Introduction to a Chesapeake Bay-Focused Environmental Management System (EMS)

Version 2.0

U.S. Environmental Protection Agency (USEPA) Region 3

Introduction to a Chesapeake Bay-Focused Environmental Management System

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Introduction to a Chesapeake Bay-Focused Environmental Management System

Formal environmental management systems (EMS) emerged in the early 1990s, offering organizations a systematic approach to identification and management of the potential environmental consequences of their operations. EMS provides an effective framework for identifying and managing environmental responsibilities, including those of greatest concern to the local community. Implementing an EMS requires active participation of senior leadership in a variety of strategies to integrate environmental and key mission activities and continuously improve environmental performance.

In April 2000, President Clinton signed Executive Order 13148, establishing EMS implementation requirements for all federal facilities. President Bush and the current administration have supported this position. The U.S. Environmental Protection Agency (EPA), as the principal steward for the environment, has taken a leadership position by providing training and encouragement to assist organizations in implementing effective EMSs.

What is the Chesapeake Bay Program?

Chesapeake Bay is our country's largest and most productive estuary, stretching more than 200 miles from Havre de Grace, MD to Norfolk, VA. Its 64,000 square mile watershed is fed by 48 major rivers, 100 smaller rivers, and thousands of tiny streams and creeks. The watershed covers all or parts of six states: Maryland, Virginia, Pennsylvania, New York, Delaware, West Virginia and the District of Columbia. The Chesapeake Bay watershed is an intricate system of terrestrial and aquatic habitats. The open water, underwater grasses, marshes, wetlands, streams and forests provide food and shelter for 3,600 species of plants and animals and more than 15 million people, with another 2.8 million expected by the year 2020.

Healthy water contains a balanced amount of nutrients, as well as sufficient oxygen and sunlight to support living creatures. As development pressures increase, however, the watershed receives an overabundance of the nutrients, nitrogen and phosphorus. Local rivers and streams now transport large quantities of sediment and pollution downstream into Chesapeake Bay, reducing native underwater grasses, reef acreage and the population of oysters. In addition, the watershed is losing thousands of acres of wetlands and forest coverage.

The Chesapeake Bay Program (CBP) is a unique regional partnership whose mission is the protection and restoration of the Chesapeake Bay ecosystem for future generations. The Chesapeake Bay Program partners include the states of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia; the Chesapeake Bay Commission, a tri-state legislative body; the Environmental Protection Agency, representing the federal government; and participating citizen advisory groups.

In June 2000, the Bay Program partners adopted *Chesapeake 2000*, an agreement to guide restoration activities throughout the Bay watershed through 2010. These agreements state specific goals for Bay restoration and provide environmental performance commitments that can be targeted through an organization's EMS.

Training Objectives

Consumers, governments and industry all are seeking ways to reduce the environmental impacts of their activities to ensure their long-term sustainability. The primary objective of this training course is to encourage development and implementation of an EMS that incorporates local environmental priorities. In particular, this course outlines an EMS that focuses on protection of the Chesapeake Bay.

Specifically, this training course will:

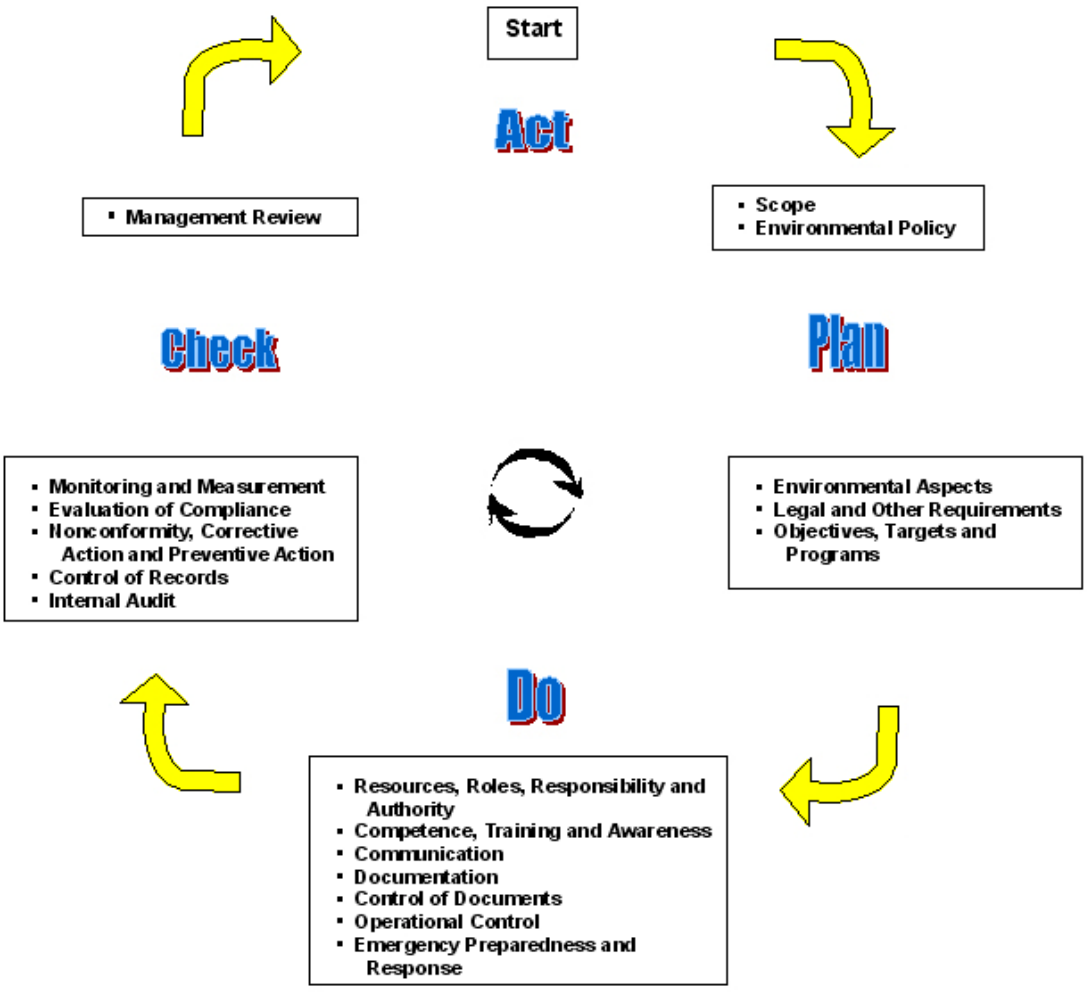
- Provide an overview of the elements of an EMS according to ISO 14001:2004, the international consensus standard for EMS;
- Describe possible approaches to developing an EMS that reflects watershed priorities; and
- Present tools and techniques EMS implementers may use to develop and communicate EMS concepts and affect change within an organization.

The course is organized around the elements of the International Organization for Standardization's (ISO) EMS Standard, ISO 14001:2004. For an overview of the mission and procedures of the International Organization for Standardization and information on how to purchase ISO standards, go to www.iso.org.

Elements of an EMS (ISO 14001:2004)

An EMS is a set of interrelated elements used to establish and implement an organization's environmental policy and manage those activities, products and/or services that interact with the environment. ISO 14001:2004 specifies requirements for implementing these elements to comprehensively manage environmental responsibilities and deliver on the commitments made by top management in an environmental policy statement. The expectation is that the elements are repeated as an iterative process that will lead to continual improvement of environmental management and environmental performance across the organization.

Figure 1 - ISO 14001 Continual Improvement Cycle



The pages that follow present more detail on the specific requirements of each of the EMS elements, as well as possible approaches to customizing these elements to focus on Chesapeake Bay restoration and sustainment goals.

1. **Scope of the EMS**

Requirements:

Define and document the scope of the environmental management system.

Implementation:

Defining the scope of the EMS allows your organization to evaluate which facilities, activities and services will participate in the EMS. Will the EMS be fence-line to fence-line or will you implement incrementally? Which tenants, contractors and/or other service provider activities will be included within the scope of the EMS?

Once you have determined the scope of your EMS, brief senior leadership to ensure that they concur. Document the approved EMS scope in a hard copy or electronic document. Ensure that the scope of the EMS is reviewed by senior leadership during the annual Management Review.

Chesapeake Bay Focus:

- Ensure that the scope of the EMS includes all activities, products and services that have the potential to contribute pollutants to the Chesapeake Bay watershed and/or diminish the quality of habitat for the living resources of the Bay (e.g., wetlands alternations). Include all sources of air emissions, wastewater discharges, including stormwater, and use of pesticides and the Chesapeake Bay Chemicals of Concern (see Appendix 5).

2. Environmental Policy

Requirements:

Ensure that top management (an individual or a group of individuals with executive responsibility for the organization) defines the environmental policy for your organization. The policy must be appropriate to the environmental impacts of your activities, products or services and provide a framework for setting and reviewing environmental objectives and targets. The policy must include commitments to:

- continual improvement,
- prevention of pollution, and
- compliance with applicable environmental legal and other requirements.

The policy must be communicated to all persons working for or on behalf of the organization and must be available to the public.

The policy must be documented, implemented, and maintained.

Implementation:

The environmental policy is the focal point for EMS implementation. It demonstrates your organization's top-level commitment to environmental excellence. The policy becomes a contract between top management and the entire organization. The EMS implementation team is responsible for designing a system that fulfills the commitments stated in the policy.

Work with senior leadership to develop an environmental policy statement that is appropriate to the mission and the environmental footprint of your organization. Review the environmental policy statement carefully to ensure that it includes all of the ISO 14001-required content, prior to issue. Document the environmental policy in either hard copy or electronic format and issue it through your organization's appropriate channels.

Communicate the environmental policy to staff, contractors, service providers, suppliers and any others working on your behalf. Potential tools for communication include staff meetings, annual training, new employee orientation, posting the environmental policy on your internal website and on bulletin boards in shops, offices and break rooms, and any other mechanisms that your organization uses to communicate new environmental policies and procedures.

Work with your Public Affairs Office to ensure that the environmental policy is available to the public. The policy may be posted on an external, public website, if top management concurs.

Ensure that the environmental policy statement is reviewed by senior leadership during the annual Management Review. Revisions to the policy must be communicated to all appropriate personnel and made available to the public.

Chesapeake Bay Focus:

- Establish Bay restoration goals as "other requirements to which the organization subscribes" by including language in the environmental policy statement that links your EMS to the executive-level goals of the Chesapeake Bay Program, e.g., *Chesapeake 2000* and/or *Toxics 2000* (See Appendix 1 and Appendix 2).

- Include a specific commitment to Chesapeake Bay restoration and sustainability.

- Commit to pollution prevention activities focused on Chesapeake Bay Chemicals of Concern (See Appendix 5).

Example:

See Appendix 4 for an example of an Environmental Policy Statement with a Chesapeake Bay focus.

3. Environmental Aspects

Requirements:

Establish a procedure to identify the environmental aspects of the activities, products and services that you control or have influence over, within the defined scope of your EMS. Take into account new developments and new or modified activities, products and services.

Determine those aspects that have or can have significant impacts on the environment and establish your EMS around these significant aspects.

Document and maintain this information.

Implementation:

Environmental aspects form the "backbone" of the EMS. The significant aspects identified by your organization shape the scope and focus of the EMS. It is the significant aspects for which ISO 14001 requires the development of improvement goals (i.e., objectives and targets) and management programs. Each organization sets its own criteria for determining which environmental aspects are significant. This requires an assessment of the scale of environmental impacts among all of the organization's environmental aspects. Those aspects with the largest impacts should become the significant aspects.

