	1/08	2/08
Develop Statistical Methodology	DEM will develop the statistical methodology to compare baseline inspection results to the post certification random inspection results, based on previous ERP sectors.	5/08	1/10
Develop Data Management Strategy	The RIPDES MIS staff will be engaged to develop a data management strategy to receive, store and analyze inspection data.	1/08	10/08
Estimate Universe	DEM will estimate the number of projects that will be regulated under this program by reviewing the number of Notifications of Intent received for coverage under the General Permit, on an annual basis, for the last three calendar years.	4/08	5/08
Determine	Use the EPA ERP Results Analyzer to determine the number of random, baseline inspections needed to perform	5/08	6/08

Baseline Sample	future EBPI measurements.		
Conduct Base Line Inspections	Random, base line inspections will be performed by the DEM/URI partnership to determine compliance status with the check list parameters. A specific number of EBPIs will be selected based on the EPA Measurable Goals Guidance for Phase II Small MS4s and the results of the base line inspections.	5/05	10/08
Develop Stakeholder Group	DEM and URI will solicit a number of past Notifiers, contractors, consultants, representatives from non-governmental organizations, and other interested parties for interest in joining a stakeholder group to review, comment, and advise on issues concerning this program. One stakeholder group meeting will be held to discuss the draft check list. The remaining meetings will be held after baseline inspections are completed to ensure that no bias is introduced. We would schedule from two to four meetings throughout the development of the project to discuss specific milestones such, base line results, training programs, and inspection and enforcement strategies. Industry.	5/08	7/09
Develop Training Work Shops	DEM and URI will develop a training program for past and prospective Notifiers, Storm Water Coordinators and industry representatives that would be subject to the self-certification inspection and the conducting of random and targeted inspections. The training will focus on how to conduct a self-inspection or random/targeted inspection using the check list, correct any deficiencies, use of the Return-to-Compliance forms, and other factors important to maintain compliance with the General Permit. The training will build on current programs for BMP design and implementation and the training under development by the collaborative arrangement among URI, DEM and the Department of Transportation to provide training and information tailored to municipalities. The training will be coordinated so that the URI, DOT collaborative will focus on training municipalities and the ERP training will focus on industry.	10/08	1/09
Distribute Self-Certifications	DEM will distribute the final Check List with certification statements to all persons that submit a Notice of Intent for coverage under the General Permit. DEM will also provide check lists and certification statements to the Storm Water Coordinators for distribution to Notifiers in their respective MS4s. DEM will offer technical assistance in the form of phone call consultations, email questions on an as needed basis during this time period. DEM will investigate and develop cost estimates to establish a centralized data base for the electronic submission of all inspection check lists (self –certifications, random inspections, targeted inspections by both DEM and Storm Water Coordinators)	2/09	7/09
Develop Inspection Strategy &	DEM will work with the Storm Water Coordinators to develop an inspection strategy to ensure good and consistent data collection based on the number of random inspections needed (using the EPA ERP Results Analyzer)	2/09	7/09

Conduct Training work Shops	to measure performance of the EBPIs. DEM and URI will conduct the training program after the Check Lists are distributed and the regulated community has had a chance to become familiar with the program through the public stake holder process		
Determine Number of Random Samples and Conduct Random and Targeted Post-certification Inspections	The EPA Results Analyzer will be used to determine the number of random samples. DEM and the Storm Water Coordinators will conduct the random inspections and a select number of targeted inspections using the check list. All data will be gathered by DEM for statistical analysis.	8/09	1/10
Develop compliance Policy for Enforcement	DEM and the Storm Water Coordinators will develop a compliance policy for enforcement to ensure that referrals are made using consistent information and actions are taken on a consistent basis. The policy will identify the coordination between local and state responsibilities.	11/09	1/10
Project Reports	Quarterly and Final Project Reports	1/08	9/10

Geographic focus.

The project will be implemented for the entire State of Rhode Island (Providence, Bristol, Newport, Kent, and Washington counties), in all 34 regulated MS4s.



Resource and time constraints.

The project schedule was developed such that tasks should be able to be accomplished as outlined in the Work Plan in the timelines stated, given current staffing and budgetary circumstances. Should any changes take place to affect that situation, the Work Plan and QAPP will be amended to reflect those changes.

A7. Quality Objectives and Criteria

Detailed performance measures.

This project is primarily interested in the following list of likely performance measures. Note that one of the tasks of this project involves revisiting and reaffirming/revising these draft performance measures. The final list will be submitted in a QAPP amendment. Proposed performance measures for the project at this time include:

- Number of construction sites participating in this initiative.
- Development of effective EBPI's for the project.
- Development of Workbook, Checklist, fact sheets, brochure
- Results of post certification analysis, especially improvements in comparison of baseline vs. post-certification compliance
- Number of informational requests about the project from MS4 inspectors/ operators, municipal officials or agencies, press contacts, environmental or trade organizations
- Number of requests for compliance assistance from participants

Quality objectives.
Quality objectives for these performance measures will be developed as part of the Measures Identification and Statistical Methodology tasks. Specific quality objectives for these measures as a group (and, if necessary, individually) will be provided in the anticipated revision to the QAPP.

