This guidance document does not have the force and effect of law and is not meant to bind the public in any way. The document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies. Recipients or sub-recipients should refer to FTA’s statutes and regulations for applicable requirements.
# TABLE OF CONTENTS

1. **Introduction** ........................................................................................................................................................................ 3

   1.1 ESMS Online Program ......................................................................................................................................................... 3
   1.2 ESMS Institute ......................................................................................................................................................................... 3

2. **Resources** ............................................................................................................................................................................. 3

   2.1 Whitepapers/PowerPoints/Webinars ........................................................................................................................................ 3
      2.1.1 “What” and “Why” of an ESMS ........................................................................................................................................ 3
      2.1.2 Nine Steps to Developing a Foundation for a Successful ESMS ........................................................................................ 3
      2.1.3 Sustaining Your ESMS ...................................................................................................................................................... 4
      2.1.4 Root Cause/5 Whys ......................................................................................................................................................... 4

3. **Best Management Practices** ......................................................................................................................................................... 4

   3.1 Development (Planning) ............................................................................................................................................................ 4
      3.1.1 Benefits of Adopting an ESMS — MTA, TriMet .................................................................................................................. 5
      3.1.2 Framework of Organization — LA Metro .......................................................................................................................... 6
      3.1.3 Issues Inside and Outside your Organization — LA Metro ................................................................................................ 7
      3.1.4 Senior Management — Leadership and Commitment Pledge — SORTA ........................................................................... 7
      3.1.5 Senior Management — Mission/Vision Policy Statement — LA Metro ............................................................................ 9
      3.1.6 Senior Management Commitment — MTA, LA Metro ....................................................................................................... 10
      3.1.7 Contributions, Obligations and Authorities — LA Metro, MTA ......................................................................................... 11
      3.1.8 Developing Environmental Characteristics and Influences — MTA ................................................................................ 20
      3.1.9 Legal Requirements — LA Metro ........................................................................................................................................ 21
      3.1.10 Integrating ESMS into Agency Strategic Planning and Goals and Funding — LA Metro .................................................. 22
      3.1.11 Developing Goals and Targets — MTA, TriMet, BART, MARTA ...................................................................................... 23

   3.2 Implementation (Doing) ............................................................................................................................................................... 26
      3.2.1 Providing Competent, Knowledgeable Staff with the Tools to Develop, Implement and Maintain an ESMS — SEPTA, SORTA ............................................................................................................................... 26
      3.2.2 Effective System for Communicating — MTA, SORTA ....................................................................................................... 32
      3.2.3 Planning and Managing Emergencies — PAAC ................................................................................................................ 34

   3.3 Maintenance (Checking/Acting) ..................................................................................................................................................... 35
      3.3.1 Examination, Investigation, Evaluation — CapMetro, MTA ............................................................................................... 35
      3.3.2 Examination, Investigation, Evaluation/Calibration — BART, MTA .................................................................................. 37
      3.3.3 Appraisal of the ESMS — SORTA ....................................................................................................................................... 40
      3.3.4 ESMS Review by Management — MTA ................................................................................................................................ 41
      3.3.5 Nonconforming Practices and Remedial Action — MTA ................................................................................................... 43
      3.3.6 Enhancement of the ESMS — SEPTA .................................................................................................................................... 45

4. **Closing — Living Document** ......................................................................................................................................................... 45
The purpose of this Guidebook is to provide you with a single source reference to learn about the important elements for developing, implementing and maintaining an Environmental and Sustainability Management System (ESMS).

This Guidebook acts as a library access point for you to retrieve, study and implement “Best Practices” associated with developing, implementing and maintaining a successful ESMS. These examples represent a small sample, and in many cases, only provide a small portion of the full documentation needed so that you can see what is expected to meet the ESMS requirements. To fully understand how the “best practices” work in an ESMS, FTA and Virginia Tech recommend you access ESMS development program information available online.

1. Introduction

1.1 ESMS Online Program
For more comprehensive information on the components of an ESMS, it is recommended you take the FTA online Introductory ESMS course available through the National Transit Institute.

1.2 ESMS Institute
The ESMS institute, when offered, provides guidance and tools to successfully develop, implement, maintain and sustain an ESMS for your organization. Virginia Tech Institute Website: http://www.cpe.vt.edu/esms/

2. Resources

2.1 The following whitepapers have been developed and are available on the FTA website

2.1.1 “What” and Why” of an ESMS
You may be considering activities needed to develop an ESMS but you are not sure where to start. The whitepaper summarizes information on the foundation associated with the development of an effective environmental and sustainability system. This information will serve as a helpful guide in your decision to move forward.

2.1.2 Nine Steps to Developing a Foundation for a Successful ESMS
Building an ESMS might seem like a daunting endeavor, but it need not be. Taken in steps, it is a journey that can be successful for any organization. The whitepaper summarizes the steps that are important for building a strong foundation needed for the successful development of an effective ESMS.
2.1.3 Sustaining your ESMS
Once an ESMS is developed and implemented, organizations need to sustain and maintain their ESMS. Tools and information to keep the ESMS functioning in operations as the organization moves forward though time are essential. This information is not only useful to organizations that have an existing ESMS program, but may also be beneficial for those in the early stages of establishing an ESMS. The whitepaper is useful for organizations that have existing or nascent ESMS programs.

2.1.4 Root Cause/5 Whys
Five whys (or 5 Whys) is an iterative, interrogative technique used to explore the cause-and-effect relationships underlying a particular problem. The primary goal of the technique is to determine the root cause of a defect or problem by repeating the question “Why?” Each answer forms the basis of the next question. The “five” in the name derives from an anecdotal observation on the number of iterations needed to resolve the problem. The whitepaper provides information to assist in identifying root causes associated with nonconforming practices identified within your ESMS.

3. Best Management Practices
The remainder of this Guidebook provides examples and excerpts of transit-oriented ESMS best practices provided by existing transit organizations. The best practices are divided into three sections:

- **DEVELOPMENT** which corresponds to the planning phase of getting organized and ready to start.
- **IMPLEMENTATION** which corresponds to the doing phase by performing the tasks necessary to build your ESMS.
- **MAINTENANCE** which corresponds to the checking and acting phase where the actions implemented are reviewed for effectiveness and actions are taken to improve ESMS performance.

Please note that in some cases document examples may contain items related to ISO 14001:2015 which are copyrighted in association with FTA/VT ESMS Institutes and may not be reproduced without the consent of the International Organization for Standardization www.iso.org OR without the consent of the respective organizations identified in this Guidebook.

3.1 Development (Planning)
As with most sound management activities, it is best to have a plan for developing, implementing and revising your ESMS so that you can maximize your efficiency in carrying out the functions while improving morale, strengthening organizational performance, meeting the needs of customers, saving money and improving the environment.

In many cases it is best to identify the benefits of a program so that you can increase understanding of the purpose of the program and obtain buy-in from members of your organization. Two examples are provided below which represent documented benefits from the Maryland Transit Administration (MTA) and the Tri-County Metropolitan Transportation District of Oregon (TriMet).
3.1.1 Benefits of Adopting an ESMS

MTA

There are many potential benefits associated with adopting an ESMS at the Cromwell facility. Benefits that are or may be significant to MTA include:

- Integrated Environmental Policy into the MTA Mission
- Reduced environmental compliance incidents
- Improved state and federal regulator relationships
- Reduced waste and pollution
- Increased fuel economy
- Enhanced public image
- Improved internal and external communications
- Improved employee awareness of potential environmental impacts of work activities
- Sustainable transportation service and business practices that reduce costs and resource usage
- Increased staff productivity and safety
- Transit and Regional Leadership
- Compliance monitoring through use of the MTA Geographic Information System (GIS)

Source: MTA, FTA FINAL REPORT, Page 29, 2017
Contact: Robert Frazier, Environmental Manager
1515 Washington Boulevard, Baltimore, MD 21230
Phone: 410-454-7317
Email: rfrazier@mta.maryland.gov

TriMet

- Cost savings from reduced energy/gas use
- Resource conservation
- Improved environmental compliance
- Increased awareness of chemical use
- Created a framework to be implemented at other facilities
- Increased operating efficiency
- Employee collaboration across agency divisions
- Reduced operating costs
- Enhanced document controls and document management
- Reinforced image with the public
- Employee awareness of environmental issues and responsibilities
- Ensures that all local, state and federal regulations are met

Source: FTA Final Report, TriMet section, Page 58, 2017
Contact: Kimberley Angove angovek@trimet.org
4012 SE 17th Ave, Portland, OR 97202
Phone: 503-962-4831
Email: angovek@trimet.org
3.1.2 Framework of Organization – LA Metro

One of the first items to understand is the framework in which your organization is operating. This includes understanding what issues affect your organization in a good or bad way. These issues can include environmental factors, physical location factors that affect how you do business, the culture of the community which you serve, and specific needs of those interested in your organization based on location, age or physical condition.

Below is an excerpt from LA Metro based on initial Virginia Tech Institute work in 2016 that identifies the fence line, issues and those interested in their ESMS.

5.3.1 Metro maintains a multi-site Environmental Management System (EMS) which follows the ISO 14001:2015 standard. Multi-site facilities can include physical sites or the overall implementation of EMS for construction projects.

5.3.2 The Scope of Metro’s EMS includes the environmental activities and supporting processes associated with the environmental and sustainability commitments as mentioned in the scope. More detail follows. Refer to 4.0-1 ED Attachment A and 5.0-2 EP Roles and Responsibilities for further description of the boundaries and applicability of the environmental management system.

- **Bus Maintenance Facilities.** Facilities are between 3 to 28 acres of land and typically include a maintenance building, fuel and vacuum building, bus wash, paint booth and a transportation operations building. The activities and equipment located on site are used to maintain and repair buses.

- **Rail Maintenance Facilities.** Facilities are between 9 to 40 acres of land and typically include a multi-story maintenance building, blow-down building, train wash building and storage building. The activities and equipment located onsite are used to maintain and repair rail cars.

- **Capital Project Construction.** The processes related to the overall agency-wide Capital Project Construction elements (vs, per individual project) are monitored for conformance to the ISO 14001:2015 standard. However, implementation of the EMS still considers the environmental and compliance obligations of each construction facility. Construction facilities can range in size from structural updates, upgrades, or renovations to highway, busway, or rail construction on new rights-of-way.

- The EMS Scope can be expanded as determined by the EMS Administrator to include other LA Metro business units. Under such conditions, appropriate changes to the LA Metro EMS will be conducted with the changes approved by the EMS Administrative Team.