Identify all of your target activities, products and services. Establish a procedure for determining the environmental aspects and impacts associated with each, and then use the procedure to develop a list of environmental aspects and impacts associated with the operations of your organization. A sample aspects and impacts analysis might look like the following:

Activity	Environmental Aspects	Environmental Impacts
Laboratory	Hazardous waste Solid waste Air emissions Waste water discharge	Degradation of land Air quality degradation Surface water degradation
Grounds Maintenance	Stormwater Air emissions/exhaust Solid waste	Surface water degradation Air quality degradation Degradation of land
Offices	Electricity consumption Solid waste Universal waste	Resource depletion Degradation of land Air quality degradation Surface water degradation

Each organization assesses the risk associated with its environmental impacts using appropriate criteria for determining which environmental aspects are significant. Those aspects whose impacts rank the highest will become your significant aspects. Senior leadership should assist in determining the criteria you will use to determine which aspects are significant. Potential significance criteria might include:

Potential Significance Criteria
Risk to the environment Risk to Chesapeake Bay Regulatory status Mission impact Community concerns

Assign values and apply the criteria to each aspect within the scope of your EMS. Select the top one or two as your organization's initial significant aspects. Present the results of your significance determination to senior leadership and ask for their concurrence.

Chesapeake Bay Focus:

- Establish significance criteria that reflect risks to Chesapeake Bay. Risks might include potential discharge of chemicals of concern, sediment runoff, habitat loss, point source discharges etc.

- Ensure that procedures for reviewing the environmental impacts of new projects are effective. Add criteria that focus pre-project planning on environmental aspects and impacts that most affect the Chesapeake Bay. Minimize impacts by reviewing alternatives early in the planning process.

Examples:

See Appendix 6, the *Worksheet for Determining Significant Aspects*. Many federal organizations have developed Agency-specific guidance on the development and application of criteria to identify significant aspects. You also may wish to consult references such as the Joint Services P2 Technical Library's EMS Library (http://p2library.nfesc.navy.mil/ems/index.html).

4. Legal and Other Requirements

Requirements:

Establish and maintain a procedure to identify and access applicable legal and other requirements and determine how these requirements apply to your organization's environmental aspects. The term "other requirements" refers to any non-regulatory requirements such as voluntary programs, trade association criteria, and/or Executive Orders.

Implementation:

ISO 14001 addresses compliance with legal and other requirements in several ways. First, it requires a commitment to compliance in the environmental policy statement, the document against which the effectiveness of the EMS is tested over time. Second, it requires a procedure for identification of the regulatory and other requirements that are in effect at any given time. The term "other requirements" refers to any non-regulatory requirements such as voluntary programs, trade association criteria, and Executive Orders. Also, legal and other requirements are considered when setting objectives and targets. In addition, your organization's ability to maintain compliance is assessed through the internal audit and reported to senior leadership during the management review. All of these requirements ensure a high level of awareness and action related to compliance with legal and other requirements.

Determine how your organization identifies the environmental regulatory and other requirements that are in effect at any given time. Consider those environmental requirements that may be managed by others, such as green procurement or contracting requirements. Identify the legal or other requirements associated with each environmental aspect. You may want to consider developing a register or list of all applicable requirements. Annual review and updates to the register will allow you to demonstrate that you are maintaining your commitment to compliance with legal and other requirements.

Chesapeake Bay Focus:

- Identify Chesapeake Bay executive-level strategy documents (e.g., *Chesapeake 2000 and Toxics 2000*, see Appendix 1 and Appendix 2) as "other requirements to which the organization subscribes."

- Create a register of legal and other requirements that are specific to each significant aspect. Include Chesapeake Bay Program directives as other requirements.

5. Objectives, Targets and Programs

Requirements:

Establish, implement, maintain and document measurable (where possible) environmental objectives and targets consistent with the environmental policy including the commitments to compliance, prevention of pollution and continual improvement. Consider legal and other requirements, significant environmental aspects, technological options, financial, operational, and business requirements and the views of interested parties in setting the objectives and targets.

Establish, implement and maintain programs to achieve the objectives and targets. These programs should include designated responsibilities, means and time frame for completion.

Implementation:

Objectives and targets are two of the EMS elements that formalize the continual improvement ethic within the EMS. ***Objectives*** are broad, long-term environmental goals and ***targets*** are the incremental steps that will lead to achievement of the objectives. Although it is most common for organizations to determine objectives and targets for each significant environmental aspect, it is also likely that not all objectives and targets can be completed at the same time. The expectation is that, with the concurrence and support of top management, your organization will pursue those objectives and targets that create the greatest environmental performance improvements.

Your organization should establish at least one objective and supporting targets for each significant environmental aspect. Objectives and targets should be endorsed by senior leadership, prior to implementation.

Create formal, documented programs for each objective that describe the work to be completed, who will perform the work, and set dates for reporting progress and for completion of each task. Assign responsibility for each target and each action that will lead to achieving the target. Determine resource needs, including labor hours, and obtain management approval.

Chesapeake Bay Focus:

There are many opportunities to link EMS objectives and targets to the goals stated in the Chesapeake Bay executive-level strategy documents (e.g., *Chesapeake 2000 and Toxics 2000*, See Appendix 1 and Appendix 2) and/or the tributary-specific strategies that are being developed by the states in the Bay watershed. There are a number of quantitative and non-quantitative statements in these documents that provide excellent starting points for discussion of organization-specific objectives and targets.

- Set quantitative targets that contribute to achieving the goals within *Chesapeake 2000* and *Toxics 2000 (*See Appendices 1 and 2).

- Based on your significance rankings, consider objectives and targets for reduction in the purchase, use and disposal of Chesapeake Bay chemicals of concern. Consider other priority areas such as stormwater (e.g., sediment) control, stream buffers, or maintenance of forested areas.

- Contact local watershed groups for input on objectives and targets. Consider local watershed management plans and/or tributary strategy allocations when setting targets. See Appendix 3 for an example of Tributary Strategies.

Example:

Defense Supply Center Richmond (DCSR) has an EMS objective to improve stormwater management. One target they have met is to establish three storm water raingardens, bioretention/biofiltration units that contain 50% sand, 30 to 40% compost, and 10-20% topsoil. The gardens create a very porous soil that promotes infiltration and decreases the load on DSCR's storm water system.. To intercept oil and greases leaking from vehicles, the rain gardens have been placed at the drainage points of a vehicle maintenance facility and various parking lots. Throughout the gardens, DSCR planted a variety of native plants: winterberry, sweet spires, compact sweet spires, blue flag iris, cardinal flower, calycanthus, and Virginia bluebells.

See Appendix 7 for additional examples of Chesapeake Bay focused objectives and targets.

6. Resources, Roles, Responsibility and Authority

Requirements:

Management must make resources, including labor, infrastructure, technology and funding, available to establish, implement, maintain and improve the EMS. Your organization must appoint an EMS Management Representative to ensure that the EMS is effectively implemented and maintained. The Management Representative also should be the primary liaison with senior leadership. In addition, your organization should define, document and communicate environmental roles, responsibilities and authorities to enhance environmental performance.

Implementation:

Establishing and documenting environmental responsibilities raises the level of environmental accountability throughout your organization. The goal is to document current responsibilities for day-to-day environmental control, as well as those responsible at the system level for keeping the EMS in continual improvement mode. Documented responsibilities also allow the organization to identify ongoing training needs to ensure that those who are responsible not only know they are responsible but are competent to address those responsibilities.

Work with senior leadership to appoint an EMS Management Representative who will take responsibility for implementing and maintaining an effective EMS that conforms to ISO 14001:2004 and your organization's EMS guidance. Ensure that the EMS Management Representative has access to and communicates effectively with senior leadership.

Document environmental responsibilities throughout the organization in position descriptions, organization charts, and/or plans and procedures. Responsibilities that must be established are at both the activity level (e.g. who is responsible for ensuring that the grease trap has been inspected and cleared as necessary on a regular basis), and at the system level (e.g., who is responsible for leading the EMS team and planning the annual Management Review). Demonstrate that environmental responsibilities are communicated to all personnel, tenants, contractors and other service providers.

Chesapeake Bay Focus:

- Demonstrate commitment to Bay restoration goals by allocating resources to achieve objectives and targets that have been focused on Bay priorities.

- Designate the individuals responsible for completing targets, communicate these roles and responsibilities and get management buy-in on time frames and level of effort.

- Assign responsibility for interfacing with the Chesapeake Bay Program and communicating the latest knowledge on Bay priorities back to the organization.

Example:

See Appendix 9 for an example of an Environmental Management Program Form which documents EMS responsibilities.

7. Competence, Training and Awareness

Requirements:

Ensure that any person performing a task that has the potential to cause a significant environmental impact is competent on the basis of education, training or experience. Maintain records of the education, training and/or experience. Identify environmental training needs. Provide training or otherwise meet these needs. Maintain training records.

Establish, implement and maintain procedures to communicate to all personnel working for you or on your behalf:

1. the importance of conforming to the environmental policy, environmental procedures and the EMS;
2. the significant environmental aspects and impacts associated with their work;
3. their EMS roles and responsibilities; and
4. the potential consequences of not following specified procedures and the benefits of improved personal performance.

Implementation:

Your organization must ensure that those who are responsible for environmental management activities receive appropriate training and are competent to perform their responsibilities. Training is important at the activity level where, for example, improper use of equipment could lead to environmental harm. Training also is important for general EMS awareness. Only when everyone in the organization is aware of the environmental policy statement commitments and the EMS objectives and targets will they be able to effectively support continual improvement in the environmental performance of the management system.

Determine whether those individuals responsible for activities associated with any significant aspect have appropriate environmental education, training or experience. Ensure that you have access to records confirming that these individuals are competent.

Identify all of your organization's environmental training needs, including those that may be managed outside of the environmental program, such as government purchase card training. Determine how you will ensure that all initial and refresher training is provided.

Determine how you will document all environmental training and maintain training records.

Establish awareness training procedures to communicate the required environmental and EMS information to all personnel including tenants, contractors and other service providers.

Chesapeake Bay Focus:

- Establish or modify new employee orientation to include an EMS overview and explicit mention of the commitment to Chesapeake Bay protection.
- Schedule annual EMS awareness training that includes examples of potential Bay impacts from your organization's activities.
- Incorporate examples of actual or potential Chesapeake Bay impacts into all environmental training.
- Pay close attention to activity-level training wherever deviation from procedures could lead to a direct and uncontrolled release within the watershed.

Example:

See Appendix 9 for an example of an Environmental Management Program Form, which documents the details of competence and training for a single aspect.

8. Communication

Requirements:

Establish, implement and maintain procedures for internal communication within the organization and for external communication, including receiving, documenting, and responding to external interested parties.

Decide whether to communicate externally about the significant environmental aspects and document the decision. If your organization wishes to communicate its significant aspects, develop a procedure to accomplish this.

Implementation:

Consider how information relevant to the EMS will be disseminated throughout your organization, at a specific activity level, system wide and externally. If a set point on a piece of equipment requires a change because a new operational procedure has been established, how will the operators of the equipment be informed?

If a neighbor of your facility has a concern about an environmental attribute of the facility operations, how will that information be communicated to the EMS Team and top management so they can consider how to address the concern?

This requirement also requires each organization to consider the extent to which you will communicate actions you are taking relative to your significant environmental aspects. The goal should be to communicate as much as possible about your environmental performance without revealing mission-critical or other sensitive information.

Establish an internal communication procedure that includes all those tools used to disseminate information relevant to environmental management throughout your organization. These may include staff meetings, briefings to senior leadership, issuance of policies and procedures, an internal newsletter etc. Address communication up and down the management chain, as well as horizontally throughout your organization.

Develop a process to ensure external stakeholder (i.e. community member or neighbor) concerns are communicated to the EMS Team and top management so they can consider how to address them. You may want to work with your Public Affairs staff to define their procedures for external communication specific to environmental concerns.

Ensure that senior leadership decides whether your significant environmental aspects will be communicated to the public. Document this decision in hard copy or electronic format. If external communication is approved, Public Affairs can assist you in determining the appropriate mechanism such as posting the significant aspects on an external website or issuing a press release.

