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# New England Regional Laboratory

North Chelmsford, MA



## Environmental Management System Manual

Revision #7

Revised: August 30, 2012

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*NOTE: This EMS manual has been organized to reflect the general elements and principles of the ISO 14001:2004 standard. As such, the numbering scheme of the sections in this manual was designed to match the corresponding number of the related clause in the standard.*

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## 4.1 GENERAL REQUIREMENTS

### 4.1.1 Purpose

The purpose of this manual is to describe the overarching policies, procedures, management systems and programs that compose the framework for the U.S. EPA New England Regional Laboratory (NERL) environmental management system (EMS). Supporting documents, such as EMS implementing procedures and Environmental Management Programs (EMPs), are briefly described and referenced by this manual.

### 4.1.2 Scope of EMS

Every organization has its own goals that stem from the vision and aspirations of its leaders. An EMS takes this as a fact, as a pre-existing condition from which the awareness and desire to be environmentally responsible emerge. That desire itself becomes an organizational goal when it is transformed into a commitment. This commitment must be specifically expressed in a written environmental policy when the organization decides to implement an EMS.

NERL's EMS presently covers the activities at the North Chelmsford, Massachusetts facility and related field work activities. Specifically, the EMS covers all operations occurring on site and within the property boundaries at the laboratory, from the point of entry of raw materials and energy to the point of exit. In addition to testing processes and activities, all on-site ancillary operations fall within the scope of the EMS, including maintenance, grounds keeping, office activities, and the activities of on-site contractors. The EMS also includes the disposal of its waste for evaluating the environmental impacts of on-site activities, even though NERL may not ultimately be the final disposer of its waste. The EMS also considers field work related activities as part of the scope.

### 4.1.3 Background of EMS

Formal Environmental Management Systems (EMS) emerged in the early 1990s to provide organizations with a proactive, systematic approach for managing the potential environmental consequences of their operations. Such systems have been widely adopted by industry and government and have been effective at improving regulatory compliance and environmental performance.

In April 2000, President Clinton signed Executive Order (E.O.) 13148, "Greening the Government through Leadership in Environmental Management" that established a 5-year EMS implementation goal for all Federal Facilities. President Bush and the current administration have supported this position, as evidenced by EO 13423 "Strengthening Federal Environmental, Energy, and Transportation Management" which superceded EO 13148 and strengthened the administration's commitment to using EMS as a means to manage risks and impacts to the environment across all Federal agencies. In October 2009 President Obama signed EO 13514 "Federal Leadership in Environmental, Energy, and Economic Performance," which further expanded on the energy reduction and environmental performance requirements for Federal agencies. The U.S. Environmental Protection Agency (EPA), as the principle steward for the environment, has taken a leadership position by developing an EMS implementation initiative.

### 4.1.4 EMS Framework

Although several recognized EMS frameworks exist, most are based on the current International Organization for Standardization's ISO 14001:2004 EMS standard. As a result, ISO 14001 is the framework on which organizations most frequently choose to base their EMS. NERL has adopted the general principles and elements of the ISO 14001 framework in the development of its EMS.

ISO management systems traditionally utilize the Plan-Do-Check-Act (PDCA) process to incorporate continual improvement processes. The PDCA cycle is an ongoing process, with the complete cycle repeated on a periodic basis. NERL has incorporated the PDCA process in the development, implementation and maintenance of its EMS. The components of this process are described below:

#### **Phase 1: Planning**

The organization identifies how its operations might harm the environment, and develops methods to reduce this harm.

#### **Phase 2: Doing**

The organization implements these methods to reduce harm and operates them for a designated time period.

#### **Phase 3: Checking**

The organization assesses whether the methods that it is operating to reduce environmental harm and ensure regulatory compliance are proving to be effective.

#### **Phase 4: Acting**

The organization determines what changes are necessary based on the performance assessment of the methods (see Phase 3) designed to reduce environmental harm.