Source: FTA/VT ESMS Institute Homework, LA Metro, 2016
Contact: Dr. Cris B. Liban, P.E., ENV SP Executive Officer, Environmental Compliance and Sustainability
One Gateway Plaza, Los Angeles, CA
Phone: 213/922-2471
Email: LibanE@metro.net
3.1.3 Issues Inside and Outside Your Organization — LA Metro
LA Metro outlined, in a very practical approach, the challenges it faced by describing the issues as “What’s happening?” and “What needs to happen.” This approach might help you and your colleagues get started. You should “go big” when you identify issues inside and outside your organization and then begin to focus on how those issues directly affect your organization.

<table>
<thead>
<tr>
<th>What’s happening?</th>
<th>What needs to happen…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evolving regulatory requirements and extreme weather events</td>
<td>Proactive planning, construction, and operational activities to reduce impacts</td>
</tr>
<tr>
<td>Increasing costs of operation and decreasing resource availability</td>
<td>Create efficiencies, develop forecasting tools and implement creative and integrated technologies</td>
</tr>
<tr>
<td>Needing to build the correct project</td>
<td>Understand the transit and technology interface considering environment, equity, and economy</td>
</tr>
</tbody>
</table>

Source: LA Metro — PPT Presentation, May 27, 2016
Contact: Dr. Cris B. Liban, P.E., ENV SP Executive Officer, Environmental Compliance and Sustainability
One Gateway Plaza, Los Angeles, CA
Phone: 213/922-2471
Email: LibanE@metro.net

3.1.4 Senior Management-Leadership and Commitment Pledge — Metro-Southeastern Ohio Transit Authority (SORTA)

Environmental/Sustainability Policy
Environmental policies, mission statements and visons are established to demonstrate commitment from top management to support its environmental performance.

An example from SORTA follows.
Environmental & Sustainability Management System

Leadership and Commitment Pledge

Top management shall demonstrate leadership and commitment with respect to the environmental management system by:

- Taking accountability for the effectiveness of the environmental management system
- Ensuring that the environmental policy and environmental objectives are established and are compatible with the strategic direction and the context of the organization
- Ensuring the integration of the environmental management system requirements into the organization’s business processes
- Ensuring that the appropriate resources needed for the environmental management system are available
- Communicating the importance of effective environmental management and of conforming to the environmental management system requirements
- Ensuring that the environmental management system achieves its intended outcomes
- Directing and supporting employees to contribute to the effectiveness of the environmental management system
- Promoting continual improvement
- Supporting other relevant management roles to demonstrate leadership as it applies to their areas of responsibility

Dwight Ferrell, Chief Executive Officer & General Manager
Darryl Hales, Executive Vice President/Deputy General Manager
David Riposo, Senior Vice President/Finance/Chief Financial Officer
Sallie Hanners, Vice President External Affairs

Donna Adkins, Chief of Staff
Carla McHale, Interim Vice President of Human Resources

Source: FTA Final Report, SORTA section, Page 49, 2017
Contact: T J Thorn, OHST, TSSP Vice President, Safety and Security/Chief Safety Officer
1401 Bank Street, Cincinnati, OH 45214-1737
Phone: 513-632-7651
Email: tjthorn@go-metro.com
3.1.5 Senior Management — Mission/Vision — LA Metro Policy Statement

Los Angeles County Metropolitan Transportation Authority Environmental Management System Policy

POLICY STATEMENT

Los Angeles County Metropolitan Transportation Authority (Metro) will be a leader in maximizing the environmental effort and its benefits for Los Angeles County through our core mission of moving people efficiently and effectively using an Environmental Management System (EMS) as its primary tool in applying sustainable principles and practices in our planning, construction, operations, and procurement to protect the environment for present and future generations.

PURPOSE

The purpose of this policy is to provide guidance for continual improvement in reducing environmental impacts through the following, 1) identifying potential environmental impacts generated by our development activities and developing mitigation measures to address those impacts; 2) operating and maintaining Metro vehicles and facilities to minimize negative impacts on the environment; 3) reducing our consumption of natural resources; 4) reducing or eliminating the use of hazardous materials; 5) increasing the amount of recycling and use of recycled products; and 6) reducing and/or diverting the amount of solid waste going to landfills.

COMMITMENT

Metro provides multi-modal public transit services that greatly improve the quality of the environment in the communities it serves. We are committed to planning and constructing our projects, operating and maintaining our facilities and vehicles, and procuring products and services consistent with State and federal laws and regulations and in a manner that protects human health and the environment but not neglecting the efficient delivery of quality public transit services within our financial ability.

To demonstrate our commitment, we will:

- Comply with all environmental, federal, State, and local laws and regulations, and other requirements;
- Restore the environment by providing mitigation and corrective action and by monitoring to ensure that environmental commitments are implemented;
- Improve our ability to manage and account for environmental liabilities and risk;
- Avoid environmental degradation by minimizing releases to air, water, and land;
- Prevent pollution and conserve resources by reducing waste, reusing materials, recycling, and preferentially procuring for environmentally-friendly products and materials;
- Encourage and support the development of standards that encourage public transit use and environmental protection;
- Conduct training to raise awareness among employees and the general public regarding environmental protection and sustainable practices;
- Ensure that the planning, design, construction, and operation of our facilities and services consider environmental protection and sustainable features;
- Periodically review and implement updated environmental protection procedures and practices to ensure that they provide effective solutions for the problems they are designed to prevent or correct;
- Recognize and encourage citizen awareness and involvement in our efforts to protect the environment and educate the public about the environmental benefits of our transit system;
- Build relationships with our contractors, vendors, consultants, and transit partners during planning, design, construction, operation and procurement to protect and enhance the environment;
- Consider alternative solutions such as promoting and tapping renewable energy sources to address energy and environmental challenges;
- Maintain an EMS with environmental objectives and targets that are measurable, meaningful, understandable, and support continual improvement; and
- Communicate the goals and progress of this Policy and the EMS to Board Members, officers, employees and the public.

Source: LA Metro CEMS 5.0-1 ED Attachment A Version: 3/26/13
Contact: Dr. Cris B. Liban, P.E., ENV SP Executive Officer, Environmental Compliance and Sustainability
One Gateway Plaza, Los Angeles, CA
Phone: 213/922-2471
Email: LibanE@metro.net
3.1.6 Senior Management Commitment

MTA

The Maryland Department of Transportation Maryland Transit Administration (MDOT MTA) is a customer-driven organization that delivers safe, efficient and reliable transit solutions with world-class customer service. MDOT MTA’s policy is to conduct our mission in a manner that is protective of human health, safety and the environment, while efficiently managing the public resources that support our operations.

Through its Environmental Policy and Environmental and Sustainability Management System (ESMS), MDOT MTA commits to:

- Promote and support innovative solutions, including public-private efforts that protect the environment and maintain sustainable process improvement.
- Introduce environmental protection, pollution prevention and sustainable processes in the early planning stages of new programs, transit facilities and in all work conducted on MDOT MTA properties.
- Comply with applicable federal, state, and local environmental regulations and policies with regularly scheduled internal assessments.
- Evaluate the effectiveness of MDOT MTA’s environmental management program through application and review of the ESMS to ensure that established objectives and targets are met.
- Promote a spirit of collaboration, cooperation and responsiveness both internally and with federal, state and local regulators.
- Implement and maintain MDOT MTA’s environmental policy through effective communication with our employees and stakeholders.
- Implement proactive, sound and fiscally responsible environmental stewardship and sustainable practices.

“We at MDOT MTA have a responsibility to preserve our environment for future generations. The Environmental and Sustainability Management System will be a powerful tool in moving our agency forward in a holistic manner and is aligned with the Hogan Administration’s directive of making Maryland the national leader in environmental protection and sustainability practices.”

– Mr. Kevin B. Quinn, Administrator, MDOT Maryland Transit Administration

Source: FTA Final Report, MTA section, Page 29, 2017
Contact: Robert Frazier, Environmental Manager
1515 Washington Boulevard, Baltimore, MD 21230
Phone: 410-454-7317.
Email: rfrrazier@mta.maryland.gov
LA Metro

On April 16, 2009, the Metro Board approved the Environmental Policy which formalizes Metro’s “commitment to protecting the environment using sustainable principles and practices in our Planning, Construction, Operations, and Procurement Departments”. This policy illustrates our leadership in maximizing our environmental efforts and its benefits for Los Angeles County through transportation.

LA Metro has an Executive Officer, Environmental Compliance and Sustainability, who ensures the uniform implementation of the Environmental Management System and its principles across the agency.

Source: LA Metro CEMS 5.0-1 ED Attachment A Version: 3/26/13
Contact: Dr. Cris B. Liban, P.E., ENV SP Executive Officer, Environmental Compliance and Sustainability
One Gateway Plaza, Los Angeles, CA
Phone: 213/922-2471
email: LibanE@metro.net

3.1.7 Contributions, Obligations and Authorities

Personnel involved in the organization’s environmental management system need to understand their contributions, obligations and authorities as they pertain to the system.

Below are examples of contributions, obligations and authorities. LA Metro and MTA refer to them as roles, responsibilities and authorities (ISO 14001:2015 terminology).