Chesapeake Bay Focus:

- Ensure that external communication is targeted to interested parties associated with Chesapeake Bay, such as local watershed groups or Businesses for the Bay.
- Highlight environmental performance improvements that contribute to Bay priorities in press releases, annual environmental reports and public web sites.
- Pay close attention to establishing effective activity-level environmental and EMS communication procedures to ensure that information that could potentially impact the Bay is provided to appropriate personnel.

9. Documentation

Requirements:

Document the following elements of the EMS:

- Environmental Policy,
- Objectives and targets,
- Description of the scope of the EMS,
- Description of the main elements of the EMS and their interaction, referring to related documents,
- Documents and records required by ISO 14001:2004, and
- Documents and records essential to the "planning, operation and control" of those activities related to the significant environmental aspects.

Implementation:

ISO 14001 mandates documentation of key elements of the EMS to minimize possible negative impacts associated with deviation from procedures. Many organizations have created an EMS Manual to describe the core elements of the system and how they interact. This manual also points to other important EMS documents; for example, there may be safety documents such as a Spill Prevention Control and Countermeasure (SPCC) or Chemical Hygiene Plan that contain important directives related to environmental performance (e.g., safe handling and spill cleanup procedures). The EMS Manual describes all of these documents that contain environmental information.

Establish EMS documentation, either paper or electronic, that includes all of the required content. Many organizations choose to create a web-based or hard copy EMS Manual that includes descriptions of the organization-specific approach to each core element of the EMS. The manual references other important EMS documents such as system-level procedures, activity-level procedures, and records. Include any additional documents and records specific to those processes associated with your organization's significant aspects.

Chesapeake Bay Focus:

Not Applicable.

Example:

See Appendix 9 for an example of an Environmental Management Program Form, which presents a detailed list of records that pertain to a specific aspect.

10. Control of Documents

Requirements:

Establish, implement and maintain a procedure to:

- Approve documents for adequacy before they are issued,
- Review, revise and re-approve documents,
- Identify changes to and current revision status of documents,
- Make sure the appropriate versions of documents are provided at points of use,
- Keep documents legible and identifiable,
- Control documents of external origin, and
- Identify and control obsolete documents.

Implementation:

This requirement ensures that only documents that are currently in effect are available to members of the organization. This avoids the potential environmental harm that could result from implementing guidance that may have been replaced by new procedures.

Develop procedures to ensure that documents are reviewed and reissued, as required or as needed. Ensure that personnel access only the current versions of regulations, policies, procedures and instructions and that obsolete documents retained for historic purposes are clearly identified and controlled. Many organizations maintain the current versions of plans and guides in a web-based format. Printed documents often include a disclaimer stating that the printed version is uncontrolled or that the printed version is valid only for 24 hours.

Chesapeake Bay Focus:

Not Applicable.

11. Operational Control

Requirements:

Identify and plan functions associated with significant environmental aspects to ensure that they are carried out under specified conditions. Establish, implement, maintain and document procedures to control the potential for deviation from compliance, pollution prevention, continual improvement and/or objectives and targets. State the required operating criteria in the procedure. Establish, implement, maintain and communicate procedures for significant environmental aspects of goods and services used by your organization. Communicate applicable procedures and requirements to suppliers, including contractors.

Implementation:

Operational control refers to the tools used by your organization to control and minimize the environmental impacts of a specific activity. They may include written documents, such as policies and standard operating procedures, or equipment that minimizes emissions. Operational controls are critically important to an effective EMS. They are linked to both roles and responsibilities and training because effective oversight of operational controls reduces the potential for uncontrolled releases to the environment.

Develop and implement operational controls for any activity associated with a significant aspect. Review each activity associated with a significant aspect and the controls for that activity to ensure that the controls are adequate. Also evaluate whether the activity is performed in accordance with the controls. Review the adequacy of operational controls for those significant aspects associated with supplier or contractor goods and services. Strengthen oversight of the adequacy and implementation of operational controls. Maintain records that demonstrate careful management of operational controls including equipment maintenance and calibration, as well as operator training.

Chesapeake Bay Focus:

- Document and take credit for the procedures, controls, and other resources that you currently dedicate to controlling environmental impacts that could harm the Bay.
- Continually improve environmental performance by creating new or upgrading existing operational controls. When making investment decisions for environmental controls, weight those that contribute to Chesapeake Bay priorities most favorably.
- Inventory all operational controls and review those associated with the potential release of Chesapeake Bay Chemicals of Concern. Carefully maintain these controls.

Example:

See Appendix 9 for an example of an Environmental Management Program Form, which includes a document control number.

12. Emergency Preparedness and Response

Requirements:

Establish, implement and maintain procedures to identify and respond to potential emergency situations or accidents that could impact the environment to prevent or mitigate those environmental impacts. Periodically review and revise emergency preparedness and response procedures, particularly following an emergency or accident. Periodically test these procedures, where practicable.

Implementation:

Substantial environmental harm can result from unplanned and uncontrolled releases that result from emergencies. This EMS element requires thoughtful planning (and practice where possible) of containment procedures that will be undertaken in the event of an emergency such as a chemical spill or fire. Often, emergency plans and procedures are captured in health and safety documents (e.g. Full Spectrum Threat Response, Occupant Emergency or SPCC Plans), referenced by the EMS Manual. The goal is to protect the employees during an emergency and to contain and minimize harm to the environment.

Review existing emergency preparedness and response procedures for adequacy. Ensure that an after-action report is generated following each accident or emergency that may harm the environment. Identify requirements for routine testing of emergency procedures (e.g., spill response) and ensure that periodic testing is scheduled and carried out.

Chesapeake Bay Focus:

- When designing emergency containment procedures, place special emphasis on pathways that would allow spills and other emergencies to affect local water conditions.

13. Monitoring and Measurement

Requirements:

Establish, implement and maintain procedures to regularly monitor and measure those key characteristics of your operations and activities that may have a significant impact on the environment. Document information on performance, operational controls and objectives and targets.

Ensure that monitoring and measurement equipment is calibrated or verified and maintained. Maintain records of calibration and maintenance.

Implementation:

Your organization should maintain data to confirm that proper procedures are being followed (e.g., operational controls and the calibration of equipment), to indicate trends in overall environmental performance, and to track progress toward achieving your objectives and targets. Monitoring and measuring results are used by the EMS Team and top management to judge whether the system is effective. The data also is used by auditors to determine whether the organization has allocated sufficient resources through its management programs to fulfill its objectives and targets.

Establish or review and update procedures for tracking key environmental performance indicators. Track progress toward achieving EMS objectives and targets. Establish or review and update procedures to ensure that equipment is maintained according to the manufacturer's recommendations. Establish or review and update procedures to ensure that appropriate environmental equipment is calibrated or verified.

Chesapeake Bay Focus:

- Review monitoring and measuring of performance indicators for processes that purchase, use and discharge Chesapeake Bay Chemicals of Concern (See Appendix 5).

- Monitor the implementation and maintenance of EMS procedures and operational controls such as Stormwater Pollution Prevention Plans.

- Include indicators to track progress toward achieving EMS objectives and targets and their impact on activities associated with significant environmental aspects. Include Bay indicators where appropriate.

Example:

See Appendix 9 for an example of an Environmental Management Program Form that documents monitoring and measurement of one significant aspect.

14. Evaluation of Compliance

Requirements:

Establish implement and maintain procedures for periodically evaluating compliance with applicable legal requirements and keep records of the compliance evaluations.

Establish implement and maintain procedures for periodically evaluating compliance with other requirements to which your organization subscribes and keep records of the evaluations.

Implementation:

It is important to assess the status of your organization's commitment to compliance and most federal agencies have an established process for auditing compliance and documenting their findings. Follow your organization's established procedures for assessment of compliance with legal and other requirements. Many federal organizations conduct internal compliance audits annually, supplemented by an external compliance audit every three to five years. Executive Order 13148 suggests that federal facilities participate in an external compliance assessment every three years.

Chesapeake Bay Focus:

- Emphasize assessment of compliance with those legal and other requirements that protect the Chesapeake Bay. Examples include air permits, NDPES permits, Stormwater Pollution Prevention Plans and requirements for proper storage and disposal of chemicals of concern

15. Nonconformity, Corrective Action and Preventive Action

Requirements:

Establish, implement and maintain procedures for addressing actual and potential nonconformities and taking corrective and preventive action. Procedures should include requirements for:

- Identifying and correcting nonconformance and mitigating its impacts,

- Determining the root cause and taking action to avoid recurrence,
- Evaluating the need for preventive action measures and implementing those measures appropriate to the magnitude of the problem and its impacts,
- Documenting the results of corrective and preventive actions,
- Reviewing the effectiveness of corrective and preventive actions, and
- Making any necessary changes to the EMS documentation.

 **Implementation:**

There are two distinctly different requirements in this element: corrective actions for procedural nonconformances that have occurred, and preventive actions for those environmental incidences that could occur. The standard requires analysis of the root causes of nonconformances and prompts us to consider changes to procedures as necessary to prevent recurrence. An effective corrective and preventive action program will allow your organization to learn from identified nonconformances and demonstrate continual improvement through corrective and preventive action.

Follow your organization's procedures for developing, implementing and maintaining a Corrective Action Plan. For each finding of actual or potential nonconformance, perform root cause analysis and identify the appropriate preventive or corrective action. Implement the corrective action and evaluate its effectiveness in preventing recurrence. Document the results of the corrective action.

 **Chesapeake Bay Focus:**

- Place special emphasis on corrective actions for processes that have a high potential to impact the Bay, such as those processes that involve chemicals of concern.

- Establish a reward system for employees who pursue preventive actions that minimize releases that may impact the Bay.

16. Control of Records

 **Requirements:**

Establish and maintain legible, identifiable and traceable records of efforts to meet EMS requirements and results achieved. Establish, implement and maintain a procedure for the identification, storage, protection, retrieval, retention and disposal of records.

 **Implementation:**

Records are auditable evidence that your organization is doing what it said it would do elsewhere in the EMS documentation. Review your organization's record keeping procedures. Determine those EMS activities for which records are required. Ensure

that records of EMS activities are managed in accordance with local procedures and all legal requirements. Confirm that appropriate records of EMS activities are accessible to staff and auditors.

Chesapeake Bay Focus:

- EMS records can be objective evidence of the Bay focus of the EMS. Specific opportunities to reflect the Bay orientation can include awareness training materials, EMS Team minutes, audit results and preventive and corrective actions, monitoring and measuring results, management review minutes, etc.

Example:

See Appendix 9 for an example of an Environmental Management Program Form which documents records for one significant aspect.

17. Internal Audit

Requirements:

Conduct internal audits of the EMS at planned intervals to determine whether the EMS has been properly implemented and maintained and conforms to ISO 14001 and your internal EMS procedures.

Establish, implement and maintain audit procedures that include the audit criteria, scope, frequency and methods as well as the responsibilities for planning, conducting and reporting audit results and disposition of audit records. Selection of auditors and conduct of audits should ensure the objectivity and impartiality of the audit process. The audit program should consider the environmental importance of the activity and the results of previous audits.

Provide information on the results of audits to management.

Implementation:

An internal audit of the EMS by individuals trained to perform EMS audits provides feedback that your organization can use to verify the status of EMS initiatives and the overall well being of the EMS. The observations made by auditors who have not been members of the EMS Team provides an alternative perspective on conformance with ISO 14001 and your internal EMS procedures and nearly always leads to improvements in the system.

Establish an EMS audit protocol that will allow you to evaluate whether your EMS conforms to ISO 14001, meets your organization's EMS requirements, and whether you are following your internal EMS procedures.

Ensure the audit team includes individuals who have been trained to perform EMS audits as well as individuals who are familiar with your organization and your environmental programs. Conduct internal audits annually, or as directed by senior leadership.