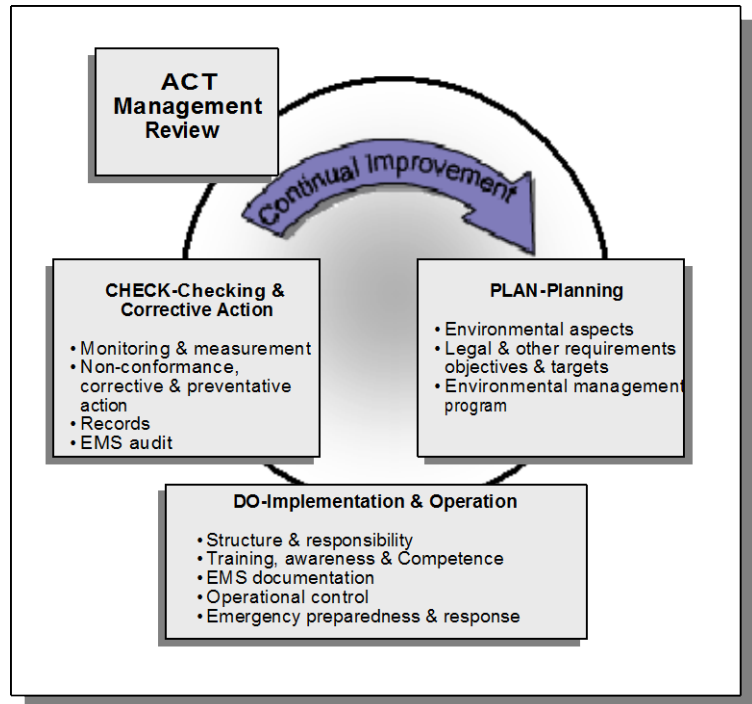
The findings of Phase 4 may indicate that adjustments to methods already in place are necessary or that entirely new methods are needed to achieve established environmental objectives. Output from this phase is fed back into Phase 1 Planning to make necessary changes and additions designed to bring the EMS to the desired level of effectiveness. This system feedback propels the continual improvement of the EMS.

The EMS continually moves through this cycle, fine-tuning its management of those areas of the organization's operations that may harm the environment and/or present a risk to the organization. This "continual improvement cycle" is a core tenet of the EMS; it allows the system to adapt to the dynamic nature of the organization's operations and needs.

#### **4.1.5 Organizational Profile**

##### **General**

Organization name: EPA New England Regional Laboratory  
 Address: 11 Technology Drive  
 North Chelmsford, MA 01863  
 Phone number: (617)918-8300  
 Fax number: (617)918-8397  
 E-mail: last.name.first.name@epa.gov  
 Home page: www.epa.gov/region1/lab



**Figure 1: ISO 14001 EMS Model**

**Incorporation, Ownership, Decision Makers And Users**

Type: Not-For-Profit – Federal Government

Countries in which EPA New England Regional Laboratory operates: United States

**Organizational Directors**

Name	Position
Robert Maxfield	Director OEME
Arthur Johnson	Deputy Director OEME

**Executive Decision Makers:**

Name	Position
Robert Maxfield	Director
Arthur Johnson	Deputy Director
Ernest Waterman	Manager, Investigations & Analysis
Gerry Sotolongo	Manager, Quality Assurance
Katrina Kipp	Manager, Ecosystems Assessment

**Other Stakeholders**

Name
EPA Headquarters
EPA Regional Offices Serviced
EPA OEME Employees
State Environmental Agencies
Residents / Citizens of New England

**Nature Of Business**

Type: Federal Government Agency

Primary activities:

The NERL provides services for analytical testing of water, soil and air samples, compliance sampling, field investigations, environmental monitoring and quality assurance support for EPA Region I.

Secondary activities:

The NERL also functions as conference space for regional meetings, the alternative continuity of operation location for the Boston office in case of an emergency and provides parking for some regional vehicles that can not be parked in Boston.

**Operations**

Production: Primary operational activities include analytical services for water, soil and air samples and written reports.

Purchasing: The facility purchases office, field, and lab equipment to perform day-to-day functions. General office supplies, energy and fuel are purchased to perform office duties. NERL also purchases recycled / post consumer goods.

## Industry

Nature of the industry: Federal Government Agency

Position within industry: NERL is one of ten Regional laboratories nationally and services the Boston Regional office.

Governments/regulatory bodies affecting organization's operations:

Federal Government:  
Specify: RCRA, Worker Safety, Radiation  
Contact: USEPA, OSHA, NRC

Provincial or State Government:  
Specify: RCRA, Air Pollution Control  
Contact: MADEP

Municipal Government:  
Specify: Lowell Wastewater Utility  
Contact: City of Lowell

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## Corporate Information

**Facility Description** - NERL is approximately 68,000 square feet situated on approximately 12 acres. The facility is broken into three main areas: laboratories, mechanical room, and facilities. The building received a gold rating in version 1.0 in the LEED program for green building. The three areas provide working space for each of the Units at the laboratory. The laboratory consists of 29 rooms with four primary corridors broken out into biology, inorganics, organics, and air. The facility utilizes native landscaping design to minimize maintenance and additional watering by utilizing native plants and vegetation.