LA Metro Roles and Responsibilities CEMS 5.0-2 ED Roles and Responsibilities Matrix

<table>
<thead>
<tr>
<th>Role</th>
<th>Description of EMS Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXECUTIVE MANAGEMENT</strong></td>
<td></td>
</tr>
<tr>
<td>Chief Executive Officer</td>
<td>Endorses the Metro EMS Policy to the Metro Board.</td>
</tr>
<tr>
<td></td>
<td>Assures commitment to continual improvement in environmental performance.</td>
</tr>
<tr>
<td></td>
<td>Supports the development and continued implementation of the overall EMS program to achieve its intended outcome.</td>
</tr>
<tr>
<td>Chief Operations Officer</td>
<td>Assures commitment to continual improvement in environmental performance.</td>
</tr>
<tr>
<td></td>
<td>Supports the development and continued implementation of the overall EMS program within the Metro operations to achieve its intended outcome.</td>
</tr>
<tr>
<td></td>
<td>Works together with EMS Administrator in ensuring the EMS SOPs at facilities are established, maintained, and followed.</td>
</tr>
<tr>
<td>Role</td>
<td>Description of EMS Responsibilities</td>
</tr>
<tr>
<td>--------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **Executive Officer, Environmental Compliance and Sustainability** | Acts as EMS Administrator and is responsible for agency-wide implementation of EMS (i.e., Executive Sponsor)  
Assures commitment to continual improvement in environmental performance.  
Supports the development and continued implementation of the overall EMS program to achieve its intended outcome.  
Ensures Metro activities meet the environmental obligations and policy standards.  
Ensures the EMS SOPs at Metro facilities are established, maintained, and followed.  
Ensures integration of the EMS program into Metro’s business processes as applicable |
| **Chief Project Management Officer**                               | Supports the development and continued implementation of the overall EMS program to achieve its intended outcome.  
Assures commitment to continual improvement in environmental performance.  
Works together with EMS Administrator in ensuring that construction activities meet the environmental obligations and policy standards.                                                                                       |
| **STAFF WITH CENTRALIZED FUNCTIONS**                              |                                                                                                                                                                                                                                     |
| **Talent and Development**                                          | Maintains centralized training record database.                                                                                                                                                                                      |
| **Risk, Safety and Asset Management – Corporate Safety**           | Maintains centralized emergency response plans pertaining to hazardous materials and hazardous materials business plans, as needed.  
Documents procedures and SOPs pertaining to agency wide safety.  
Coordinate Metro’s response to regulatory agencies compliance inspection regarding hazardous materials and Air Quality  
Conducts hazardous material training.  
Member of the EMS Administrative Team.                                                                                     |
| **Quality Assurance/Environmental Compliance and Services**        | Maintains centralized records pertaining to compliance with hazardous waste management.  
Documents procedures and SOPs pertaining to agency wide environmental compliance and hazardous waste management.  
Member of the EMS Administrative Team.                                                                                   |
<table>
<thead>
<tr>
<th>Role</th>
<th>Description of EMS Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Procurement and Material Management</strong></td>
<td>Maintains centralized contracts for Metro contractors, suppliers and vendors. Member of the EMS Administrative Team.</td>
</tr>
<tr>
<td><strong>Information Technology Systems</strong></td>
<td>Maintains centralized electronic access to all EMS documents. Provides overall electronic data management support of the EMS.</td>
</tr>
<tr>
<td><strong>FACILITYLEVEL PERSONNEL</strong></td>
<td></td>
</tr>
<tr>
<td>Facility Manager (EX: Maintenance Manager, Transportation Manager, Environmental Construction Compliance Manager)</td>
<td>Maintains facility records pertaining to compliance, training, calibration logs, and emergency response. Documents EMS SOPs pertaining to their department. Implements and verifies corrective and preventative action plans when required. Communicates facility-level feedback on EMS to the Core Team. Member of EMS Facility Core Team. Ensures compliance with contract specifications and local, state, federal and other regulations</td>
</tr>
<tr>
<td><strong>Supervisor</strong></td>
<td>Communicate employee feedback on EMS to the facility manager. Communicate EMS SOPs to the employees of their respective areas. Ensure that employees in their respective areas have the training and tools to meet the requirements of the procedures. May be a member of EMS Facility Core Team.</td>
</tr>
<tr>
<td>Role</td>
<td>Description of EMS Responsibilities</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **Local Site Safety Committees** | Accessing and maintaining the Emergency Site Plan listed above, and revision of the site-specific sections following the occurrence of a reportable spill or emergency situation or other, as needed.  
Maintaining the site specific appendices of the Emergency Site Plan.  
Coordinating site emergency drills and completing documentation of site emergency drills. |
| **Employee/Contractor**  | Perform assigned tasks in accordance with regulations, EMS standards, and EMS SOPs.  
Communicate concerns to the supervisor regarding the performance of tasks, in accordance to the above listed requirements.                                                                                                 |
| **EMS SPECIFIC ROLES**   |                                                                                                                                                                                                                                      |
| **EMS Administrator**    | Provides overall oversight of the EMS in coordination with executives of participating LA Metro business units.  
Develops, implements, and maintains Metro’s EMS.  
Assigns, manages and participates on the EMS Administrative Team.  
Ensures activities meet the environmental regulations, permit conditions, terms, and policy standards.  
Ensures EMS Procedures and SOPs are established and maintained.  
Represents the Environmental Compliance and Sustainability Department.  
Ensures overall maintenance of the Metro’s EMS, including the update and maintenance of:  
  - EMS Policy  
  - EMS Administrative Environmental Procedures  
  - EMS Administrative Environmental Documents and Forms  
  - Environmental Aspects and Significant Aspects  
  - Evidence of progress towards environmental objectives  
  - Environmental Management Programs  
  - Environmental Department SOPs  
Reviews non-conformances generated by the internal audit process.  
Implements and verifies corrective and preventive action plans when required.  
Participates in EMS Administrative Team meetings, internal audits and surveillance audits.  
Communicates the status of the EMS to the Top Management for the purposes of improvement. |
<table>
<thead>
<tr>
<th>Role</th>
<th>Description of EMS Responsibilities</th>
</tr>
</thead>
</table>
| **EMS Administrative Team (AKA Admin Team)** | - Develops, implements, and maintains Metro’s EMS.  
- Determines external and internal issues that relevant to achieve Metro’s intended outcome  
- Determine Metro’s Interested parties, needs and expectation, and compliance obligations  
- Ensures activities meet the compliance obligations, and policy standards.  
- Participates in maintaining EMS Administrative Procedures, Documents and Forms.  
- Assists in identifying and ranking Environmental Aspects and Significant Aspects.  
- Participates in developing and implementing centrally managed environmental objectives and action plans.  
- Maintains Monitoring and Measurement tracking for centrally managed action plans.  
- Implementing and verifying corrective and preventative actions when required.  
- Participates in EMS Administrative Team meetings, internal audits and surveillance audits.  
- Communicating the status of the EMS to Top Management for the purpose of continual improvement.  
- The team includes:  
  - Environmental Compliance and Sustainability Department  
  - Corporate Safety  
  - Quality Assurance  
  - Rail Operations  
  - Bus Maintenance  
  - Bus and Rail Transportation  
  - Homeland Security  
  - Procurement and Material Management  
  - Facilities Management  |
| **EMS Implementation Coordinator**         | - Assists Metro facilities with implementing Metro EMS  
- Coordinates with the EMS Administrator and the EMS Administrative Team; operates as designee for both.  
- As EMS Administrator and Administrative Team designee, acts as liaison between Facility Core Team and the Administrative Team.  
- Develops and utilizes Metro EMS implementation strategy and materials.  
- (depending on the size, there may be more than one EMS implementation coordinator)  |
<table>
<thead>
<tr>
<th>Role</th>
<th>Description of EMS Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMS Facility Core Team (AKA Core Team, a Core Team can be formed in either Operations EMS or Construction EMS)</strong></td>
<td>Develops, implements, and maintains Metro’s EMS at the facility level. Ensures facility activities meet the environmental commitment, environmental regulations, permit conditions, terms, and policy standards. Participates in maintaining EMS facility specific forms and records. Assists in identifying and ranking Environmental Aspects and Significant Aspects. Participates in developing and implementing facility specific environmental objectives, if appropriate, and action plans. Maintains Monitoring and Measurement tracking for facility specific action plan and other action item progress on significant aspect controls. Implementing and verifying corrective and preventative actions when required. Participates in EMS Administrative Team meetings, internal audits and surveillance audits, when appropriate.</td>
</tr>
</tbody>
</table>

**GENERAL ROLES**

<table>
<thead>
<tr>
<th><strong>Top Management</strong></th>
<th>Consists of Executive Officers and above who will be coordinating with the EMS Administrator in the participation of their staff for the implementation of the LA Metro EMS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contract Administrator</strong></td>
<td>Consist of personnel that review external provider contract and services in coordination with Metro’s EMS</td>
</tr>
</tbody>
</table>

Source:
LA Metro Roles and Responsibilities CEMS 5.0-2 ED Roles and Responsibilities Matrix
Contact: Dr. Cris B. Liban, P.E., ENV SP Executive Officer, Environmental Compliance and Sustainability
One Gateway Plaza, Los Angeles, CA
Phone: 213/922-2471
Email: LibanE@metro.net
MTA Cromwell Light Rail Station Facility ED-1-5.3-2 Organizational Roles, Responsibilities and Authorities (RRA) Matrix