Document the audit findings of non-conformance and develop and implement a corrective action plan. Brief senior leadership on the audit results.

Chesapeake Bay Focus:

- Ensure the audit evaluates the status of programs and priorities related to environmental policy commitments specific to the Chesapeake Bay.

18. Management Review

Requirements:

Top management must review the EMS regularly to evaluate its suitability, adequacy and effectiveness and identify opportunities for improvement. The content of the management review should include:

- The results of internal audits and compliance assessments,
- Communication from external interested parties,
- Environmental performance of the organization,
- Status of objectives and targets,
- Status of corrective and preventive actions,
- Follow-up from previous management reviews,
- Changing circumstances, and
- Recommendations for improvement.

Maintain records of each Management Review, including any decisions regarding revisions to the policy, objectives and targets or other elements of the EMS.

Implementation:

Management review is a formal process that engages senior leadership in a critical review of the organization's ability to fulfill the commitments in the policy statement. It ensures that top management will periodically focus exclusively on to the organization's environmental obligations and issues. The management review provides an opportunity to make the leadership aware of the organization's environmental performance trends and the value returned to the organization by the EMS.

Conduct a formal Management Review of the EMS according to the schedule determined by your agency or your senior leadership. Document the management review and manage the record according to your organization's procedure for control of records.

Chesapeake Bay Focus:

- Present the results of monitoring of Chesapeake Bay indicators.
- Present results of any Bay-related pollution prevention activities, including chemicals of concern replaced or reduced, stormwater run-off controls installed, etc.
- Present information and communications from Bay-related organizations.

Appendix 1 – *Chesapeake 2000*

Chesapeake Bay Program
A Watershed Partnership

CHESAPEAKE 2000

PREAMBLE

The Chesapeake Bay is North America's largest and most biologically diverse estuary, home to more than 3,600 species of plants, fish and animals. For more than 300 years, the Bay and its tributaries have sustained the region's economy and defined its traditions and culture. It is a resource of extraordinary productivity, worthy of the highest levels of protection and restoration.

Accordingly, in 1983 and 1987, the states of Virginia, Maryland, Pennsylvania, the District of Columbia, the Chesapeake Bay Commission and the U.S. Environmental Protection Agency, representing the federal government, signed historic agreements that established the Chesapeake Bay Program partnership to protect and restore the Chesapeake Bay's ecosystem.

For almost two decades, we, the signatories to these agreements, have worked together as stewards to ensure the public's right to clean water and a healthy and productive resource. We have sought to protect the health of the public that uses the Bay and consumes its bounty. The initiatives we have pursued have been deliberate and have produced significant results in the health and productivity of the Bay's main stem, the tributaries, and the natural land and water ecosystems that compose the Chesapeake Bay watershed.

While the individual and collective accomplishments of our efforts have been significant, even greater effort will be required to address the enormous challenges that lie ahead. Increased population and development within the watershed have created ever-greater challenges for us in the Bay's restoration. These challenges are further complicated by the dynamic nature of the Bay and the ever-changing global ecosystem with which it interacts.

In order to achieve our existing goals and meet the challenges that lie ahead, we must reaffirm our partnership and recommit to fulfilling the public responsibility we undertook almost two decades ago. We must manage for the future. We must have a vision for our desired destiny and put programs into place that will secure it.

To do this, there can be no greater goal in this recommitment than to engage everyone — individuals, businesses, schools and universities, communities and governments — in our effort. We must encourage all citizens of the Chesapeake Bay watershed to work toward a shared vision — a system with abundant, diverse populations of living resources, fed by healthy streams and rivers, sustaining strong local and regional economies, and our unique quality of life.

In affirming our recommitment through this new *Chesapeake 2000*, we recognize the importance of viewing this document in its entirety with no single part taken in isolation of the others. This Agreement reflects the Bay's complexity in that each action we take, like the elements of the Bay itself, is connected to all the others. This Agreement responds to the problems facing this magnificent ecosystem in a comprehensive, multifaceted way.

BY THIS AGREEMENT, we commit ourselves to nurture and sustain a Chesapeake Bay Watershed Partnership and to achieve the goals set forth in the subsequent sections. Without such a partnership, future challenges will not be met. With it, the restoration and protection of the Chesapeake Bay will be ensured for generations to come.

WE COMMIT TO:

LIVING RESOURCE PROTECTION AND RESTORATION

The health and vitality of the Chesapeake Bay's living resources provide the ultimate indicator of our success in the restoration and protection effort. The Bay's fisheries and the other living resources that sustain them and provide habitat for them are central to the initiatives we undertake in this Agreement.

We recognize the interconnectedness of the Bay's living resources and the importance of protecting the entire natural system. Therefore, we commit to identify the essential elements of habitat and environmental quality necessary to support the living resources of the Bay. In protecting commercially valuable species, we will manage harvest levels with precaution to maintain their health and stability and protect the ecosystem as a whole. We will restore passage for migratory fish and work to ensure that suitable water quality conditions exist in the upstream spawning habitats upon which they depend.

Our actions must be conducted in an integrated and coordinated manner. They must be continually monitored, evaluated and revised to adjust to the dynamic nature and complexities of the Chesapeake Bay and changes in global ecosystems. To advance this ecosystem approach, we will broaden our management perspective from single-system to ecosystem functions and will expand our protection efforts by shifting from single-species to multi-species management. We will also undertake efforts to determine how future conditions and changes in the chemical, physical and biological attributes of the Bay will affect living resources over time.

GOAL

Restore, enhance and protect the finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem.

Oysters

- By 2010, achieve, at a minimum, a tenfold increase in native oysters in the Chesapeake Bay, based upon a 1994 baseline. By 2002, develop and implement a strategy to achieve this increase by using sanctuaries sufficient in size and distribution, aquaculture, continued disease research and disease-resistant management strategies, and other management approaches.

Exotic Species

- In 2000, establish a Chesapeake Bay Program Task Force to:
    1. Work cooperatively with the U.S. Coast Guard, the ports, the shipping industry, environmental interests and others at the national level to help establish and implement a national program designed to substantially reduce and, where possible, eliminate the introduction of non-native species carried in ballast water; and
    2. By 2002, develop and implement an interim voluntary ballast water management program for the waters of the Bay and its tributaries.

- By 2001, identify and rank non-native, invasive aquatic and terrestrial species which are causing or have the potential to cause significant negative impacts to the Bay's aquatic ecosystem. By 2003, develop and implement management plans for those species deemed problematic to the restoration and integrity of the Bay's ecosystem.

Fish Passage and Migratory and Resident Fish

- By June 2002, identify the final initiatives necessary to achieve our existing goal of restoring fish passage for migratory fish to more than 1,357 miles of currently blocked river habitat by 2003 and establish a monitoring program to assess outcomes.
- By 2002, set a new goal with implementation schedules for additional migratory and resident fish passages that addresses the removal of physical blockages. In addition, the goal will address the removal of chemical blockages caused by acid mine drainage. Projects should be selected for maximum habitat and stock benefit.
- By 2002, assess trends in populations for priority migratory fish species. Determine tributary-specific target population sizes based upon projected fish passage, and current and projected habitat available, and provide recommendations to achieve those targets.
- By 2003, revise fish management plans to include strategies to achieve target population sizes of tributary-specific migratory fish.

Multi-species Management

- By 2004, assess the effects of different population levels of filter feeders such as menhaden, oysters and clams on Bay water quality and habitat.
- By 2005, develop ecosystem-based multi-species management plans for targeted species.
- By 2007, revise and implement existing fisheries management plans to incorporate ecological, social and economic considerations, multi-species fisheries management and ecosystem approaches.

Crabs

- By 2001, establish harvest targets for the blue crab fishery and begin implementing complementary state fisheries management strategies Baywide. Manage the blue crab fishery to restore a healthy spawning biomass, size and age structure.

VITAL HABITAT PROTECTION AND RESTORATION

The Chesapeake Bay's natural infrastructure is an intricate system of terrestrial and aquatic habitats, linked to the landscapes and the environmental quality of the watershed. It is composed of the thousands of miles of river and stream habitat that interconnect the land, water, living resources and human communities of the Bay watershed. These vital habitats–including open water, underwater grasses, marshes, wetlands, streams and forests–support living resource abundance by providing key food and habitat for a variety of species. Submerged aquatic vegetation reduces shoreline erosion while forests and wetlands protect water quality by naturally processing the pollutants before they enter the water. Long-term protection of this natural infrastructure is essential.

In managing the Bay ecosystem as a whole, we recognize the need to focus on the individuality of each river, stream and creek, and to secure their protection in concert with the communities and individuals that reside within these small watersheds. We also recognize that we must continue to refine and share information regarding the importance of these vital habitats to the Bay's fish, shellfish and waterfowl. Our efforts to preserve the integrity of this natural infrastructure will protect the Bay's waters and living resources and will ensure the viability of human economies and communities that are dependent upon those resources for sustenance, reverence and posterity.

GOAL

Preserve, protect and restore those habitats and natural areas that are vital to the survival and diversity of the living resources of the Bay and its rivers.

Submerged Aquatic Vegetation

- Recommit to the existing goal of protecting and restoring 114,000 acres of submerged aquatic vegetation (SAV).
- By 2002, revise SAV restoration goals and strategies to reflect historic abundance, measured as acreage and density from the 1930s to the present. The revised goals will include specific levels of water clarity which are to be met in 2010. Strategies to achieve these goals will address water clarity, water quality and bottom disturbance.
- By 2002, implement a strategy to accelerate protection and restoration of SAV beds in areas of critical importance to the Bay's living resources.

Watersheds

- By 2010, work with local governments, community groups and watershed organizations to develop and implement locally supported watershed management plans in two-thirds of the Bay watershed covered by this Agreement. These plans would address the protection, conservation and restoration of stream corridors, riparian forest buffers and wetlands for the purposes of improving habitat and water quality, with collateral benefits for optimizing stream flow and water supply.
- By 2001, each jurisdiction will develop guidelines to ensure the aquatic health of stream corridors. Guidelines should consider optimal surface and groundwater flows.
- By 2002, each jurisdiction will work with local governments and communities that have watershed management plans to select pilot projects that promote stream corridor protection and restoration.
- By 2003, include in the "State of the Bay Report," and make available to the public, local governments and others, information concerning the aquatic health of stream corridors based on adopted regional guidelines.
- By 2004, each jurisdiction, working with local governments, community groups and watershed organizations, will develop stream corridor restoration goals based on local watershed management planning.

Wetlands

- Achieve a no-net loss of existing wetlands acreage and function in the signatories' regulatory programs.
- By 2010, achieve a net resource gain by restoring 25,000 acres of tidal and non-tidal wetlands. To do this, we commit to achieve and maintain an average restoration rate of 2,500 acres per year basin wide by 2005 and beyond. We will evaluate our success in 2005.
- Provide information and assistance to local governments and community groups for the development and implementation of wetlands preservation plans as a component of a locally based integrated watershed management plan. Establish a goal of implementing the wetlands plan component in 25 percent of the land area of each state's Bay watershed by 2010. The plans would preserve key wetlands while addressing surrounding land use so as to preserve wetland functions.
- Evaluate the potential impact of climate change on the Chesapeake Bay watershed, particularly with respect to its wetlands, and consider potential management options.

Forests

- By 2002, ensure that measures are in place to meet our riparian forest buffer restoration goal of 2,010 miles by 2010. By 2003, establish a new goal to expand buffer mileage.
- Conserve existing forests along all streams and shorelines.
- Promote the expansion and connection of contiguous forests through conservation easements, greenways, purchase and other land conservation mechanisms.

WATER QUALITY PROTECTION AND RESTORATION

Improving water quality is the most critical element in the overall protection and restoration of the Chesapeake Bay and its tributaries. In 1987, we committed to achieving a 40 percent reduction in controllable nutrient loads to the Bay. In 1992, we committed to tributary-specific reduction strategies to achieve this reduction and agreed to stay at or below these nutrient loads once attained. We have made measurable reductions in pollution loading despite continuing growth and development. Still, we must do more.