The amendment to the QAPP will ensure that the quality objectives for these 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. In part, the Project Manager will rely upon EPA's *Generic Guide to Statistical Aspects of Developing an Environmental Results Program* (2003) for advice in making decisions related to the optimizing the following aspects of data quality for this project:

- Precision
- Bias
- Representativeness
- Completeness
- Comparability
- Sensitivity (if applicable)

A8. Special Training/Certification

The RIDEM and University of Rhode Island Center for Pollution Prevention and Environmental Health will develop and deliver mandatory and voluntary training sessions to key parties to ensure quality data collection, to the extent practicable.

Mandatory intensive in-person training sessions will be delivered to the following individuals to ensure quality data collection:

- inspectors who will be collecting baseline and post-certification data
- 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)
- Individuals who will be compiling the database containing the universe of facilities

Each session will cover proper data collection and QA procedures. Training will be augmented by debriefing personnel shortly after their tasks have begun, to correct and clarify appropriate practices.

Intensive in-person training sessions will be offered to the self-certifying contractors that install runoff controls. Contractors and inspectors will also be provided with clear written instructions on how to prepare and submit data, and they will be able to call a phone number to ask anonymous questions if they wish.

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 ensuring the self-certification materials sent to regulated sites clearly document how they should properly prepare and submit their data.

A9. Documents and Records

Report format/information.
The format for all data reporting packages will be consistent with the requirements and procedures used for data validation and data assessment described in this QAPP.

Document/record control.
The recording media for the project will be both paper and electronic, with photographs (Digital Photograph Record Collection and Storage SOP, SOP-OD-QM-4) also to be used. The project will implement proper document control procedures for both, consistent with RIDEM's Quality Management Plan. 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 RIDEM Quality Assurance Manager shall retain all updated versions of the QAPP and be responsible for distribution of the current version of the QAPP. The RIDEM Quality Assurance

Manager and the RIDEM Project Manager will approve annual updates. The Project Manager shall retain copies of all management reports, memoranda, and all correspondence between the Rhode Island Department of Environmental Management and all project personnel identified in A4.

Other records/documents.
Other 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 (see below)
- 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)

The QAPP amendment will include a copy of the project check list, documentation of the universe estimate and baseline inspection analysis, the statistical methodology, and the compliance policy for enforcement when they are completed.

Storage of project information.

Files, paper records, and other media such as photographs will be maintained in the DEM Office of Technical & Customer Assistance for a minimum of three (3) years after the completion of the grant on September 30, 2007. After such time, some records may be moved to the DEM Records Archives for storage. Electronic files shall be maintained for a minimum of three (3) years after the completion of the grant on September 30, 2010. As it is anticipated that the MS4 ERP will continue after the grant is completed, the time frames stated are the minimum and probably will be exceeded as the information will be needed for the ongoing program.

Backup of electronic files.

Electronic files will be maintained on the DEM network server, as well as periodically backed up locally by the project manager on CD's or zip disks. Also, as a normal procedure, files on the network server are backed up by the DEM MIS staff at the server location.

B DATA GENERATION AND ACQUISITION

B1. Sampling Process Design (Experimental Design)

A key task in this project will be to develop a sound statistical methodology for collecting and analyzing facility data, in order to draw inferences related to the selected performance measures. The major quality objective will be to collect representative data that truly reflect the conditions

of the universe of facilities that this ERP focuses on. Facility data is of two types: (1) inspection data, which will be collected by trained Rhode Island Department of Environmental Management inspectors from randomly sampled facilities, and (2) self-certification data[1], which will be collected from construction sites through a mail survey process. While the precise methods are not known at this point, they are expected to be built upon the advice given in EPA's *Generic Guide to Statistical Aspects of Developing and Environmental Results Program* (2003).

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

B2. Sampling Methods

As described above, the primary data collected and used by this 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).

Preparation of data collection instruments.

All data collection instruments will be subject to multiple rounds of review by relevant internal and external stakeholders to help assure the collection of high-quality and representative data. Data collection instruments will be prepared in accordance with the guidance on data collection instruments provided in EPA's *Generic Guide to Statistical Aspects of Developing an Environmental Results Program* (2003). Specifically, preparation will follow the checklist for data collection instruments provided in an appendix of that guide.

B3. Sample Handling and Custody

Upon completion of paper checklists used in baseline audits and post certification audits, inspectors will sign the checklists. Inspectors will enter data from paper checklists into the electronic database, or entered directly into a tablet PC for later download into the electronic database. Construction site inspectors will mail signed certification forms into RIDEM, where data-entry staff will input data into the electronic database.

Chain of custody is not relevant to this project.

Data entry QA procedures.