**Organizational structure** - NERL is one of six Divisions of the Boston Regional Office and monitors and analyzes the health of the New England environment and its impacts on residents. NERL consists of the front office, which includes the Safety Health Environmental Management (SHEM) Office, and three other organizational units:

- Front Office / SHEM Office/Facilities – Consists of a Director and Deputy Director to provide overall direction and leadership. The SHEM Office oversees personnel health and safety, ensures regulatory compliance and manages the EMS. Facilities provide supplies and logistical support to personnel working on-site. While falling under the guidance of the front office, Facilities is located off of the Ecosystem Assessment Unit's corridor.
- Investigation and Analysis Unit - Analyzes and tests air, water, sediment and toxic waste samples for various chemicals and conducts field studies and inspections of industrial and municipal facilities to ensure compliance with EPA regulations;
- Ecosystem Assessment Unit - Analyzes samples for bacteria, toxicity, fish tissue contamination, performs ambient field studies to measure air and water quality and biological conditions and oversees the ambient air monitoring network; and
- Quality Assurance Unit - Ensures that environmental data is precise, accurate and valid so it can be used to support decision-making.

**Management system structure** - NERL's EMS is modeled after the ISO 14001 standard, and was originally developed following the sections of the standard within the GreenWare software program. This EMS manual has been organized with specific sections to reflect this standard.



**Management systems books and records** - NERL's EMS manual and procedures were originally created and documented in the GreenWare software package. In 2008, the manual, procedures and other related documents were migrated out of the GreenWare system to a MS Word format. This manual references other related EMS documents, such as implementing procedures and environmental management programs that are elements of the management system.

**Computers and software packages** - NERL uses networked servers and personal computers which include intranet and internet connections. Software packages include a wide variety of commercially-available software, including but not limited to GreenWare, Lotus Notes, MS Word, MS Excel, MS PowerPoint and MS Office.

**Expected growth potential and outlook** - Flat to downsized.

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**Personnel**

Number of employees:

Office:	60
Laboratory:	17

Totals include EPA personnel, grantees and contractors.

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**Management System**

Date of EMS implementation: 11/2/2004

**Management system personnel:**

Name	Title	Reports to
Robert Maxfield	Director	Curt Spalding
Arthur Johnson	Deputy Director	Robert Maxfield
Ernest Waterman	Manager, Investigations & Analysis	Robert Maxfield
Gerry Sotolongo	Manager, Quality Assurance	Robert Maxfield
Katrina Kipp	Manager, Ecosystems Assessment	Robert Maxfield
Troy Sullivan	EMS Coordinator	Robert Maxfield
Scott Pellerin	Backup EMS Coordinator	Robert Maxfield

**Environmental issues initially identified relate to:**

- Emissions to air
- Releases to water
- Waste generation
- Use of raw material/natural resources
- Transport of toxic/dangerous materials
- Local environmental and community issues

**Facility**

Facility type (name location)	Owned/leased	Age	Condition
<b>Office</b>			
New England Regional Laboratory	Leased	12 years	New, since 9/01

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## 4.2 ENVIRONMENTAL POLICY

The environmental policy documents the intentions and principles of the New England Regional Laboratory's management in relation to environmental performance and provides the framework for setting environmental performance objectives. The environmental policy is described in the document titled "*Environmental Policy*."

A procedure was developed and documented that describes the process used to develop and maintain the environmental policy. This procedure is titled "*4.2 Environmental Policy*" and is reviewed on an annual basis to ensure the procedure remains effective and up to date.

In accordance with the procedure, the environmental policy is reviewed on an annual basis to ensure it remains relevant to the organization and considers any changes in focus and/or needs of NERL.

The environmental policy is communicated to all employees, contractors, and others working on behalf of NERL. The policy is presented to staff during EMS awareness training. The EMS Coordinator is responsible for maintaining records pertaining to the implementation and review of the policy.

The environmental policy is made available to the public in accordance with the Agency's and NERL's established external communication and information control procedure by having it posted on NERL's website.

## 4.3 EMS PLANNING

### 4.3.1 Environmental Aspects

For the initial development of its EMS, NERL utilized the GreenWare software system to identify all of the activities, products and services within the scope of the EMS over which it has control or influence, and their associated aspects. These aspects were evaluated, scored and ranked using the GreenWare software to determine those aspects considered by the organization to have a significant environmental impact or pose a significant risk to the environment or the organization.