Recent actions taken under the Clean Water Act resulted in listing portions of the Chesapeake Bay and its tidal rivers as "impaired waters." These actions have emphasized the regulatory framework of the Act along with the ongoing cooperative efforts of the Chesapeake Bay Program as the means to address the nutrient enrichment problems within the Bay and its rivers. In response, we have developed, and are implementing, a process for integrating the cooperative and statutory programs of the Chesapeake Bay and its tributaries. We have agreed to the goal of improving water quality in the Bay and its tributaries so that these waters may be removed from the impaired waters list prior to the time when regulatory mechanisms under Section 303(d) of the Clean Water Act would be applied.

We commit to achieve and maintain water quality conditions necessary to support living resources throughout the Chesapeake Bay ecosystem. Where we have failed to achieve established water quality goals, we will take actions necessary to reach and maintain those goals. We will make pollution prevention a central theme in the protection of water quality. And we will take actions that protect freshwater flow regimes for riverine and estuarine habitats. In pursuing the restoration of vital habitats throughout

the watershed, we will continue efforts to improve water clarity in order to meet light requirements necessary to support SAV. We will expand our efforts to reduce sediments and airborne pollution, and ensure that the Bay is free from toxic effects on living resources and human health. We will continue our cooperative intergovernmental approach to achieve and maintain water quality goals through cost-effective and equitable means within the framework of federal and state law. We will evaluate the potential impacts of emerging issues, including, among others, airborne ammonia and nonpoint sources of chemical contaminants. Finally, we will continue to monitor water quality conditions and adjust our strategies accordingly.

GOAL

Achieve and maintain the water quality necessary to support the aquatic living resources of the Bay and its tributaries and to protect human health.

Nutrients and Sediments

- Continue efforts to achieve and maintain the 40 percent nutrient reduction goal agreed to in 1987, as well as the goals being adopted for the tributaries south of the Potomac River.
- By 2010, correct the nutrient- and sediment-related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired waters under the Clean Water Act. In order to achieve this:

    1. By 2001, define the water quality conditions necessary to protect aquatic living resources and then assign load reductions for nitrogen and phosphorus to each major tributary;

    2. Using a process parallel to that established for nutrients, determine the sediment load reductions necessary to achieve the water quality conditions that protect aquatic living resources, and assign load reductions for sediment to each major tributary by 2001;

    3. By 2002, complete a public process to develop and begin implementation of revised Tributary Strategies to achieve and maintain the assigned loading goals;

    4. By 2003, the jurisdictions with tidal waters will use their best efforts to adopt new or revised water quality standards consistent with the defined water quality conditions. Once adopted by the jurisdictions, the Environmental Protection Agency will work expeditiously to review the new or revised standards, which will then be used as the basis for removing the Bay and its tidal rivers from the list of impaired waters; and

    5. By 2003, work with the Susquehanna River Basin Commission and others to adopt and begin implementing strategies that prevent the loss of the sediment retention capabilities of the lower Susquehanna River dams.

Chemical Contaminants

- We commit to fulfilling the 1994 goal of a Chesapeake Bay free of toxics by reducing or eliminating the input of chemical contaminants from all controllable sources to levels that result in no toxic or bioaccumulative impact on the living resources that inhabit the Bay or on human health.
- By Fall of 2000, reevaluate and revise, as necessary, the "Chesapeake Bay Basinwide Toxics Reduction and Prevention Strategy" focusing on:

    1. Complementing state and federal regulatory programs to go beyond traditional point source controls, including nonpoint sources such as groundwater discharge and atmospheric deposition, by using a watershed-based approach; and

    2. Understanding the effects and impacts of chemical contaminants to increase the effectiveness of management actions.

- Through continual improvement of pollution prevention measures and other voluntary means, strive for zero release of chemical contaminants from point sources, including air sources. Particular emphasis shall be placed on achieving, by 2010, elimination of mixing zones for persistent or bioaccumulative toxics.
- Reduce the potential risk of pesticides to the Bay by targeting education, outreach and implementation of Integrated Pest Management and specific Best Management Practices on those lands that have higher potential for contributing pesticide loads to the Bay.

Priority Urban Waters

- Support the restoration of the Anacostia River, Baltimore Harbor, and Elizabeth River and their watersheds as models for urban river restoration in the Bay basin.
- By 2010, the District of Columbia, working with its watershed partners, will reduce pollution loads to the Anacostia River in order to eliminate public health concerns and achieve the living resource, water quality and habitat goals of this and past Agreements.

Air Pollution

- By 2003, assess the effects of airborne nitrogen compounds and chemical contaminants on the Bay ecosystem and help establish reduction goals for these contaminants.

Boat Discharge

- By 2003, establish appropriate areas within the Chesapeake Bay and its tributaries as "no discharge zones" for human waste from boats. By 2010, expand by 50 percent the number and availability of waste pump-out facilities.
- By 2006, reassess our progress in reducing the impact of boat waste on the Bay and its tributaries. This assessment will include evaluating the benefits of further expanding no discharge zones, as well as increasing the number of pump-out facilities.

SOUND LAND USE

In 1987, the signatories agreed that "there is a clear correlation between population growth and associated development and environmental degradation in the Chesapeake Bay system." This Agreement reaffirms that concept and recognizes that more must be done.

An additional three million people are expected to settle in the watershed by 2020. This growth could potentially eclipse the nutrient reduction and habitat protection gains of the past. Therefore it is critical that we consider our approaches to land use in order to ensure progress in protecting the Bay and its local watersheds.

Enhancing, or even maintaining, the quality of the Bay while accommodating growth will frequently involve difficult choices. It will require a renewed commitment to appropriate development standards. The signatories will assert the full measure of their authority to limit and mitigate the potential adverse effects of continued growth; each however, will pursue this objective within the framework of its own historic, existing or future land use practices or processes. Local jurisdictions have been delegated authority over many decisions regarding growth and development which have both direct and indirect effects on the Chesapeake Bay system and its living resources. The role of local governments in the Bay's restoration and protection effort will be given proper recognition and support through state and federal resources. States will also engage in active partnerships with local governments in managing growth and development in ways that support the following goal.

We acknowledge that future development will be sustainable only if we protect our natural and rural resource land, limit impervious surfaces and concentrate new growth in existing population centers or suitable areas served by appropriate infrastructure. We will work to integrate environmental, community and economic goals by promoting more environmentally sensitive forms of development. We will also strive to coordinate land-use, transportation, water and sewer and other infrastructure planning so that funding and policies at all levels of government do not contribute to poorly planned growth and development or degrade local water quality and habitat. We will advance these policies by creating partnerships with local governments to protect our communities and to discharge our duties as trustees in the stewardship of the Chesapeake Bay. Finally, we will report every two years on our progress in achieving our commitments to promote sound land use.

GOAL

Develop, promote and achieve sound land use practices
which protect and restore watershed resources and water quality,
maintain reduced pollutant loadings for the Bay and its tributaries,
and restore and preserve aquatic living resources.

Land Conservation

- By 2001, complete an assessment of the Bay's resource lands including forests and farms, emphasizing their role in the protection of water quality and critical habitats, as well as cultural and economic viability.
- Provide financial assistance or new revenue sources to expand the use of voluntary and market-based mechanisms such as easements, purchase or transfer of development rights and other approaches to protect and preserve natural resource lands.
- Strengthen programs for land acquisition and preservation within each state that are supported by funding and target the most valued lands for protection. Permanently preserve from development 20 percent of the land area in the watershed by 2010.

- Provide technical and financial assistance to local governments to plan for or revise plans, ordinances and subdivision regulations to provide for the conservation and sustainable use of the forest and agricultural lands.
- In cooperation with local governments, develop and maintain in each jurisdiction a strong GIS system to track the preservation of resource lands and support the implementation of sound land use practices.

Development, Redevelopment and Revitalization

- By 2012, reduce the rate of harmful sprawl development of forest and agricultural land in the Chesapeake Bay watershed by 30 percent measured as an average over five years from the baseline of 1992-1997, with measures and progress reported regularly to the Chesapeake Executive Council.
- By 2005, in cooperation with local government, identify and remove state and local impediments to low impact development designs to encourage the use of such approaches and minimize water quality impacts.
- Work with communities and local governments to encourage sound land use planning and practices that address the impacts of growth, development and transportation on the watershed.
- By 2002, review tax policies to identify elements which discourage sustainable development practices or encourage undesirable growth patterns. Promote the modification of such policies and the creation of tax incentives which promote the conservation of resource lands and encourage investments consistent with sound growth management principles.
- The jurisdictions will promote redevelopment and remove barriers to investment in underutilized urban, suburban and rural communities by working with localities and development interests.
- By 2002, develop analytical tools that will allow local governments and communities to conduct watershed-based assessment of the impacts of growth, development and transportation decisions.
- By 2002, compile information and guidelines to assist local governments and communities to promote ecologically-based designs in order to limit impervious cover in undeveloped and moderately developed watersheds and reduce the impact of impervious cover in highly developed watersheds.
- Provide information to the development community and others so they may champion the application of sound land use practices.
- By 2003, work with local governments and communities to develop land-use management and water resource protection approaches that encourage the concentration of new residential development in areas supported by adequate water resources and infrastructure to minimize impacts on water quality.
- By 2004, the jurisdictions will evaluate local implementation of stormwater, erosion control and other locally-implemented water quality protection programs that affect the Bay system and ensure that these programs are being coordinated and applied effectively in order to minimize the impacts of development.
- Working with local governments and others, develop and promote wastewater treatment options, such as nutrient reducing septic systems, which protect public health and minimize impacts to the Bay's resources.
- Strengthen brownfield redevelopment. By 2010, rehabilitate and restore 1,050 brownfield sites to productive use.
- Working with local governments, encourage the development and implementation of emerging urban storm water retrofit practices to improve their water quantity and quality function.

Transportation

- By 2002, the signatory jurisdictions will promote coordination of transportation and land use planning to encourage compact, mixed use development patterns, revitalization in existing communities and transportation strategies that minimize adverse effects on the Bay and its tributaries.
- By 2002, each state will coordinate its transportation policies and programs to reduce the dependence on automobiles by incorporating travel alternatives such as telework, pedestrian, bicycle and transit options, as appropriate, in the design of projects so as to increase the availability of alternative modes of travel as measured by increased use of those alternatives.
- Consider the provisions of the federal transportation statutes for opportunities to purchase easements to preserve resource lands adjacent to rights of way and special efforts for stormwater management on both new and rehabilitation projects.
- Establish policies and incentives which encourage the use of clean vehicle and other transportation technologies that reduce emissions.

Public Access

- By 2010, expand by 30 percent the system of public access points to the Bay, its tributaries and related resource sites in an environmentally sensitive manner by working with state and federal agencies, local governments and stakeholder organizations.
- By 2005, increase the number of designated water trails in the Chesapeake Bay region by 500 miles.
- Enhance interpretation materials that promote stewardship at natural, recreational, historical and cultural public access points within the Chesapeake Bay watershed.
- By 2003, develop partnerships with at least 30 sites to enhance place-based interpretation of Bay-related resources and themes and stimulate volunteer involvement in resource restoration and conservation.

STEWARDSHIP AND COMMUNITY ENGAGEMENT

The Chesapeake Bay is dependent upon the actions of every citizen in the watershed, both today and in the future. We recognize that the cumulative benefit derived from community-based watershed programs is essential for continued progress toward a healthier Chesapeake Bay. Therefore, we commit ourselves to engage our citizens by promoting a broad conservation ethic throughout the fabric of community life, and foster within all citizens a deeper understanding of their roles as trustees of their own local environments. Through their actions, each individual can contribute to the health and well-being of their neighborhood streams, rivers and the land that surrounds them, not only as ecological stewards of the Bay but also as members of watershed-wide communities. By focusing individuals on local resources, we will advance Baywide restoration as well.