<table>
<thead>
<tr>
<th>Title/Position/Role/Job Description</th>
<th>RRA in the ESMS</th>
</tr>
</thead>
</table>
| MTA ADMINISTRATOR                  | • Responsible for approving and endorsing the MTA Environmental Policy.  
|                                    | • Responsible for assuring all department areas are committed to continual improvement in environmental performance.  
|                                    | • Responsible for support of the development and continued implementation of the overall ESMS program.  
|                                    | • Participation in Management Reviews of the ESMS. |
| CHIEF SAFETY OFFICER, OFFICE OF SAFETY, QUALITY ASSURANCE AND RISK MANAGEMENT | • Serves as the senior management representative on the ESMS Team.  
|                                    | • Responsible for communicating ongoing status of the ESMS to the MTA Administrator.  
|                                    | • Responsible for supporting all departmental areas in their commitment to continual improvement in environmental performance.  
|                                    | • Participation in Management Reviews of the ESMS.  
|                                    | • Responsible for overseeing the development and implementation of the ESMS.  This includes the update and maintenance of:  
|                                    | (1) The Environmental Policy  
|                                    | (2) Environmental Aspects and Significant Aspects  
|                                    | (3) Maintenance of Compliance Obligations  
|                                    | (4) Evidence of progress towards Objectives  
|                                    | (5) Environmental Actions  
|                                    | (6) Environmental Department Procedures  
|                                    | (7) Environmental Compliance Manual  
|                                    | (8) Pollution Prevention Plan  
<p>|                                    | (9) Forms and Environmental Records |</p>
<table>
<thead>
<tr>
<th>Title/Position/Role/Job Description</th>
<th>RRA in the ESMS</th>
</tr>
</thead>
</table>
| MTA ENVIRONMENTAL MANAGER          | • Responsible for administering the ESMS at the operational level on a day-to-day basis.  
                                          • Responsible for supporting all departments in their commitment to continual improvement in environmental performance.  
                                          • Responsible for supporting the development and continued implementation of the overall ESMS program within the Cromwell Facility’s Operations.  
                                          • Participation in Management Reviews of the ESMS.  
                                          • Responsible for ensuring the MTA Environmental Group’s activities comply with applicable EPA and MDE regulations.  
                                          • Responsible for compliance and administering and maintaining the ESMS long-term.  
                                          • Responsible for ensuring ESMS Procedures are developed, maintained, and followed.  
                                          • Responsible for reviewing non-conformances generated by the internal audit process. Responsible for implementing and verifying corrective and preventive action plans when required.  
                                          • Responsible for communicating the operational status of compliance efforts and the ESMS to the Chief Safety Officer, Office of Safety, Quality Assurance, and Risk Management.  
                                          • Responsible for assigning tasks to the Environmental Analysts and ensuring performance.  
                                          • Responsible for developing, reviewing, and updating environmental training materials.  
                                          • Responsible for ensuring complete training of employees in the environmental policy, procedures and SOPs as specified in the training procedures.  
                                          • Responsible for conducting site visits to ensure operational and ESMS compliance.  
                                          • Responsible for communicating MTA’s Environmental Policies to other MTA Divisions and for ensuring that MTA Divisions make contract personnel aware of MTA’s Environmental Policies. |
| MANAGER INTERNAL COMPLIANCE DEPARTEMENT SERVICE QUALITY DIVISION | • Responsible for ensuring personnel attend training in MTA environmental policies and Standard Operational Procedures (SOPs) pertaining to maintenance activities (handling, shipping and receiving, and hazardous waste handling).  
                                          • Responsible for assuring delivery, transport, handling and storage of all materials on-site is done accordingly to regulatory guidelines, MTA policies/procedures, and ESMS requirements. |
| MANAGER, ENVIRONMENTAL PLANNING | • Responsible for incorporation of regulatory requirements, MDOT directives and ESMS requirements into the planning phase of projects at MTA facilities.  
                                          • Facilitates internal communication of ESMS elements in accordance with the Internal and External Communication Procedures.  
                                          • Communicates new sustainability initiatives, and provides updates on current initiatives to the Environmental Manager for incorporation into the ESMS. |
| DIRECTOR, OPERATIONS SUPPORT | • Responsible for ensuring the Facility Engineering and Maintenance department activities are consistent with environmental regulations.  
                                          • Responsible to ensure the ESMS procedures and SOPs are established, maintained, and followed. |
| ESMS COORDINATOR(S) | • Responsible for reporting on the administrative status of the ESMS to the Chief Safety Officer, Office of Safety, Quality Assurance, and Risk Management.  
                                          • Technical QA/QC review of documents supporting the ESMS.  
                                          • Responsible for coordinating resources for contractor/consultant inspection/assessment efforts. |
<table>
<thead>
<tr>
<th>Title/Position/Role/Job Description</th>
<th>RRA in the ESMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Collaborates with the Chief Safety Officer and Environmental Manager regarding the content of environmental-specific training needs and programs.</td>
</tr>
<tr>
<td></td>
<td>• Maintains the integrity of the ESMS documents on the MTA Intranet site.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for the document control of the ESMS documents, forms and records on the Website.</td>
</tr>
<tr>
<td></td>
<td>• Liaison with other regulatory agencies as necessary on ESMS-related subject matter.</td>
</tr>
<tr>
<td>OSQARM Technical Support</td>
<td>• Responsible for representing the Office of Safety, Quality Assurance, and Risk Management during environmental and ESMS Team Meetings.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for facilitating the initial drafts of MTA’s procedures, SOPs and other elements of the ESMS for review/comment.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for regulatory consulting support for day-to-day operations and the ESMS Development and Implementation.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for generating ESMS Team meeting minutes.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for monitoring the ESMS development and implementation schedule.</td>
</tr>
<tr>
<td>CROMWELL LIGHT RAIL MAINTENANCE FACILITY SUPERVISORS</td>
<td>• Responsible for communicating employee feedback on the Environmental Policy and Training; and communicating pertinent procedures and SOPs to the employees of their respective area.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for ensuring employees in their respective areas have the training and tools to meet the requirements of the procedures and SOPs.</td>
</tr>
<tr>
<td>CROMWELL LIGHT RAIL MAINTENANCE FACILITY EMPLOYEES</td>
<td>• Responsible for performing their tasks in accordance with the regulations, the Environmental Policy, procedures and SOPs.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for communicating their concerns to the Supervisor regarding the performance of tasks, in accordance to the above listed requirements.</td>
</tr>
<tr>
<td>INTERNAL AUDITORS / AUDIT TEAM</td>
<td>• Responsible for following audit plans / schedules.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for conducting internal audits of the MTA against procedural requirements and the ISO 14001:2015 standard.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for reporting the results of the audits to the Chief Safety Officer, Office of Safety, Quality Assurance, and Risk Management.</td>
</tr>
<tr>
<td>ESMS CORE TEAM</td>
<td>• Responsible for developing / implementing the ESMS.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for representing each operational area during the ESMS Core Team Meetings.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for facilitating the initial drafts of Cromwell procedures, SOPs and other elements of the ESMS.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for promoting the ESMS at Cromwell and as appropriate, agency-wide.</td>
</tr>
<tr>
<td>ESMS WORKGROUP</td>
<td>• Responsible for implementing the ESMS.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for representing each operational area during the ESMS Workgroup Meetings.</td>
</tr>
<tr>
<td></td>
<td>• Responsible for promoting the ESMS at Cromwell.</td>
</tr>
</tbody>
</table>

Source: MTA, ED-10-5.3-2 Organizational Roles, Responsibilities and Authorities (RRA) Matrix
Contact: Robert Frazier, Environmental Manager
1515 Washington Boulevard, Baltimore, MD 21230
Phone: 410-454-7317
Email: rfrrazier@mta.maryland.gov
### 3.1.8 Developing Environmental Characteristics and Influences—MTA

Your organization will need to look at the environmental characteristics and influences specific to your operations. Consider a life cycle approach which will incorporate elements of your operations as inputs, throughputs, and outputs as they reflect environmental conditions such as affecting air quality or water quality, and quality of life for your community.

MTA provides an example for listing your environmental characteristics and MTA refers to them as aspects and impacts (ISO 14001:2015 terminology).

#### Significant Aspects and Impacts

The ESMS Core Team in conjunction with Cromwell supervisors and staff conducted a site survey of operations, reviewed work activities and identified and ranked environmental aspects at Cromwell. The team generated a list of 51 environmental aspects and performed a rating based on the criteria below:

- Frequency/probability of occurrence
- Regulatory requirements
- Severity of environmental effect of aspect
- Community concerns
- Operational controls

Aspects rated 12 or above (out of 20) were considered significant. A total of 25 aspects were deemed significant. However, based on existing on-going efforts, regulatory risk factors, and available funding, only the five (5) significant aspects listed below are being addressed in the first phase. The other significant aspects will be addressed in subsequent phases.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Process/Activity</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST Management</td>
<td>Exterior stationary; exterior mobile</td>
<td>Waste management (SW/UW/HW) Stormwater management Soil, groundwater, surface water</td>
</tr>
<tr>
<td>Exterior Materials</td>
<td>Exterior storage of materials for routine activities, exterior bulk storage of fluids/oils</td>
<td>Stormwater management Soil, groundwater, surface water</td>
</tr>
<tr>
<td>Storage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Dispensing</td>
<td>Exterior stationary; exterior mobile</td>
<td>Waste management (SW/UW/HW) Stormwater management Soil, groundwater, surface water</td>
</tr>
<tr>
<td>Spills/Releases</td>
<td>Equipment storage</td>
<td>Stormwater Soil, groundwater, surface water</td>
</tr>
<tr>
<td>Water Consumption</td>
<td>Routine facility activities/operations</td>
<td>Water treatment, Safe Drinking Water Act Groundwater, surface water</td>
</tr>
</tbody>
</table>

Source: FTA Final Report, MTA section, Page 25, 2017
Contact: Robert Frazier, Environmental Manager 1515 Washington Boulevard, Baltimore, MD 21230 Phone: 410-454-7317 Email: rfrrazier@mta.maryland.gov
3.1.9 Legal Requirements — LA Metro

Transit organizations are subject to a multitude of laws, regulations (including federal, state, regional and local rules) as well as international agreements that affect its operations.

Below is a homework excerpt from LA Metro from the 2016 ESMS Institute that provides an example of a good way to list requirements (only federal requirements are shown in the excerpt), determine what your organization must do, and track the reporting.

<table>
<thead>
<tr>
<th>Environmental Condition</th>
<th>Interested Parties</th>
<th>Subject Area</th>
<th>Relevant Needs and Expectations</th>
<th>Compliance Obligation</th>
<th>Reference Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Management</td>
<td>USEPA and TSDFs</td>
<td>Hazardous Waste (Resource Conservation and Recovery Act)</td>
<td>STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE</td>
<td>Subpart B - The Manifest Subpart C - Packaging, Labeling, Placarding, Accumulation Time Subpart D - Recordkeeping and Reporting</td>
<td>40 CFR 262</td>
</tr>
<tr>
<td>Resource Management</td>
<td>USEPA and Used Oil Recyclers</td>
<td>Used Oil</td>
<td>STANDARDS FOR THE MANAGEMENT OF USED OIL</td>
<td>Subpart C - Standards for Used Oil Generators</td>
<td>40 CFR 279</td>
</tr>
</tbody>
</table>

Source: LA Metro CEMS 4.0-1 ED Attachment B Version: 7/19/16
Contact: Dr. Cris B. Liban, P.E., ENV SP Executive Officer, Environmental Compliance and Sustainability
One Gateway Plaza, Los Angeles, CA
Phone: 213/922-2471
Email: LibanE@metro.net
3.1.10 Integrating ESMS into Agency Strategic Planning and Goals and Funding — LA Metro

A key element of making sure that your ESMS is contributing to the success of your organization is to ensure that the ESMS is aligned with your organization’s strategic plan and your mission. LA Metro developed a diagram to describe its processes and as a result was able to consider an integrated approach to link funding to planning, construction and operations.

Source: LA Metro, PPT Presentation, 5/27/16
Contact: Dr. Cris B. Liban, P.E., ENV SP Executive Officer, Environmental Compliance and Sustainability One Gateway Plaza, Los Angeles, CA
Phone: 213/922-2471
Email: LibanE@metro.net
3.1.11 Developing Goals and Targets

After you have developed a list of the characteristics and influences of your organization that you want to address, you need to establish goals and targets. An action plan needs to be developed for each goal and target to monitor that they will be achieved.