A procedure was developed and documented that describes the process used to determine these aspects and what criteria were used to determine significance. This procedure is titled "4.3.1 Environmental Aspects" and is reviewed on an annual basis to ensure the procedure remains effective and up to date.

In accordance with the procedure, the activities and aspects are reviewed on an annual basis to ensure they remain relevant to the organization and consider any changes in the activities and/or needs of NERL within the defined scope of the EMS.

A current list of significant environmental aspects (SEAs) is maintained by the EMS Coordinator and is located on-line in the Lotus Notes Database as part of the management system documentation.

### 4.3.2 Legal and Other Requirements

When determining significant environmental aspects, NERL considers legal and other requirements. Legal and other requirements are those established by federal, state government, and other authorities that apply to environmental aspects of NERL. Other requirements include those stipulated by Agency policy or directives, or by Executive Order.

NERL has developed a procedure to ensure it maintains knowledge of current legal and other requirements that are applicable to the environmental aspects (hazards) of its activities, products, and services. The procedure is titled "4.3.2 Legal & Other Requirements" and is maintained by the EMS Coordinator on-line in the Lotus Notes Database within the documentation of the EMS.

Legal and other requirements are incorporated into the environmental management system (EMS) and will be considered as one of the criteria used to identify environmentally significant aspects and to establish objectives and targets for those aspects at all relevant levels and functions of the organization.

Environmental management programs (EMPs) are developed to manage each SEA and achieve the organization's objectives and targets for that aspect and includes a listing of the current legal and other requirements associated with that aspect. The EMS Coordinator is responsible for ensuring that the legal and other requirements listed within the EMP are current. The EMPs are maintained by designated staff and are available on-line in the Lotus Notes Database as part of the management system documentation.

### 4.3.3 Objectives & Targets

Objectives and targets have been established for each identified SEA. An objective is an overarching goal established by the organization to be consistent with its environmental policy for the management of its SEAs and continual improvement of the EMS and NERL's environmental performance. Objectives can range from significant improvement of environmental performance to maintaining an existing program. Typically, where the established objective is to maintain the current program, the program has been in place for some time and is very robust and functioning well (e.g., programs that address existing regulatory requirements – air, waste water, hazardous waste and others).

Targets are established for each objective and consist of specific performance requirements and a schedule for implementation in order to achieve the established objective. Progress toward targets is determined by

developing performance indicators or metrics that can be either quantitative or qualitative.

NERL has developed a procedure to establish objectives and targets. The procedure is titled “4.3.3 Objectives & Targets” and is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

#### **4.3.4 Environmental Management Programs**

An environmental program (EMP) describes how the organization manages its environmental aspects that are deemed significant (see Section 4.3.1 of this manual). An EMP is in place for each SEA and includes or references a specific action plan (i.e., the means, tasks and time frame) for achieving environmental objectives and targets (see Section 4.3.3 of this manual). The EMP also includes roles and responsibilities, performance indicators, and operational controls associated with the aspect, activity and action plan.

NERL has developed a procedure to develop and maintain EMPs. The procedure is titled “4.3.4 Environmental Management Programs” and is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

## 4.4 EMS IMPLEMENTATION AND OPERATION

### 4.4.1 Structure & Responsibility

Consistent with the environmental policy, the management of NERL has committed to managing identified SEAs within the EMS incorporating continual improvement principles. This management commitment includes making available the resources needed to establish, implement, maintain and improve the EMS.

A procedure has been developed to describe NERL's organizational structure relating to the EMS and how the EMS functions within NERL's overall organizational structure in terms of authorities, roles, and responsibilities for environmental management.

The procedure is titled "*4.4.1 Structure & Responsibility*" and is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

### 4.4.2 EMS Training

NERL periodically identifies training needs to ensure that all persons working for or on behalf of NERL who perform tasks that have the potential to cause or contribute to a significant environmental impact are competent based on education, training or experience.

A procedure has been developed to establish guidelines for periodic EMS awareness and competency training. More specifically, this procedure establishes an employee training program that achieves EMS awareness, as well as a process for identifying training. The procedure is titled "*4.4.2 EMS Training*," and is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

### 4.4.3 Communication

NERL has developed a procedure that establishes a process for internal communication to build understanding, cooperation, and involvement from all employees of NERL and assure performance of their duties in an environmentally conscious manner. The procedure is titled "*4.4.3-I Internal Communication*."

NERL also has developed a procedure that establishes a process for external communications regarding its EMS. The procedure is titled "*4.4.3-II External Communication*."