We recognize that the future of the Bay also depends on the actions of generations to follow. Therefore, we commit to provide opportunities for cooperative learning and action so that communities can promote local environmental quality for the benefit and enjoyment of residents and visitors. We will assist communities throughout the watershed in improving quality of life, thereby strengthening local

economies and connecting individuals to the Bay through their shared sense of responsibility. We will seek to increase the financial and human resources available to localities to meet the challenges of restoring the Chesapeake Bay.

GOAL

Promote individual stewardship and assist individuals, community-based organizations, businesses, local governments and schools to undertake initiatives to achieve the goals and commitments of this agreement.

Education and Outreach

- Make education and outreach a priority in order to achieve public awareness and personal involvement on behalf of the Bay and local watersheds.
- Provide information to enhance the ability of citizen and community groups to participate in Bay restoration activities on their property and in their local watershed.
- Expand the use of new communications technologies to provide a comprehensive and interactive source of information on the Chesapeake Bay and its watershed for use by public and technical audiences. By 2001, develop and maintain a web-based clearing house of this information specifically for use by educators.
- Beginning with the class of 2005, provide a meaningful Bay or stream outdoor experience for every school student in the watershed before graduation from high school.
- Continue to forge partnerships with the Departments of Education and institutions of higher learning in each jurisdiction to integrate information about the Chesapeake Bay and its watershed into school curricula and university programs.
- Provide students and teachers alike with opportunities to directly participate in local restoration and protection projects, and to support stewardship efforts in schools and on school property.
- By 2002, expand citizen outreach efforts to more specifically include minority populations by, for example, highlighting cultural and historical ties to the Bay, and providing multi-cultural and multilingual educational materials on stewardship activities and Bay information.

Community Engagement

- Jurisdictions will work with local governments to identify small watersheds where community-based actions are essential to meeting Bay restoration goals—in particular wetlands, forested buffers, stream corridors and public access and work with local governments and community organizations to bring an appropriate range of Bay program resources to these communities.
- Enhance funding for locally-based programs that pursue restoration and protection projects that will assist in the achievement of the goals of this and past agreements.
- By 2001, develop and maintain a clearing house for information on local watershed restoration efforts, including financial and technical assistance.
- By 2002, each signatory jurisdiction will offer easily-accessible information suitable for analyzing environmental conditions at a small watershed scale.

- Strengthen the Chesapeake Bay Program's ability to incorporate local governments into the policy decision making process. By 2001, complete a reevaluation of the Local Government Participation Action Plan and make necessary changes in Bay program and jurisdictional functions based upon the reevaluation.
- Improve methods of communication with and among local governments on Bay issues and provide adequate opportunities for discussion of key issues.
- By 2001, identify community watershed organizations and partnerships. Assist in establishing new organizations and partnerships where interest exists. These partners will be important to successful watershed management efforts in distributing information to the public, and engaging the public in the Bay restoration and preservation effort.
- By 2005, identify specific actions to address the challenges of communities where historically poor water quality and environmental conditions have contributed to disproportional health, economic or social impacts.

Government by Example

- By 2002, each signatory will put in place processes to:
    1. Ensure that all properties owned, managed or leased by the signatories are developed, redeveloped and used in a manner consistent with all relevant goals, commitments and guidance of this Agreement.
    2. Ensure that the design and construction of signatory-funded development and redevelopment projects are consistent with all relevant goals, commitments and guidance of this Agreement.
- Expand the use of clean vehicle technologies and fuels on the basis of emission reductions, so that a significantly greater percentage of each signatory government's fleet of vehicles use some form of clean technology.
- By 2001, develop an Executive Council Directive to address stormwater management to control nutrient, sediment and chemical contaminant runoff from state, federal and District owned land.

Partnerships

- Strengthen partnerships with Delaware, New York and West Virginia by promoting communication and by seeking agreements on issues of mutual concern.
- Work with non-signatory Bay states to establish links with community-based organizations throughout the Bay watershed.

BY THIS AGREEMENT, we rededicate ourselves to the restoration and protection of the ecological integrity, productivity and beneficial uses of the Chesapeake Bay system. We reaffirm our commitment to previously-adopted Chesapeake Bay Agreements and their supporting policies. We agree to report annually to the citizens on the state of the Bay and consider any additional actions necessary.

DATE June 28, 2000

FOR THE COMMONWEALTH OF VIRGINIA

FOR THE STATE OF MARYLAND

FOR THE COMMONWEALTH OF PENNSYLVANIA

FOR THE DISTRICT OF COLUMBIA

FOR THE UNITED STATES OF AMERICA

FOR THE CHESAPEAKE BAY COMMISSION

Appendix 2 – *Toxics 2000*

Chesapeake Bay Program
A Watershed Partnership

CHESAPEAKE EXECUTIVE COUNCIL

TOXICS 2000 STRATEGY

A Chesapeake Bay Watershed Strategy for Chemical Contaminant Reduction, Prevention, and Assessment

In October 1994, the Chesapeake Executive Council adopted the *1994 Chesapeake Bay Basinwide Toxics Reduction and Prevention Strategy* in fulfillment of the 1987 Chesapeake Bay Agreement. In June 2000, the Chesapeake Executive Council adopted the Chesapeake 2000 Bay Agreement committing to fulfill the 1994 Toxics Strategy goal of a *"Chesapeake Bay free of toxics by reducing or eliminating the input of chemical contaminants from all controllable sources to levels that result in no toxic or bioaccumulative impact on the living resources that inhabit the Bay or on human health."* To ensure progress towards this goal, the Executive Council further committed to reevaluate and revise the strategy by Fall of 2000.

THE TOXICS STRATEGY REEVALUATION AND REVISION HAS SHOWN THAT:

We have made significant strides in chemical contaminant reduction, prevention, and assessment activities through both regulatory and voluntary programs.

➢ Industries and federal facilities have achieved their basinwide goals of reducing Toxics Release Inventory chemical releases and transfers and over 250 businesses are participating in the voluntary pollution prevention program, *Businesses for the Bay*.

➢ In 1998, farmers practiced integrated pest management (IPM) on over 3.8 million acres (or 79%) of agricultural cropland surveyed in the Chesapeake Bay watershed.

➢ Between 1990 and 1999 nearly 1.3 million pounds of un-used pesticides were collected and properly disposed of through programs offered in 100% of watershed counties in Maryland, Pennsylvania, and Virginia.

➢ Between 1993 and 1999 nearly 700,000 used pesticide containers were collected and recycled through programs offered in 100% of watershed counties in Maryland, Pennsylvania, and Virginia.

➢ We continue to take actions to better understand and manage the chemical contaminant problems in the three *Regions of Concern*.

We have improved our understanding of chemical contaminant sources, loads, and impacts.

➢ The *1999 Toxics Characterization* and other federal and state characterizations report the status of chemical contaminant effects on living resources:

- The three areas designated by the Executive Council as *Regions of Concern*: Anacostia River, Baltimore Harbor, and Elizabeth River still remain. It

may take years for these river systems to show a measurable response to chemical contaminant clean-up efforts.

- Ten tidal river segments have been characterized as *Areas of Emphasis* with significant potential for toxic effects on living resources and over 200 areas throughout the watershed in Maryland, Pennsylvania, Virginia, and the District of Columbia have been defined by the signatories as impaired or threatened due to chemical contamination.
- Eight tidal river segments have been characterized as *Areas with Low Probability for Adverse Effects* where chemical contaminant problems are unlikely.
- Twenty tidal river segments have been identified as *Areas with Insufficient or Inconclusive Data* where the status of toxic impacts on living resources is unknown.
- Fish consumption advisories have been issued by the states in 21 areas in the Bay watershed due to chemical contaminants that have accumulated in fish tissues.

➢ The *1999 Chesapeake Bay Basinwide Toxics Loading and Release Inventory* reports:

- Nonpoint sources, particularly urban stormwater runoff, represent a substantial source of chemical contaminants to the Bay and its tidal rivers.
- Point sources are subject to direct regulatory controls and have met many of the Bay Program voluntary goals, yet data indicate they may still represent a significant source of some contaminants to the Bay and its tidal rivers

We still have work to do to:

➢ Prevent and reduce chemical contaminant inputs and eliminate toxic impacts on living resources that inhabit the Bay and rivers.

➢ Eliminate all chemical contaminant-related fish consumption bans and advisories.

➢ Clean up contaminants in the sediment in the three *Regions of Concern*.

➢ Sustain our progress and ultimately achieve the Toxics Strategy goal, in the face of increasing population and expanded development within the watershed.

We still have more to learn about:

➢ Chemical contaminant loads and impacts from animal agriculture, pesticide use, groundwater, urban stormwater runoff, and point sources.

➢ The sources and controllability of chemical contaminants from household products, human wastes, and residential activities.

➢ The potential for chemical contaminants to cause toxic impacts on aquatic-dependent wildlife in the Chesapeake Bay watershed.

➢ The long term impacts from low levels of chemical contaminants below thresholds associated with adverse effects on the Bay's living resources.

➢ How to deal with contaminants in sediments.

BASED ON THESE FINDINGS, THE TOXICS 2000 STRATEGY WAS DEVELOPED through a year-long process that incorporated broad stakeholder involvement. Through the Clean Water Act, the Clean Air Act and other federal, state, and local regulatory programs, significant strides have been made in controlling chemical contaminants and protecting living resources and human health. Further chemical contaminant reductions from both point and nonpoint sources are expected in the next decade through implementation of the Clean Water Act for those waterbodies defined as impaired by the jurisdictions. This Strategy **commits to voluntary efforts** that build on the successes of the state and federal regulatory programs and go beyond compliance with existing regulatory point and nonpoint source programs to preclude the need for costly regulations and remediation in the future.

A TARGETED APPROACH

Chemical Focus

With the thousands of chemicals that are being released into the watershed each year, we recognize the need to focus our limited resources on reducing or eliminating releases of those chemicals that we know are presenting the biggest risk to Chesapeake Bay living resources or human health, based on our current state of knowledge. Many of these chemicals of concern in the watershed are persistent or bioaccumulative and pose a risk to living resources or human health. They include:

- chemical contaminants identified in the *1999 Toxics Characterization* that are at levels that may cause toxic impacts to living resources,
- chemical contaminants responsible for listing a waterbody as impaired or threatened on the State and District 303(d) lists, and
- chemical contaminants responsible for finfish and shellfish consumption advisories.

Chemicals of concern include both currently-used chemicals and historically-used chemicals. We recognize that some chemicals are no longer in use and may be more difficult to control, but nonetheless remain a concern because they persist in the environment at levels that pose risks to living resources. We may target additional chemicals of concern for reduction and prevention actions as new data become available from our efforts to characterize toxic impacts and learn more about emerging chemicals of concern. Appendix A is a current list of chemicals of concern.

We also recognize that our knowledge of toxic impacts and chemicals that are causing toxic impacts is incomplete. Long term effects from low levels of multiple contaminants in the water and sediment of the Bay and rivers are not fully understood. Therefore, where feasible, we believe it is prudent to encourage reducing or eliminating loads of any chemical contaminant in the watershed through pollution prevention and other voluntary measures. Therefore, several watershed-wide commitments apply to the Toxics Release Inventory chemical list, a list of over 640 chemicals EPA has determined are being used, manufactured, or released in the environment that may pose threats to the environment and human health. These chemical releases are reported annually by many point sources in the watershed.