Examples related to developing goals, targets and action plans are provided below from MTA, TriMet, Bay Area Rapid Transit (BART) and Metropolitan Atlanta Rapid Transit Authority (MARTA). MTA, TriMet and MARTA refer to them as objectives (ISO 14001:2015 terminology).

### MTA

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Objective</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTs Management</td>
<td>Establish a tank management program to address all deficiencies and ensure compliance with newly enacted regulations.</td>
<td>Perform ASTs Baseline Assessment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prioritize ASTs repairs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review and update current standard operating procedures (SOPs).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review training procedures.</td>
</tr>
<tr>
<td>Exterior Materials Storage</td>
<td>Establish internal procedures to avoid deficiencies in regards to all applicable compliance obligations</td>
<td>Review and update current standard operating procedures (SOPs).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review training procedures.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review facility operations for additional items which require control.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review applicable compliance obligations and infrastructure for adequate control measures and additional operational BMPs.</td>
</tr>
<tr>
<td>Fuel Dispensing</td>
<td>Prevent the spill and release of fuels from dispensing activities into the surrounding soil, groundwater and surface water.</td>
<td>Review and update current standard operating procedures (SOPs).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review training procedures.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish a routine inspection and routine preventative maintenance (PM) program.</td>
</tr>
<tr>
<td>Spills and Releases</td>
<td>Prevent spills and releases of oils, fuels, and hazardous substances into the surrounding soil, groundwater and surface water.</td>
<td>Review and update current standard operating procedures (SOPs).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review training procedures.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review facility infrastructure for adequate control measures and availability and adequacy of spill kits/equipment and if equipment is adequately sized to handle the quantity and types of material stored at the facility.</td>
</tr>
<tr>
<td>Water Consumption</td>
<td>Reduce water consumption from domestic, industrial and landscaping activities.</td>
<td>Review water consumption documentation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evaluate facility functions for water saving opportunities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MTA is developing a water consumption reduction goal based out of their energy consumption plan</td>
</tr>
</tbody>
</table>

Source: FTA Final Report, MTA section, Page 28, 2017
Contact: Robert Frazier, Environmental Manager
1515 Washington Boulevard, Baltimore, MD 21230
Phone: 410-454-7317
Email: rfrazier@mta.maryland.gov
## TriMet

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Objectives</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemicals</strong></td>
<td>• Update internal online SDS database to comply with OSHA requirements regarding SDS, July 2019&lt;br&gt;• Identity chemicals that have not&lt;br&gt;been through the environmental and safety review, July 2019&lt;br&gt;• Identify which chemicals have environmentally responsible alternatives, July 2019&lt;br&gt;• Confirm standard operating procedures regarding chemical procurement and handling are in place, January 2018</td>
<td>• Review online SDS database&lt;br&gt;• Inventory chemicals to identify those that have not been through review&lt;br&gt;• Implement pilot project to test new products for effectiveness&lt;br&gt;• Implement staff training by January 2018&lt;br&gt;• Maintenance to include chemical action items or corrective actions (e.g. training, storage, spills, handling, use and disposal) on the staff meetings template</td>
</tr>
<tr>
<td><strong>Electricity</strong></td>
<td>• Conduct audit to identify potential building systems improvements at Elmonica by November 2017&lt;br&gt;• Create an energy conservation action plan to reduce electricity usage&lt;br&gt;• Conduct isolated monitoring of consumption for Elmonica building&lt;br&gt;• Implement staff training by June 2018</td>
<td>• Procure energy auditor&lt;br&gt;• Design and implement the conservation plan that will reduce electricity usage&lt;br&gt;• Define baseline electricity consumption data for gross meter and sub-meters measurement on a quarterly basis&lt;br&gt;• Analyze energy use projections with actual “before and after” consumption to determine change/progress toward Objective. Create and display YTD usage trending graph&lt;br&gt;• Update the staff of the conservation action plan at monthly meetings</td>
</tr>
<tr>
<td><strong>Natural Gas</strong></td>
<td>• Conduct audit to identify potential building systems improvements at Elmonica by November 2017&lt;br&gt;• Create an energy conservation action plan to reduce natural gas usage&lt;br&gt;• Conduct isolated monitoring of consumption for Elmonica building&lt;br&gt;• Implement staff training by June 2018</td>
<td>• Procure energy auditor&lt;br&gt;• Design and implement the conservation plan that will reduce natural gas usage&lt;br&gt;• Define baseline electricity consumption data for gross meter and sub-meters measurement on a quarterly basis&lt;br&gt;• Analyze natural gas use projections with actual “before and after” consumption to determine change/progress toward Objective. Create and display YTD usage trending graph&lt;br&gt;• Update the staff of the conservation action plan at monthly meetings</td>
</tr>
</tbody>
</table>

Source: FTA Final Report, TriMet section, Page 57, 2017
Contact: Kimberley Angove angovek@trimet.org 4012 SE 17th Ave, Portland, OR 97202
Phone: 503-962-4831
Email: angovek@trimet.org
Once you have determined your important environmental characteristics and influences, it is important to set specific targets to meet your ESMS goals. These need to be consistent with your ESMS goals, and you need to be able to measure them, assign staff to monitor them, communicate progress and update them as needed. Goals need to have some target or measure such as a percent reduction in fuel use by a specific time period. In some cases, it may take some time to determine the actual target numbers because you need to establish how and when you will measure (baseline).

After identifying general categories, as shown above, you can then develop a more comprehensive tool that identifies the measure, target, baseline and data source. Bay Area Rapid Transit (BART) has developed a tool that provides this information as it relates to its identified targets.

**BART DRAFT Environmental Objectives 7/6/16**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Target</th>
<th>Baseline (2013)</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Consumption</td>
<td>25% normalized Reduction by 2020?</td>
<td>59,142,116 Gal</td>
<td>Consumption analysis, Water Invoices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.877 Gal/mile</td>
<td></td>
</tr>
<tr>
<td>Energy Use</td>
<td>4% normalized reduction by 2020</td>
<td>1,393,221 GJ, 0.0207 GJ/mile</td>
<td>CAPTAC Model, Electricity Bills, Natural Gas Bills, Diesel and Gasoline Receipts</td>
</tr>
<tr>
<td>GHG Emissions</td>
<td>70% normalized reduction by 2020</td>
<td>152,979 MT CO2e, 2.27 kg-CO2e/mile</td>
<td>CAPTAC Model, Electricity Bills, Natural Gas Bills, Diesel and Gasoline Receipts</td>
</tr>
<tr>
<td>GHG Displacement</td>
<td>N/A</td>
<td>1,294,306 MT CO2e</td>
<td>APTA, TCRP-174</td>
</tr>
<tr>
<td>Solid Waste Diversion Rate</td>
<td>TBD</td>
<td>10% diversion*</td>
<td>Big Belly Pilot data, Waste Service agreements</td>
</tr>
</tbody>
</table>

*Based on waste service agreements*

Source: FTA/VT ESMS Institute Homework, BART, 2016
Contact: Bob Powers, General Manager, San Francisco BART
300 Lakeside Drive, Oakland, CA 94612
Phone: 510-464-6060
Email: generalmanager@bart.gov
MARTA chose to set objectives and targets for each significant aspect. These are described in the following table. Please note that in some cases training targets are set for subsequent/multiple dates as time is needed to rotate staff through training.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce the amount of phosphorus that is discharged from the facility to the IWTP.</td>
<td>Maintain concentration of phosphorus in effluent to IWTP at seven (7) milligrams per liter (mg/L) of phosphorus or less by September 2012.</td>
</tr>
<tr>
<td>Reduce chemical usage and total petroleum hydrocarbon (TPH) levels in IWTP.</td>
<td>Reduce the use of Metro Track Bed cleaner by 5% by January 2012. Maintain total petroleum hydrocarbon (TPH) in effluent less than 20 mg/L by January 2012.</td>
</tr>
<tr>
<td>Minimize waste generation and attain RCRA Conditionally Exempt Small Quantity Generator (CESQG) status for the facility.</td>
<td>Minimize hazardous waste generation from process by 5% by March 2012. Attain CESQG status by December 2012.</td>
</tr>
<tr>
<td>Comply with motor vehicle air conditioning (MVAC) Ozone Depleting Substances (ODS) requirements.</td>
<td>Attain 90% training for HVAC technicians by March 2012. Have fewer than five compliance findings for MVAC ODS requirements under 40 CFR 82 by March 2012. Attain 95% training for HVAC technicians by September 2012.</td>
</tr>
<tr>
<td>Comply with fluorescent universal waste requirements.</td>
<td>Attain 80% completion of training for Railcar Maintenance personnel by July 2012. Have 5 or fewer compliance findings for universal waste requirements under 40 CFR 273 / GA 391-3-11-.18 during March 2012 audit. Attain 100% completion of training for active staff of Rail Car Maintenance personnel by September 2012.</td>
</tr>
</tbody>
</table>

Source: FTA Final Report, MARTA section, Page 91, 2012
Contact: Reginald James, Director of Safety, Office of Safety
2424 Piedmont Road, NE, Atlanta, GA 30324-3311

3.2 IMPLEMENTATION (DOING)

3.2.1 Providing Competent, Knowledgeable Staff with the Tools to Develop, Implement and Maintain an ESMS

Well-trained staff is a hallmark of excellent organizations. Trained employees have higher morale levels, are more efficient and are less likely to make errors. For the purposes of an ESMS, it is important to train staff not only on their specific job tasks, but to ensure that they understand how their work and what they do fits into the ESMS program, or in other words, they are knowledgeable. Several examples are provided below by Southeastern Pennsylvania Transportation Authority (SEPTA) and SORTA.

The SEPTA example demonstrates the organization's approach to training its employees. Please note that different types of training are identified as each has its own relevant focus.
The SORTA example below demonstrates the organization's approach to training its employees. Please note that different types of training are identified as each has its own relevant focus.

5.1 **The Annual ESMS Training Plan will be divided into four categories:**

5.1.1 **General ESMS Awareness** - basic EMS training including New Employee Orientation;

5.1.2 **Job-Specific ESMS Training** - Significant Aspects & Operational Control (Work Instructions);

5.1.3 **Emergency and Regulatory-Required Training** - Responders or apt to be exposed to an emergency situation

5.1.4 **Contractor ESMS Training** – for approved Contractors/Suppliers/Vendors.

5.2 **General ESMS Awareness**

5.2.1 The initial EMS **General ESMS Awareness** training is given to all employees of the Queensgate Facility. The EMS Management Representative and the HR department will coordinate and conduct the training.