Procedures for entering hand-written data into the database will follow standard quality assurance procedures (e.g., 100% verification using independent double key entry), consistent with RIDEM's Quality Management Plan. Detailed quality assurance procedures for data entry and acceptance will be prepared during the development and implementation of a data management strategy. The final QAPP will reflect the strategy.

[1] Includes data from self-certification forms, return-to-compliance forms, and non-applicability forms.

B4. Analytical Methods

This project will follow well-recognized statistical analytical methods for survey samples. This section will be amended upon completion of the detailed statistical methodology. At this time, no physical tests or chemical analyses are anticipated for this project. If such analyses are to take place, this plan will be amended for EPA approval prior to commencement of the analyses.

B5. Quality Control

This project will undertake the following specific steps to measure/estimate the effect of data errors, consistent with RIDEM's Quality Management Plan. If environmental samples/lab analyses are undertaken in this project, this plan will be amended and submitted to EPA for approval prior to commencing with this work.

Crosschecking data.

Primary data collection forms will be designed in such a way to allow internal crosschecking of data by comparing answers of different questions to each other, and such crosschecking 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 sites sampled have submitted self-certification forms.

Data anomalies.

Procedures for handling data anomalies (such as outliers and missing data) will be handled based on guidance prepared in the project-specific statistical methodology.

Quality control statistics.

The quality control statistics to be used in this project are described in more detail in section D3.

B6. Instrument/Equipment Testing, Inspection and Maintenance

This section is not relevant to this project. The project will not involve such scientific instruments and equipment.

B7. Instrument/Equipment Calibration and Frequency

This section is not relevant to this project. The project will not involve such scientific instruments and equipment.

B8. Inspection/Acceptance for Supplies and Consumables

A digital camera will be used as necessary to record conditions found at construction sites. The Project Manager is responsible for inspecting and accepting supplies associated with the digital camera.

B9. Non-Direct Measurements (I.e., Secondary Data)

This project will rely upon secondary data to identify the facilities in the target population. DEM will distribute the final Check List with certification statements to all persons that submit a Notice of Intent for coverage under the General Permit. DEM will also provide check lists and certification statements to the Storm Water Coordinators for distribution to Notifiers in their respective MS4s.

Table 3: Non-Direct Measurements (I.e., Secondary Data)

Data Sources	Intended Use	Rationale for Use	Acceptance Criteria
RIPDES NOIs	Identifying the target population, for the sample	Commonly accepted source of facility list	All records will be accepted unless sample response indicates site should not be part of target population. RIDEM will cross-check any site that self-identifies as non-applicable to this project.
Regulated MS4s	Identifying the target population, for the sample	Municipalities	Will cross check with NOIs to reduce double counting

Key resources/support facilities needed.
RIDEM will require access to the data sources mentioned above, and this information will be managed within the database created/utilized for the overall project. RIDEM does not anticipate any obstacles to this approach.

Determining limits to validity and operating conditions.
Database containing the list of targeted facilities will be designed such that the original source for all facility data is marked, and procedures will be in place such that only the Project Manager can officially remove a facility entry from the target population. In such cases, facility entry will not be deleted from the database but will be marked as non-applicable, and corrective data will be provided in fields parallel to the original data.

B10. Data Management

As part of this project, RIDEM, with assistance from URI Center for Pollution Prevention & Environmental Health, 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 to reflect that strategy. The strategy will be consistent with the existing RIDEM's Quality Management Plan. 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 record keeping 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

C1. Assessment and Response Actions

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. 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.

C2. 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.

Project QA Status Reports

Type of Report	Frequency	Preparer	Recipients
Amended QAPP	Once, before primary data collection begins	RIDEM Project Manager	All recipients of original QAPP
Readiness Review	Before each major data collection task	RIDEM QA Officer	RIDEM Project Manager, RIPDES Program Manager
Progress Report	Quarterly	RIDEM	U.S. EPA Project Officer (Copying US EPA OPEI)
Progress Report	Annually	RIDEM	U.S. EPA Project Officer (Copying US EPA OPEI), stakeholders
Final Project Report	Once	RIDEM	U.S. EPA (Copying US EPA OPEI) stakeholders

D DATA REVIEW AND EVALUATION

D1. Data Review, Verification and Validation

This QAPP shall govern the operation of the project at all times. Each responsible party listed in Section A4 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 A4 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.

D2. Verification and Validation Methods

Data Validation will consist of the Project Manager (or their designee) reviewing the self certification forms, baselines inspections, and any selected follow-up to ensure that they have been filled out accurately and completely. The statistical methodology will have its own validation criteria built in.

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. These reviews and reports will be consistent with RIDEM's Quality Management Plan. Standard statistical tests (described below in Section D3) will be used to determine the extent to which inferences can be drawn from the sample data.

D3. Evaluating Data in Terms of User Needs

This section will be written and finalized after completion of the project-specific statistical methodology, which will be developed consistent with RIDEM's Quality Management Plan and EPA's *Generic Guide to Statistical Aspects of Developing an Environmental Results Program* (2003).

- **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 unusable, with particular emphasis on the impact of such unusability on data representativeness.