Geographic Focus

In order to address chemical contaminant-related problems in the watershed effectively and efficiently, we use an integrated, risk-based approach to focus limited resources in areas impacted or at risk due to chemical contaminants. We commit to stepping up our voluntary efforts in **impacted areas** where chemical contaminant problems are known: the *Regions of Concern*, the waterbodies impaired by chemical contaminants on the jurisdictions' 303(d) lists, and areas subject to finfish or shellfish consumption bans and advisories. We also commit to stepping up voluntary efforts in **areas *at risk***: *Areas of Emphasis* where there is significant potential for toxic impacts on living resources, areas adjacent to land use activities that have a higher potential for contributing persistent or bioaccumulative chemicals such as highly urbanized watersheds or watersheds with intensive agricultural practices. Additional impacted areas and areas at risk may be identified as new data become available from our characterization efforts.

WHAT DO WE WANT?

Strategy Goal: Through implementation of this watershed-wide strategy, the Chesapeake Bay Program signatories re-commit to fulfilling the following goal:

> *Our goal is a Chesapeake Bay free of toxics by reducing or eliminating the input of chemical contaminants from all controllable sources to levels that result in no toxic or bioaccumulative impact on the living resources that inhabit the Bay or on human health.*

HOW DO WE GET THERE?

The signatories commit to the following objectives and commitments to reach the overarching Toxics Strategy goal. Actions are focused on (1) restoration, protection and prevention and (2) monitoring, assessment, and research. Some commitments apply watershed-wide to address common issues across the watershed, while others apply to specific impacted areas and areas at risk.

TAKING RESTORATION, PROTECTION AND PREVENTION ACTIONS

Objective: *Through voluntary pollution prevention and restoration, we commit to (1) restore impacted areas and areas at risk due to legacy and present sources of chemical contaminants so that they can support living resources and humans that depend on them and (2) to protect those rivers that are not currently impacted by chemical contaminants to ensure that they remain un-impacted for future generations.*

To accomplish this objective, the signatories commit to:

Restoring Impacted Areas

To restore the *Regions of Concern* and other impacted watersheds we commit to:

- ➢ by 2001, initiate a series of technology exchanges with scientists, managers, and engineers to identify approaches, methods, and technologies for addressing contaminated sediment that are applicable to the Chesapeake Bay *Regions of Concern*.
- ➢ by 2002, based on these technology exchanges, each *Region of Concern* jurisdiction will review, revise, and begin implementing plans to deal with contaminated sediment which identify locations to target for sediment remediation, applicable technologies and approaches for addressing contaminated sediment, and stakeholders to partner with to ensure that the plans are implemented.
- ➢ prevent or reduce current chemical contaminant loads to these regions by taking voluntary actions that go beyond point and nonpoint source regulatory programs.

Restoring and Protecting Areas at Risk

To ensure that pollution prevention, restoration, and assessment actions are taken to benefit areas at risk due to chemical contaminants so that these areas can be characterized as *Areas with Low Probability for Adverse Effects* we commit to:

- ➢ conduct more detailed source assessments and loadings inventories to better define and manage chemical contaminants inputs from all sources, including contaminated sediment.
- ➢ prevent or reduce current chemical contaminant loads to these regions by taking voluntary actions that go beyond point and nonpoint source regulatory programs.

Protecting Un-impacted Areas

To ensure that *Areas with Low Probability for Adverse Effects* remain un-impacted we commit to:

- ➢ regularly monitor these areas to detect early warning signs of increased chemical contaminant loads or ambient levels that may pose a risk to living resources.
- ➢ encourage sound land use and development activities to prevent additional chemical contaminant loads from entering these rivers,
- ➢ prevent or reduce current chemical contaminant loads to these regions by taking voluntary actions that go beyond point and nonpoint source regulatory programs, particularly in areas under growth and development pressures.

Addressing Finfish/Shellfish Consumption Bans and Advisories

To ensure that finfish and shellfish are safe to eat by all Bay watershed residents and visitors Bay Program signatories, in partnership with the departments of health, the environmental community, and relevant federal agencies, commit to:

Develop Contaminant Prevention and Reduction Strategies

- ➢ By 2002 develop and begin implementing strategies

to prevent or reduce chemical contaminants responsible for fish consumption advisories.

➢ By 2002 in areas where the most substantial source of fish consumption advisories are sediments contaminated by legacy pollutants, evaluate the feasibility of various remediation measures to reduce the risks associated with contaminated sediment.

Evaluate Fish Tissue Monitoring and Outreach Programs

➢ By 2002, evaluate finfish and shellfish tissue monitoring programs and consumption estimates to determine whether they are sufficient for developing, updating, and confirming consumption bans and advisories caused by chemical contaminants and recommend any necessary improvements.

➢ By 2002, evaluate the technical and public outreach components of finfish and shellfish tissue monitoring programs and progress reporting and recommend any necessary improvements to ensure that advisory information is accurate, understandable, and easily available to the public.

➢ By 2002 and every two years thereafter, report on progress in terms of the area (or river miles) of finfish and shellfish grounds assessed, area under advisories due to chemical contaminants, and a summary of trends in contaminant levels in finfish and shellfish in areas under advisories, areas at risk, and un-impacted areas.

➢ By 2004, institute the improvements to programs identified above and assess major fishing areas in the Bay watershed, complete risk screenings, identify specific sub-populations at risk where necessary, and issue consumption advisories where appropriate.

ADDRESSING POINT SOURCES

Point source facilities have made significant progress in preventing and reducing their chemical contaminant loads to the Chesapeake Bay watershed. Although point sources are subject to regulatory controls, there are additional voluntary steps that can be taken to further reduce and prevent chemical contaminant loads and improve point source loadings estimates to the Bay and rivers. The following objectives and commitments target point source facilities such as federal facilities, industries, publicly and privately owned treatment works (otherwise known as municipal wastewater treatment plants), stationary air emission sources in the watershed, businesses, commercial establishments, and state and local government facilities. Stormwater runoff is addressed in the nonpoint source section of this Strategy.

Zero Release Objective: *To achieve the following Chesapeake 2000 Bay Agreement commitment "Through continual improvement of pollution prevention measures and other voluntary means, strive for zero release of chemical contaminants from point sources, including air sources. Particular emphasis shall be placed on achieving, by 2010, elimination of mixing zones for persistent or bioaccumulative toxics."*

To accomplish this objective, the signatories commit to:

Mixing Zone Phase Out

➢ Strive to meet water quality standards for persistent or bioaccumulative chemical contaminants at the point of discharge through continual improvement of pollution prevention measures and other voluntary means.

- By 2001, establish a baseline for the facilities not meeting water quality standards at the point of discharge for persistent or bioaccumulative chemical contaminants and by 2003 and 2007 report on their progress in reducing concentrations at the point of discharge in order to eliminate mixing zones.
- An initial emphasis shall be placed on phasing out mixing zones for persistent or bioaccumulative chemical contaminants in the following areas:
  – Regions of Concern,
  – Areas of Emphasis,

– 303(d) listed waters for persistent or bioaccumulative chemical contaminants,
– Areas under finfish or shellfish advisories caused by persistent or bioaccumulative chemical contaminants.

Chemical Release Reductions

Industries have made significant progress in achieving chemical reductions over the past decade. Between 1988 and 1997 they reduced their releases of Toxics Release Inventory chemicals by 67%. Since that time, many more chemicals and industries have been added to the Toxics Release Inventory. Therefore, we are setting new goals with more recent baselines to achieve further reductions from both industries and publicly and privately owned treatment works.

➢ By 2010 reduce by at least 20% the 1998 Toxics Release Inventory chemical releases and off-site transfers for treatment and disposal from 1998 levels by working with publicly and privately owned treatment works and industries (including air sources) throughout the watershed. Particular emphasis shall be placed on reducing chemicals at the source. By 2005, evaluate progress towards this commitment and commit to greater reductions where necessary by 2010.

➢ By 2005, in impacted areas and areas at risk, reduce by 15% chemicals of concern from 1998 levels by working with publicly and privately owned treatment works and industries (including air sources). By 2005, evaluate progress towards this commitment and commit to greater reductions where possible. Within five years of identifying any new impacted areas or areas at risk, achieve a 15% reduction of chemicals of concern in these new areas.

➢ By 2006, reduce by 40% Toxics Release Inventory chemical releases and off-site transfers from 2001 levels from federal facilities (including air sources) throughout the watershed, through innovative pollution prevention, effective facility management, and sound acquisition and procurement practices.

➢ By 2006, in impacted areas and areas at risk, reduce by 50% chemicals of concern from 2001 levels from priority federal facilities. Within six years of identifying any new impacted areas or areas at risk, achieve a 50% reduction of chemicals of concern in these new areas.

Because chemical contaminant loads from publicly and privately owned treatment works come from a diversity of sources (such as industries and households) they face many challenges in meeting these point source commitments. Additionally, since the publicly and privately owned treatment works do not report chemical releases to the Toxics Release Inventory, it will be particularly important to quantify releases so that progress can be tracked and releases of industries discharging to treatment plants are not double counted. To overcome these challenges, the publicly and privately owned treatment works will:

➢ By 2002, in cooperation with the Chesapeake Bay Program, complete an education effort and establish partnerships with local government pretreatment and pollution prevention programs to encourage industries and Bay watershed residents to reduce their chemical contaminant loads to publicly and privately owned treatment works. Relevant information defining specific sources of chemical contaminants found in municipal wastewater will be gathered in order to develop a target audience for outreach efforts.

➢ By 2005, in cooperation with the Chesapeake Bay Program, quantify the historic and current release of chemical contaminants from publicly and privately owned treatment works and dischargers to these treatment plants. Identify and fill data gaps.

➢ By 2005, in cooperation with the Chesapeake Bay Program and the environmental community select target chemical contaminants being released from publicly and privately owned treatment works, develop reduction targets, and implement reduction activities through pretreatment and pollution prevention partnership programs.

Businesses for the Bay

➢ *Businesses for the Bay* participants will prevent at the source or recycle a total of one billion pounds of hazardous substances between 1999 and 2005. Hazardous substances include those materials listed on the Bay Program's chemicals of concern list and EPA's Toxics Release Inventory and Persistent Bioaccumulative Toxics lists; hazardous air pollutants (HAPs); criteria air pollutants; and hazardous wastes.

➢ By 2005, *Businesses for the Bay* will have 1,000 participants throughout the watershed. Of this, 50% will be small businesses with fewer than 100 employees.

➢ By 2005, *Businesses for the Bay* will have a total of 300 individuals volunteer as mentors to provide pollution prevention assistance to those in need throughout the watershed. These mentors will annually conduct 500 interactions with those in need of assistance.

➢ In 2005, the Pollution Prevention Workgroup will establish new *Businesses for the Bay* goals through 2010, as appropriate.

Sustainable Business Development

➢ By 2002, in cooperation with the departments responsible for economic development within each jurisdiction develop strategies to inform and assist new companies in the Bay watershed to strive for zero release of chemical contaminants through pollution prevention and other methods.

Improving Point Source Loadings Estimates

➢ By 2001, in cooperation with Bay watershed point source facilities, develop an approach for addressing uncertainties in point source chemical contaminant loads estimates in the *1999 Chesapeake Bay Basinwide Toxics Loading and Release Inventory*. Specifically, the Chesapeake Bay Program signatories will work in cooperation with the point source community to:

- quantify "typical pollutant concentrations" for specific point source sectors and extrapolate loadings to these sectors throughout the watershed.
- develop a method to account for contaminant concentrations in the "in-take water" (Bay/river water used for a facility process such as cooling) to calculate the net load they are discharging to the Bay.

ADDRESSING NONPOINT SOURCES

This Strategy considers nonpoint sources of chemical contaminants as agricultural and urban/suburban stormwater runoff, atmospheric deposition, and groundwater. Although much remains to be learned about the load of contaminants from these sources, loadings estimates reveal that some nonpoint sources such as urban stormwater runoff can represent a substantial load of chemical contaminants to the Bay watershed. Although nonpoint sources are subject to some regulatory controls, there are additional steps that can be taken to further reduce and prevent chemical contaminant loads and improve loadings estimates to the Bay and rivers from nonpoint sources.