5.2.2 New employees of the Queensgate Facility are given **General ESMS Awareness** training as part of the new employee orientation.
5.2.3 Ongoing General ESMS Awareness training will be conducted according to the Annual EMS Training Plan and will include training on the Queensgate Facility’s:
   a) Environmental Policy;
   b) significant Aspects and environmental impacts of work activities;
   c) relevant Objectives, Targets and Programs;
   d) roles and responsibilities;
   e) general EMS performance;
   f) environmental benefits of improved personal performance;
   g) potential consequences of departure from operating procedures;
   h) emergency preparedness and response requirements.

5.3 Job-Specific ESMS Training

5.3.1 All employees whose work may create a significant impact on the environment must have the necessary skills, experience, and awareness to perform their duties in a manner that conforms to the Environmental Policy, Procedures and Work Instructions, under normal, abnormal and emergency working conditions.

5.3.2 Job-Specific ESMS Training for Operational Control (Work Instructions) is monitored and tracked by the EMS Management Representative and coordinated with the HR department.

5.3.3 Supervisors will conduct Job-Specific ESMS Training on the Work Instructions for the employees under their supervision. The Supervisors will train their employees using training subject matter and material approved and/or provided by the EMS Management Representative. Supervisors will ensure that Job-Specific ESMS Training is effective and relevant for employees whose work may create a significant environmental impact.

5.3.4 Supervisors shall determine and schedule Job-Specific ESMS Training for their employees upon initial assignment, reassignment to new duties and responsibilities, assignment of new tasks, or annually as appropriate.

5.4 Emergency and Regulatory-Required Training

5.4.1 All employees who are directly involved in responding to an emergency situation or require regulatory training must have the necessary skills, experience, and awareness to carry out the environmental activity.

5.4.2 Employees who are directly involved in responding to an emergency situation or who are more apt to be exposed to an emergency situation, as identified in the EP-8.2-1 Emergency Preparedness and Response Procedure, will receive the necessary and required training per the specific emergency plans.

5.5 Contractor ESMS Training

5.5.1 Approved contractors, suppliers and vendors working on projects that involve significant environmental aspects on behalf of the Queensgate Facility will be briefed on the SORTA Metro ESMS; Environmental Policy; relevant Objectives and planning to achieve them; and appropriate Work Instructions. Contractor communication, briefings and training will be documented.

Source: FTA/VT ESMS Institute Homework, SORTA, 2017
Contact: T J Thorn, OHST, TSSP, Vice President, Safety and Security/Chief Safety Officer
1401 Bank Street, Cincinnati, OH 45214-1737
Phone: 513-632-7651
Email: tjthorn@go-metro.com
In order to ensure that training is documented and management has evidence that staff have been trained, recordkeeping is essential to your system. SORTA provides an excellent example below of a record to document training.

<table>
<thead>
<tr>
<th>Verification</th>
<th>Originator</th>
<th>Revised</th>
<th>Approved</th>
<th>Issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initials</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental Document

**ED-7-2 (F) Training Sign-in Sheet**

Refer to EP-7 (7.1, 7.2, and 7.3) Support: Resources, Competence & Awareness Procedure for detailed instructions regarding this ESMS form/record.

<table>
<thead>
<tr>
<th>Training Class Subject:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructor / Supervisor:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date and Time:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Print Name</th>
<th>Initials</th>
<th>Department</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Completed forms and related attachments are records maintained in the ESMS; route to the ESMS Designated Personnel

Source: FTA/VT ESMS Institute Homework, SORTA, 2017 — Excerpt from procedure EP-7 (7.1, 7.2, 7.3) Support: Resources, Competence, Awareness dated 8/21/16
Contact: T J Thorn, OHST, TSSP Vice President, Safety and Security/Chief Safety Officer
1401 Bank Street Cincinnati, OH 45214-1737
Phone:513-632-7651
Email: tjthorn@go-metro.com
SORTA also provides an excellent example of a training matrix. As you can see the Training Categories (Awareness/Job Specific) are listed in the left-hand column and the Personnel/Timing (Schedule) and documentation appear in the top rows. The matrix also includes a risk assessment associated with the training.

<table>
<thead>
<tr>
<th>Training</th>
<th>Personnel</th>
<th>Timing</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS Awareness</td>
<td>1 3 3 3 2 2</td>
<td>Initial implementation of EMS. Determine need for refresher annually.</td>
<td>Personnel records, Sign-in sheets, Agenda, Trainers notes, Meeting minutes</td>
</tr>
<tr>
<td>Significant Aspects</td>
<td>1 3 3 3 2 2</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
<tr>
<td>New Employee Orientation</td>
<td>1 1 1 1 1 1</td>
<td>When person is initially hired</td>
<td>Same as above</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job-Specific EMS Training</th>
<th>Personnel</th>
<th>Timing</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipment Hazardous Waste Off Site</td>
<td>1 2 2 2 2 2</td>
<td>Prior to assuming job responsibilities; then periodically</td>
<td>Personnel records, Sign-in sheets, Agenda, Trainers notes, Meeting minutes</td>
</tr>
<tr>
<td>Handling and Disposal of Hazardous Waste</td>
<td>1 3 3 3 3 3</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
<tr>
<td>Removing Gasoline from Vehicles for Maintenance</td>
<td>1 3 3 3 2 2</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
<tr>
<td>Disposal of Fuel Filters</td>
<td>1 3 3 3 1 2</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
<tr>
<td>Maintenance of Vehicle Air Conditioners</td>
<td>1 2 2 3 2 2</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Training</th>
<th>Personnel</th>
<th>Timing</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance of Facility Air Conditioners</td>
<td>1 3 2 2 1 1</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
<tr>
<td>Paper and Cardboard Recycling</td>
<td>2 2 2 2 2 2</td>
<td>Prior to assuming job responsibilities; then periodically</td>
<td>Personnel records, Sign-in sheets, Agenda, Trainers notes, Meeting minutes</td>
</tr>
<tr>
<td>EMS Electronic Access</td>
<td>1 1 1 1 1 1</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
<tr>
<td>Train-the-Trainer</td>
<td>1 1 1 1 1 1</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency and Regulatory-Required Training</th>
<th>Personnel</th>
<th>Timing</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous Waste Management</td>
<td>1 3 3 3 1 2</td>
<td>Prior to assuming job responsibilities; annual update</td>
<td>Statement of training, Personnel records, Sign-in sheets</td>
</tr>
<tr>
<td>Transportation of Hazardous Materials</td>
<td>1 3 3 3 1 3</td>
<td>Same as above</td>
<td>Same as above</td>
</tr>
<tr>
<td>Others (TBD)</td>
<td></td>
<td></td>
<td>Same as above</td>
</tr>
<tr>
<td></td>
<td>Risk Level</td>
<td>Probability</td>
<td>Severity</td>
</tr>
<tr>
<td>---</td>
<td>------------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Risk Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Probability</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>EMS Requirements: Env. Policy; Objectives &amp; Targets; Work Instructions. Refer to Contractor Management Procedure</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>26</td>
<td>Risk Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Probability</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>28</td>
<td>Severity</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: FTA/VT ESMS Institute Homework, SORTA, 2017
Contact: T J Thorn, OHST, TSSP, Vice President, Safety and Security/Chief Safety Officer
1401 Bank Street, Cincinnati, OH 45214-1737
Phone: 513-632-7651
Email: tjthorn@go-metro.com
### 3.2.2 Effective System for Communicating

An effective system of communicating consists of the methods that an organization can use to both obtain and disseminate information about its performance, ensure compliance with regulatory requirements, and notify top management as well as employees regarding the status of the organization’s operations. An effective system of communicating includes, and is not limited to, multiple forms and may include meetings, written instructions and reports, e-mail, text, training, standard operating procedures (SOPs), posters, banners, websites, and conferences. MTA and SORTA provide some examples of effective communication systems below.

MTA documents the procedures in which the ESMS will be communicated to those inside and outside the organization.

**Communication Product Examples:**

EP 7.4-1 documents the procedures in which communication of the Environmental and Sustainability Management System (ESMS) will be communicated to internal and external parties. The following are examples of products that will be tailored for the Cromwell Light Rail Maintenance Facility.

Posters (see attached for example):

- Posters will be posted throughout the facility to highlight what ESMS is and what are the significant aspects for the facility.

Letters to contractors (sample letter attached):

- The attached sample letter will be sent to contractors to inform them of the ESMS and that they are to comply with all federal, state and local regulations.

**Toolbox Meetings:**

- To effectively communicate with staff, the Core Team will relay topics to be discussed at Toolbox meetings that are held at the beginning of each shift. The topics will highlight various ESMS elements and aspects. Attendance is taken at these meetings and the roster will be documented according to EP 7.4-1.

**Safety Meetings:**

- Core Team members will attend monthly safety meetings with light rail staff to continue the ESMS messaging. The Safety meetings will also be used as way to receive input on communication materials to see if they are effective for staff. Attendance is taken at these meetings and the roster will be documented according to EP 7.4-1.

**Intranet** (See attached for example):

- ESMS information will be posted on the MTA intranet on the TIGERS page. The page will include the Environmental Procedures, work products, and educational material.

Source: FTA/VT ESMS Institute Homework, MTA, 2017 - 7.4-1 Communication Process
Contact: Robert Frazier, Environmental Manager
1515 Washington Boulevard, Baltimore, MD 21230
Phone: 410-454-7317
Email: rfrazier@mta.maryland.gov
The following are examples of communication products that SORTA identified that are used within its ESMS.

**External**

- Vehicle Decals
- Place legal ad
- Go Info newsletter
- Website
- Green Umbrella post
- Social media, PR
- Media event – EPA, FTA, city officials
- Small placard signs for garages in yards

**Internal**

- “Metro Express” employee newsletter
- “Drive” employee newsletter
- “The Recycler” employee e-news
- Ridership partners monthly announcement
- Quarterly sustainability outreach and education events
- Counter signs at clerks and receptionists areas
- Screen savers
- Posters
- Framed 11 X 17 hung with official documents
- Videos

Source: FTA/VT ESMS Institute Homework, SORTA, 2017
Contact: T J Thorn, OHST, TSSP, Vice President, Safety and Security/Chief Safety Officer
1401 Bank Street, Cincinnati, OH 45214
Phone: 513-632-7651
Email: tjthorn@go-metro.com
3.2.3 Planning and Managing Emergencies — PAAC
Organizations must have an Emergency Response Plan to protect against adverse environmental impacts. In most cases, existing emergency plans may be used with slight modification to meet the requirements of an ESMS. The organization’s staff needs to be well trained and the organization needs to conduct periodic tests to assure that the system is working and that any shortcomings identified as a result of the test are addressed. In some cases, the plan will need to be revised, SOPs changed, and additional staff training provided to affected personnel. The Port Authority of Allegheny County (PAAC) provides an excellent example of a hypothetical, yet possible, emergency event at a Light Rail Transit station that includes an evaluation of the event and recommendations for improvements.