These procedures are maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

### 4.4.4 EMS Documentation

The NERL EMS was developed to reflect the document structure included in ISO 14001. It includes all of the elements described in Sub clause 4.4.4 of the standard, as follows:

- a) The environmental policy, objectives and targets,
- b) Description of the scope of the environmental management system,
- c) Description of the main elements of the environmental management system and their interaction, and reference to related documents,
- d) Documents, including records, required by this International Standard, and
- e) Documents, including records, determined by the organization to be necessary to ensure the effective planning, operation and control of processes that relate to its significant environmental aspects.

### 4.4.5 Document Control

NERL follows an established procedure that describes processes for creating, approving, reviewing and maintaining EMS documents. This procedure addresses document and version control, approval and review

processes, and a document retention schedule for environmental management documents. The procedure is titled "4.4.5 Document Control."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

#### **4.4.6 Operational Control**

NERL has developed guidance for determining the operational controls that are to be applied to its activities, products or services that exhibit significant environmental aspects. The procedure is titled "4.4.6 Operational Control."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

#### **4.4.7 Emergency Preparedness and Response**

NERL has developed a procedure to ensure that it establishes and maintains emergency plans and procedures designed to minimize or otherwise mitigate the environmental impacts associated with unexpected or accidental incidents. The procedure is titled "4.4.7 Emergency Preparedness & Response."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

## 4.5 TRACKING PERFORMANCE AND CORRECTIVE ACTION

The NERL EMS is periodically assessed to verify that operations continue to comply with requirements of the EMS, including the EMS Manual, procedures, EMPs, related work instructions, any applicable legal requirements and progress made toward objectives and targets. NERL's internal EMS assessments include monitoring and measurement, audits, and/or management review performed by NERL personnel or other qualified parties.

### 4.5.1 Monitoring and Measurement

Monitoring and measuring of key characteristics of operations and activities associated with significant environmental aspects may be conducted to track:

- Overall environmental performance
- Progress toward achieving objectives and targets
- Effectiveness of operational controls or
- Continual improvement

NERL has developed a procedure that describes the process for monitoring and measuring its operations and activities that can have significant environmental impacts. The intent of such monitoring and measuring is to track environmental performance, assess implementation and effectiveness of operational controls, and evaluate achievement of environmental objectives and targets, and compliance with regulatory requirements. The procedure is titled "4.5.1 Monitoring & Measurement."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

### 4.5.2 Evaluation of Compliance

NERL has an established audit procedure that periodically evaluates compliance with regulatory and other requirements. While performing internal audits of the EMS, the status of compliance with legal and other requirements is ascertained and documented. This may be achieved by reviewing the results of the most recent compliance audit and determining whether the corrective/preventive action process was effectively implemented. The procedure is titled "4.5.2 Evaluation of Compliance."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

### 4.5.3 Non-conformance and Corrective/Preventive Action

NERL has developed a procedure that describes the process to ensure that NERL establishes, maintains and uses a system to identify system non-conformances, or noncompliance with regulations and other requirements and to specify a corrective/preventive action process to follow to investigate the root cause, determine, implement and track corrective/preventive actions and evaluate their effectiveness. The procedure is titled "4.5.3 Non-conformance and Corrective/Preventive Action."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

### 4.5.4 Records Management

NERL has developed a procedure that defines the steps that NERL follows to ensure that the environmental management system (EMS) records and other environmental records are properly identified, collected and filed to allow for ready access and retrieval. The procedure is titled "4.5.4 Records Management."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the



management system documentation.

#### 4.5.5 Internal Audit

NERL has developed a procedure that defines the protocol for performing internal EMS audits. The procedure defines the processes for scheduling, conducting, and reporting periodic audits of the NERL EMS. EMS audits will be conducted by qualified auditors to determine whether the EMS is consistent with the requirements of ISO 14001 and if the EMS has been properly implemented and maintained. EMS audits identify deficiencies and potential vulnerabilities of the EMS. The procedure is titled "4.5.5 EMS Audit."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.

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#### **4.6 MANAGEMENT REVIEW**

NERL has developed a procedure that defines the process and primary agenda of issues to be included in the Management Review of the NERL EMS. The Management Review is intended to provide a forum for discussion and improvement of the EMS and to provide management with the opportunity to give feedback on the EMS and its environmental improvement goals. During the Management Review, the EMS is reviewed to determine its continuing suitability, adequacy and effectiveness relative to the needs of the organization. The procedure is titled "4.6 Management Review."

This procedure is maintained by the EMS Coordinator on-line in the Lotus Notes Database as part of the management system documentation.