Emergency Response – PAAC Emergency Preparedness & Response Test Trials (and Tribulations)
Light Rail Transit

LRT Station Emergency Event

- At 1030 hours the “MSA Safesite” chemical detection system went into alarm VOC sensor at 25 ppm.
- HVAC repair person notified Subway Maintenance Supervisor a 55 gallon drum of caustic cleaning solvent had fallen into the trackway at the station and is leaking into a sewer.
- At 1033 hours an additional VOC 25 ppm alarm from another sensor at Steel Plaza. At 1035 hours the initial sensor alarm reading increased to 50 ppm.
- Chemical detection alarms are only audible and the readings available at the Pitt Tower Police Station.

Analysis of Event

- A Record of the response conducted was generated by the police dispatcher and event recorded in the Daily Occurrence Report (DOR).
- Initial notifications and proper procedures for the Chemical Detection System Activation were followed at the beginning of the exercise.
- All Light Rail Vehicles held from entering the station.
- Public address announcement the station is closing.
- Control of the scene relinquished to Police and County Hazmat Response.

Suggestions for Improvement

- Amend the Chemical Detection System procedure to notify ECC in the event of a spill with the potential to enter the sewer system.
- Add shutdown of main discharge sump pumps to sewer system during a spill event to response procedure.

Source: FTA/VT ESMS Institute, 2016, PAAC Emergency Response Drill 2.pdf
Contact: 345 Sixth Ave, 3rd Floor, Pittsburgh, PA 15222
### 3.3 MAINTENANCE (CHECKING/ACTING)

#### 3.3.1 Examination, Investigation, Evaluation

The organization is responsible for tracking the effectiveness of implementation and this can best be achieved by examining, investigating and evaluating what is taking place. Once goals and targets are set, monitoring progress tells you how effective you are in meeting those goals and targets. Be sure to include calibration of equipment as properly calibrated equipment will accurately reflect your progress and ensure that there will be no regulatory violations. Examination, investigation, and evaluation information also allows you to adjust the resources allocated to the goal in order to meet your targets. This could include more money, staff or materials.

**CapMetro**

Capital Metro provides an example of how to set up your examination, investigation and evaluation program to ensure that staff are trained on their roles to achieve the targets set in the organization’s goals. Note, the process involves the identification of calibration needs. Capital Metro refers to objectives, aspects, and monitoring and measurements (ISO 14001:2015 terminology).

1. **Vehicle Idling Reduction**
2. **Water Use Reduction**

   - Once the procedures were developed, we then developed the monitoring & measurement sections based on our objectives, targets and programs.

   - We used the significant aspects rating lists to provide direction on tracking our success.

   - The next step was to develop the calibration log base on current items that calibration was required.

   - Finally we developed a power point presentation to help with awareness and training requirements.

**SOURCE:** FTA/VT ESMS Institute Homework, Capital Metro, 2012
Contact: 2910 E. 5th St., Austin, TX. 78702
Phone: Customer Service GO Line: 512-474-1200
Website: [www.capmetro.org](http://www.capmetro.org)

**MTA Cromwell Light Rail Station Facility**

MTA provides an example for evaluating how your examination, investigation and evaluation program is working. The primary goal here is to identify what is working and what is not working. Next, corrective action steps need to be established as well as assignments and resources made available to accomplish the tasks. Recordkeeping is emphasized because it is the primary means by which an organization can provide evidence of action. MTA refers to significant aspects and monitoring and measurement (ISO 14001:2015 terminology).
ED-10-9.1 Monitoring and Measurement Annual Evaluation Form

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Yes/No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Have all of the operations and activities, compliance obligations, and objectives for each significant aspect been identified?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Were monitoring and measurement types effective for ensuring SOPs were implemented? If not, identify issues in the Comments section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Were monitoring and measurement types effective for ensuring compliance obligations were met? If not, identify issues in the Comments section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Are additional monitoring and measurement types needed? If yes, describe in the Comments section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Have there been any operational or equipment changes that affect the monitoring and measurement or calibration for significant aspects? If yes, describe in the Comments section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Have there been any equipment or operational changes which would require updates to the SOPs? If yes, describe in the Comments section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Has senior management been made aware of needs, resources, etc.?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant Aspect: Tank Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Have all records and information been retained in order to effectively and accurately evaluate the criteria established in Section 9.1 Monitoring and Measurement?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant Aspect: Water Conservation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Have all records and information been retained in order to effectively and accurately evaluate the criteria established in Section 9.1 Monitoring and Measurement?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant Aspect: Compressed Gas Storage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Have all records and information been retained in order to effectively and accurately evaluate the criteria established in Section 9.1 Monitoring and Measurement?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3.3.2 Examination, Investigation, Evaluation — Calibration

**BART**

BART provides an example to show its steps for conducting the calibration process including the calibration of equipment, responsibilities and recordkeeping.

#### 9.1 Calibration/Preventative Maintenance Log Template

<table>
<thead>
<tr>
<th>Process for calibration of equipment, responsibilities and record keeping:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Competent Person</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Supervisor</strong></td>
</tr>
</tbody>
</table>
| | 4.0 | For calibration by outside vendor:  
| | | • Submit requisition for calibration to the **Purchasing Department**.  
| | | • Coordinate the release of the device to the **vendor**.  
| | | • Upon eventual return of the calibration device and associated paper work, **go to step 8** of this outline. |
| | 5.0 | For in-house calibration: **assign** calibration job to qualified personnel |
| **Qualified Personnel** | 6.0 | **Calibrate device.** Fill in requested information of the calibration record form. (Organization and equipment specific form) |
| | 7.0 | Return calibrated device and completed form to the Competent Person. |
| **Competent Person** | 8.0 | **Review** the calibration record form and other documents, as appropriate, and then **sign approval** on the form. If calibration was not achieved or was not adequate, suspend reinstallation or reuse of the device until the situation is resolved. |
| | 9.0 | If a piece of test equipment is found to be **out of calibration**, review the calibration records. Schedule **recalibration** of any instruments calibrated using the test unit in question. |
| **Administrative** | 10.0 | **File and maintain calibration record forms.** Retain records in accordance with 7.5.3 Control of Documented information |
### Equipment Calibration/Preventative Maintenance Log

<table>
<thead>
<tr>
<th>Location of Equipment</th>
<th>Equipment Name</th>
<th>Brand Name or Make</th>
<th>Model or Serial #</th>
<th>Calibration/Preventative Maintenance Frequency</th>
<th>Method of Calibration</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>M90 (Example)</td>
<td>PG&amp;E Electricity Meter at 421 John Daly Blvd, Daly City 94014</td>
<td>Unk</td>
<td>Unk</td>
<td>Last tested on 1/12/2014; Will be scheduled this year 2017</td>
<td>Standards for Meter Installation, Maintenance, Testing and Calibration</td>
<td>Calibration conducted by PG&amp;E as responsible party</td>
</tr>
<tr>
<td>M90</td>
<td>PG&amp;E Electricity Meter at 421 John Daly Blvd, Daly City 94014</td>
<td>Unk</td>
<td>Unk</td>
<td>Last tested on 1/12/2014; Will be scheduled this year 2017</td>
<td>Standards for Meter Installation, Maintenance, Testing and Calibration</td>
<td>Calibration conducted by PG&amp;E as responsible party</td>
</tr>
</tbody>
</table>

Source: FTA/VT ESMS Institute Homework, BART, 2016  
Contact: Bob Powers, General Manager, San Francisco BART  
300 Lakeside Drive, Oakland, CA 94612  
Phone: 510-464-6060  
Email: generalmanager@bart.gov

**MTA**

MTA provides an excellent example of what a tracking matrix might look like to establish clear evidence that your calibration program is effective. Please note that the rows and columns are very specific — each piece of equipment is identified by brand and serial number, as well as the frequency of calibration needed and the person responsible. Finally, the last date of calibration is listed so that the responsible person can determine the schedule to make sure the equipment is ready for service.
<table>
<thead>
<tr>
<th>Equipment ID or Location of Equipment</th>
<th>Equipment Name</th>
<th>Brand Name or Make</th>
<th>Model or Serial No.</th>
<th>Calibration Frequency</th>
<th>Calibration Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overfill prevention devices</td>
<td>All equipped ASTs</td>
<td>Multiple</td>
<td>Multiple</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>6,000 gallon AST</td>
<td>Diesel Dispenser</td>
<td>Gasboy</td>
<td>9852AXD</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>6,000 gallon AST</td>
<td>Diesel Dispenser Leak Detection</td>
<td>Gasboy</td>
<td>Unknown</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-3, C-4, C-5, C-6, C-7, C-8, C-9, C-10, C-11, C-12</td>
<td>Warrick Control Alarm Panel</td>
<td>Warrick Controls (Gems Sensors)</td>
<td>7880087</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-3, C-4, C-5, C-6, C-7, C-8, C-9, C-10, C-11, C-12</td>
<td>Liquid Level Sensor</td>
<td>Warrick Controls (Gems Sensors)</td>
<td>Multiple</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-4, C-7, C-10</td>
<td>Interstitial Leak Detection Sensor</td>
<td>Warrick Controls (Gems Sensors)</td>
<td>DLP-1</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-4, C-6</td>
<td>Pneumatic Level Control Valve (Overfill Prevention)</td>
<td>Balcrank</td>
<td>4520-001</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-25, C-26, C-27, C-28</td>
<td>Level Sensor</td>
<td>Multiple</td>
<td>Multiple</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-19</td>
<td>Low Fuel Level Sensor</td>
<td>Kohler</td>
<td>Unknown</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-19</td>
<td>Interstitial Leak Detection Sensor</td>
<td>Kohler</td>
<td>Unknown</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-19</td>
<td>Emergency Shut-Off Switch</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-19</td>
<td>Liquid Level Gauge</td>
<td>Rochester Gauges</td>
<td>6500 Series</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-13</td>
<td>Liquid Level Clock Gauge</td>
<td>Morrison Brothers</td>
<td>Figure 818</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-13</td>
<td>Liquid Level Sensor</td>
<td>Veeder-Root</td>
<td>Unknown</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
<tr>
<td>C-13</td>
<td>Interstitial Leak Detection Sensor</td>
<td>Veeder-Root</td>
<td>794390</td>
<td>Annual</td>
<td>MTA Environmental Manager</td>
</tr>
</tbody>
</table>

Source: FTA/VT ESMS Institute Homework, MTA, 2016
Contact: Robert Frazier, Environmental Manager
1515 Washington Boulevard, Baltimore, MD 21230
Phone: 410-454-7317
Email: rfrrazier@mta.maryland.gov
3.3.3 Appraisal of the ESMS — SORTA

In order to improve operations, it is important to conduct internal assessments to independently evaluate the performance of your ESMS. An internal assessment team needs to be created that will consist of members of your own organization. This team will check to see that what has been stated in your ESMS is, in fact, being done. A phrase often stated in many organizations is “Trust, But Verify.” One of the more difficult elements of conducting an internal assessment involves what to do when the assessment is completed. You must define the steps needed to convey the findings and what is done with the findings afterwards.

SORTA’s ESMS document provides an example of procedural items to address when conducting an internal assessment.

4.0 Process

4.1 The ESMS designated auditor receives internal ESMS auditor training. The auditors will carry out audits and report the results to the Core Team and management personnel responsible for the area being audited.

4.2 The intention or notification to perform an internal ESMS audit is coordinated and communicated by the ESMS Core Team to the affected departments.

4.3 Based on environmental importance, an audit of the ESMS will be conducted annually. Areas of concern from previous audits (e.g. major nonconformance findings) will be documented and routinely audited.

4.4 Prior to the initiation of the internal ESMS audit, the auditor will conduct a brief opening meeting with individuals from the affected areas.

4.5 The ESMS auditor is provided a checklist, EP 9.2-1FB Internal ESMS Auditing Checklist, which will assist in the basis of the audit. These checklists will be relevant to the department areas. The auditor may review and amend the audit questions and use other types of appropriate auditing documentation.

4.6 During the internal ESMS audit, the auditor will record audit observations on the checklists and other designated working papers only. These documents will be returned at the end of the audit and become records of the audit observations.

4.7 Nonconformance findings requiring corrective action are documented on EP 10.1-1FA Corrective Action Request (CAR) forms. The CARs will be compiled into a list and documented on EP 10.1-1FB Corrective Action Log / Report form. These forms follow the EP 10.1-1 Nonconformity and Corrective Action procedure.

4.8 The ESMS auditor will evaluate CARs for completion and effectiveness.

4.9 All observations and recommendations for improvement are documented on checklists, CARs and/or other appropriate documentation.

4.10 The ESMS auditor will present the relevant CARs to the department manager responsible for the area of the nonconformance. A copy of the documents will be kept and forwarded to the ESMS Core Team with the checklists and other appropriate documentation at the end of the audit.

4.11 All nonconformance items documented by the ESMS auditor during the internal audit are to receive timely and thorough corrective and preventive actions, as appropriate by the management of the area responsible, per the EP 10.1-1 Nonconformity and Corrective Action procedure.

4.12 Upon the close of the audit, the auditor will conduct a closing meeting to present a summary of the internal ESMS audit findings to the relevant personnel.

4.13 Results of the internal ESMS audits are formally communicated to Senior Management on an annual basis during the Management Review Meeting as per the EP 9.3-1 Management Review procedure.

Source: FTA/VT ESMS Institute Homework, SORTA, 2017
Contact: T J Thorn, OHST, TSSP, Vice President, Safety and Security/Chief Safety Officer
1401 Bank Street, Cincinnati, OH 45214-1737
Phone: 513-632-7651
Email: tjthorn@go-metro.com
3.3.4 ESMS Review by Management — MTA

Evaluation of performance of your ESMS includes a very important step, and that is — review by management. Review by top management is critical to the success of the ESMS by assuring that top management is knowledgeable of the impacts of the program and the progress the organization is making. It demonstrates top management’s commitment to the ESMS and allows them to direct needed changes in resources to improve their organization’s performance. To properly assess the status of the ESMS by top management, a detailed agenda ensures that all needed components of review are identified, addressed and documented through a written record. Activities that are implemented as a result of this review are further indications to the staff that top management is involved and committed.

One area of particular concern is that the ESMS review by management process meets the requirements of your ESMS. Frequently organizations miss reportable items and senior management’s documented decisions. A well-designed agenda will ensure that all items are addressed. MTA has provided an example of an ESMS Review by Management Meeting Agenda. This example contains ISO 14001:2015 terminology.
ESMS Management Review Meeting

Date: December XX, 2016

Time: 

Location: 

I. Opening Remarks

II. ESMS Overall Description

III. What are:
   a. External and internal issues that are relevant to the ESMS
   b. Compliance obligations
   c. Significant environmental aspects and risks and opportunities

IV. Information on MTA’s environmental performance, including trends in:
   a. Extent to which the objectives and targets have been met
   b. Nonconformities and corrective actions
   c. Monitoring and measurement results
   d. Conformity to our obligations
   e. Audit Results

V. Recommendations for improvement (Actions, if need when objectives have not been) met

VI. The adequacy of resources required for maintaining an effective ESMS

VII. Communications from external interested parties, including complaints

VIII. Decisions related to continual improvement opportunities

IX. Conclusions on the continuing suitability, adequacy and effectiveness of the ESMS

X. Opportunities to improve integration of the ESMS with other business processes

XI. Any implications for the strategic direction of the organization

XII. Next Steps

Source: FTA/VT ESMS Institute Homework, MTA, 2016
Contact: Robert Frazier, Environmental Manager
1515 Washington Boulevard, Baltimore, MD 21230
Phone: 410-454-7317
Email: rfrrazier@mta.maryland.gov
3.3.5 Nonconforming Practices and Remedial Action — MTA

The nonconforming practices and remedial action process are essential for ensuring that your ESMS remains on track and is consistent with your ESMS goals and targets. MTA provides an excellent example of a Corrective Action request form that defines all of the steps needed to address identified problems within your ESMS.

Please note that the process includes a root cause assessment step to find the true cause of the defect, not just a symptom. Also, Section F. requires a verification step to ensure that the remedial action taken is effective. MTA’s example contains ISO 14001:2015 terminology.

Maryland Transit Administration
Cromwell Light Rail Station facility

ESMS – Nonconformity and Corrective Action
EP-10-10.2-1FB Corrective Action Request (CAR)

DEPARTMENT: _______________________________ CAR REPORT #: _______________________________

(Section A. - B. to be completed by Originator)

A. Audit Area Location: _______________________________

B. Description of Issue: _______________________________

   Nonconformance: □  Opportunity for Improvement: □

ISO Clause Reference: _______________________________

   Issued to Area Rep.: _______________________________

   Originator: _______________________________

   Date: _______________________________

(Section C. - E. to be completed by EMS Team or Area Representative)

C. Root Cause:

   Identify and list Root Cause(s) using the Root Cause matrix (EP-10-10.2-1A Nonconformity Procedure Attachment)

   Describe the contributing causes: _______________________________

D. Short Term Corrective Action: (Containment)

   Target Date: _______________________________

   Project Manager: _______________________________

E. Long Term Corrective Action:

   Ensure compliance obligations for this clause are reviewed and updated annually.

   Target Date: _______________________________

   Project Manager: _______________________________
ESMS – Nonconformity and Corrective Action

EP-10-10.2-1FB Corrective Action Request (CAR)

(Section F. to be completed and signed by the EMS Management Representative and the core EMS Team)

<table>
<thead>
<tr>
<th>F. Verification:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date of Completion:</strong></td>
</tr>
<tr>
<td><strong>EMS Team Member:</strong></td>
</tr>
<tr>
<td><strong>Signature:</strong></td>
</tr>
<tr>
<td><strong>Date:</strong></td>
</tr>
</tbody>
</table>

Source: FTA/VT ESMS Institute Homework, MTA, 2016
Contact: Robert Frazier, Environmental Manager
1515 Washington Boulevard, Baltimore, MD 21230
Phone: 410-454-7317
Email: rfrrazier@mta.maryland.gov
3.3.6 Enhancement of the ESMS — SEPTA

A key activity for maintaining your ESMS is the requirement for constant enhancement of your ESMS and thus your program to enhance your efforts to protect the environment and improve efficiency. SEPTA has demonstrated this commitment through its efforts to enhance by implementing its second-generation Sustainability Program, SEP-TAINABLE 2020, and integrates multiple programs including recycling, renewable energy, stormwater management, and an expansion of their ISO-Certified ESMS — see details below.

The proposed second-generation Sustainability Program, SEP-TAINABLE 2020, aims to build on these successes, and adopts aggressive performance targets. Plans include:

- **A Recycling Program** refresh, in which SEPTA has begun to strategically install recycling receptacles at employee facilities and passenger stations to increase waste diversion rates and reduce costs associated with a multi-year hauling contract.

- **A Renewable Energy Plan**, building off an existing solar proposal to explore budget-neutral opportunities for adoption of renewable energy to reduce greenhouse gas (GHG) emissions.

- **A Stormwater Management Plan**, which would seek cost-effective opportunities to reduce fees associated with impervious surfaces through a partnership with the Philadelphia Water Department and strategic implementation of green infrastructure.

- **An expanded ISO-Certified ESMS** program to include the Wayne Shop as well as implementation of an "ISO Lite" program to introduce environmental management best practices at all SEPTA facilities.

As with the first-generation plan, the SEP-TAINABLE 2020 program plan has been developed through extensive input, including stakeholder roundtables, a public open house, peer agency benchmarking through APTA, and collaboration with key regional planning partners from the Delaware Valley Regional Planning Commission, City of Philadelphia and Bucks, Chester, Delaware, and Montgomery Counties.


NOVEMBER 12, 2020

Contact: Erik Johanson, Sustainability Program Director, SEPTA
1234 Market Street, 4th Floor, Philadelphia, PA 19107
Phone: 215-580-8113
Email: ejohanson@septa.org

4. Closing — Living Document

This ESMS Best Management Practices Guidebook is a living document and will be updated periodically to reflect new transit organization or industry best management practices. Please check our website periodically at [https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/environmental-programs](https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/environmental-programs)