Zero Release Objective: *Through continual improvement of pollution prevention measures and other voluntary means, strive for zero release of chemical contaminants from nonpoint sources.*

To accomplish this objective, the signatories commit to:

Program Coordination and Progress Reporting

Periodic reports of progress will ensure that our efforts remain focused and on track.

➢ By 2000, the Chesapeake Bay Program's Implementation committee will establish a joint workgroup of the Nutrient and Toxics Subcommittees to coordinate urban and suburban stormwater management programs across and within Bay Program jurisdictional boundaries to improve water quality. Particular emphasis shall be placed on making recommendations to federal, state, and local nonpoint source program managers to:

- integrate chemical contaminants, nutrients, and sediment stormwater-related programs to address the nonpoint source and development commitments in the *Chesapeake 2000* Bay Agreement,
- prevent chemical contaminant loads from developing lands and reduce chemical contaminant loads from developed lands,
- develop tools to help local governments achieve these voluntary commitments.

Chemical Contaminant Reductions

In order to achieve the zero release objective, reductions in chemical contaminant loads from developed areas and lands that have a high potential for contributing contaminants must be achieved. Particular emphasis shall be placed on achieving, by 2010, implementation of innovative stormwater management technologies and pollution prevention measures on lands where stormwater loads of chemical contaminants are not currently managed.

➢ Between 2001 and 2005, the Bay Program jurisdictions will work with local governments and other stakeholders to develop and begin implementing projects and programs that demonstrate reductions in nonpoint sources of chemicals of concern from those areas that are impacted or at risk, including federal, state, and District lands. Specifically, implement:

- projects and programs that reduce stormwater chemical contaminant loads through pollution prevention measures, innovative site design, best management practices or other technologies.
- projects and programs that reduce the use of pesticides, promote less toxic alternatives, or employ other voluntary efforts that ultimately reduce pesticide loads to the watershed.

➢ Between 2005 and 2010, evaluate the effectiveness of these demonstration projects and programs in reducing chemical contaminant loads, report resulting nonpoint source loads reductions, and transfer successful pollutant reduction measures to other areas within the watershed.

➢ By 2010, reduce nonpoint sources of chemicals of concern to the *Regions of Concern* by at least 30%, through implementation of pollution prevention means and other voluntary nonpoint source programs and through accounting of reductions achieved through regulatory programs. By 2002 baselines will be developed for each region.

Chemical Contaminant Prevention

Particular emphasis shall be placed on achieving, by 2010, a no net increase of chemical contaminants from developing lands by using a combination of pollution prevention, sound landuse practices, and innovative technological solutions.

➢ By 2005, reduce chemical contaminants at the source by working with the development community to develop construction materials and techniques and landscaping designs that reduce pollution at the source.

➢ By 2005, reduce chemical contaminants at the source by working with land owners to prevent chemical contaminants from being deposited on their lands as a result of lawn care, vehicle maintenance, and other activities.

➢ By 2010, ensure that the appropriate stormwater management technologies are in place to offset any residual chemical contaminant loads from newly developed lands.

Improving Nonpoint Source Loadings Estimates

➢ By 2002 synthesize literature on pesticide use on all lands, loads, and impacts and make recommendations for filling in key data gaps.

➢ By 2003, Bay scientists will synthesize available information on groundwater contributions of chemical contaminants to the Bay and its rivers.

➢ By 2004, complete initial monitoring and assessments to determine the potential for toxic impacts from episodic chemical contaminant loads from agricultural and urban/suburban runoff on living resources.

➢ By 2005, Bay Program signatories will improve estimates and reduce uncertainty of urban stormwater runoff loads, using all available data from the National Pollutant Discharge and Elimination System Phase I and II stormwater programs, Total Maximum Daily Loads development efforts, and demonstration projects and develop methodologies to extrapolate these loads to other watershed areas.

CONDUCTING MONITORING, ASSESSMENTS, AND RESEARCH

While we commit to taking restoration and protection actions now with our current state of knowledge, we also commit to improving our understanding of chemical contaminant impacts in the watershed and knowledge of emerging threats. We also commit to conducting the necessary chemical and biological monitoring, assessments, and research to measure progress towards achieving the Toxics Strategy goal.

Objective: *To improve our understanding of how basinwide chemical contaminant loads and impacts are related and to conduct the necessary monitoring, research, and assessments to measure progress of our management actions.*

To accomplish this objective, the signatories commit to:

Assessing the Status of Toxic Impacts on Living Resources

➢ By 2005, update the *1999 Toxics Characterization* by conducting the necessary biological and chemical monitoring to characterize the status of chemical contaminant effects on living resources in those tidal rivers characterized as *Areas with Insufficient or Inconclusive Data* and in the mainstem Bay. In 2009, update the Toxics Characterization using any data collected since the previous characterization.

- By 2003, identify toxic impacts on benthic communities by analyzing concurrently-collected sediment contaminant concentrations and benthic community data.
- By 2004, acquire relevant chemical contaminant data that is collected by local governments and is of sufficient quality to aid in updating the *1999 Toxics Characterization.*

Estimating Chemical Contaminant Loads from the Watershed

➢ By 2007, refine the *1999 Chesapeake Bay Basinwide Toxics Loading and Release Inventory* including chemical contaminant loads from upstream sources, agricultural runoff, urban/suburban runoff, atmospheric deposition, point sources, and groundwater.

Improving Coordination and Information Sharing

➢ By 2001, in cooperation with Chesapeake Bay scientists, develop and maintain a web-based clearinghouse of on-going chemical contaminant monitoring, research, and assessments to enhance coordination and information sharing.

➢ The Toxics Subcommittee will host regular scientific seminars to learn about innovative and cost-effective methods for monitoring and assessment, data interpretation, and data integration.

Anticipating Emerging Chemical Contaminant Issues

➢ By 2001, review the state of knowledge regarding the potential for animal agriculture to cause toxic impacts on the Bay's living resources and develop recommendations for filling in key data gaps and implementing any necessary management actions.

➢ By 2007, conduct the necessary monitoring and assessments to determine whether aquatic-dependent wildlife is experiencing toxic impacts in the Chesapeake Bay watershed, with particular emphasis in the three *Regions of Concern*.

➢ Hold symposia as needed to explore the relevancy of other regional, national, or worldwide chemical contaminant issues to the Chesapeake Bay watershed (such as emerging chemicals of concern like pharmaceuticals) and develop additional commitments for addressing these issues if necessary.

Reporting Progress

➢ Through 2010, continue to conduct the necessary monitoring and assessments to evaluate progress of eliminating toxic impacts in areas where management actions are underway, better defining chemical contaminant problems in the areas at risk, and ensuring that unimpacted areas are not getting worse.

➢ Report annually progress made towards the strategy goal.

➢ By 2010, reevaluate and revise as necessary, the basinwide toxics strategy.

HOW DO WE SUSTAIN OUR PROGRESS?

In order to achieve the Toxics Strategy goal, we encourage a community-based watershed management approach that tailors restoration, protection, prevention, and assessment actions to the needs of specific small watersheds and to chemicals of concern (both currently and historically used) to make the best use of limited financial and human resources. To guarantee long-term success in eliminating and preventing toxics impacts in these small watersheds, it is essential that people who live, work, and play in the watershed understand chemical contaminant issues and are actively involved in developing a plan for addressing chemical contaminant problems in their watershed and ensuring that progress is made and sustained.

Objectives:
To promote a community-based watershed management approach to protecting and restoring rivers from chemical contaminant-related problems and increase the opportunity for citizens, watershed organizations, and decision makers to learn about chemical contaminants and their impacts on the Bay ecosystem.

To anticipate future changes and activities on the watershed such as population growth, expanded development, and transportation and ensure that the appropriate voluntary pollution prevention measures are in place to sustain progress towards eliminating toxic impacts in the watershed and to ensure that un-impacted areas are protected for future generations.

To accomplish this objective, the signatories commit to:

Community-based Watershed Management

➢ By 2001, develop a chemical contaminant fact sheet for citizens, watershed organizations, and decision makers that provides more detailed information about the issues and terms referred to in this Strategy.

➢ Work with small watershed stakeholders to incorporate into locally-supported watershed management plans actions to eliminate and prevent toxic impacts in 15 tributary watersheds by 2005 and an additional 20 by 2010 where appropriate by:

- providing relevant information and tools to public and private stakeholders, including citizens, community-based organizations, watershed organizations, local governments, decision makers and elected officials so that they can effectively participate in governmental meetings, watershed management planning, and activities to address chemical contaminant issues in their rivers.
- encouraging integrated approaches for reducing and preventing loads of nutrients, sediment, and chemical contaminants from both point and nonpoint sources.
- promoting protection and restoration of vital living resource habitats such as wetlands and riparian forest buffers that play a key role in restoring and protecting environmental quality.

Anticipating Future Changes on the Watershed

➢ Encourage advances in zero release technologies, innovative and cost-effective nonpoint source controls, methods for dealing with contaminants in sediment, and approaches for sound land use planning.

➢ Conduct the necessary assessments to measure early warning signs of impeded progress due to changes in land use on the watershed.

ADOPTION STATEMENT

BY THIS STRATEGY, we rededicate ourselves to the restoration and protection of the Chesapeake Bay watershed. We agree to report regularly on our progress and consider any additional actions necessary.

DATE: December 2000

FOR THE COMMONWEALTH OF VIRGINIA

FOR THE STATE OF MARYLAND

FOR THE COMMONWEALTH OF PENNSYLVANIA

FOR THE DISTRICT OF COLUMBIA

FOR THE UNITED STATES OF AMERICA

FOR THE CHESAPEAKE BAY COMMISSION

Appendix 3 – Tributary Strategy

Tributary Strategy Highlights for Principals' Staff Committee

Watershed Pollutant Reduction Goals

Pollutant	1985 Loads	2003 Loads	Healthy Bay Goal
Nitrogen (million lbs/yr)	337.54	275.12	175
Phosphorus (million lbs/yr)	27.13	19.31	12.8
Sediment (million tons/yr)	5.834	5.004	4.15

Percentage of Total Load or Land Use in Chesapeake Bay Watershed (2003)

Pollutant	Agriculture	Urban/Suburban	Point Source	Septic	Forest
Nitrogen	40	18	23	4	15
Phosphorus	46	28	24	0	2
Sediment	63	18	0	0	20
% Land Cover	22	19	NA	NA	57

Watershed Pollution Reduction Goals

Watershed-wide, the Chesapeake Bay Program has committed to the following reduction goals in the face of population growth:

- Reduce nitrogen loads by 100.1 million pounds per year from 2003 levels.
- Reduce phosphorus loads by 6.5 million pounds per year from 2003 levels.
- Reduce sediment loads by 0.85 million tons per year from 2003 levels.

Population Growth

- Population in the Chesapeake Bay watershed increased 19% between 1985 and 2002 (from 13.5 million people in 1985 to 16 million in 2002).
- Population is expected to increase from 16 million people today to 17 million in 2010 and 18.3 million in 2020.

Land Cover

- 57% of the watershed is forested.
- 22% of the watershed is agriculture.
- 19% of the watershed is urban/suburban.

Loads and Sources

- Agricultural land contributes the majority of nutrients (40% nitrogen, 46% phosphorus) and sediment (63%) to the Chesapeake Bay.
- Point sources contribute 23% of the nitrogen and 24% of the phosphorus load entering the Bay.
- Urban/suburban lands contribute 18% of the nitrogen, 28% of the phosphorus, and 18% of the sediment load entering the Chesapeake Bay.

- These loads estimates include nitrogen from the air that is deposited onto the watershed and washed into the Bay. Watershed-wide, air pollutants comprise anywhere between a quarter to a third of the total nitrogen load entering the Chesapeake Bay each year.

Tributary Strategies: Examples of Urban Goals as of July 18, 2005

Watershed-wide:

- Focus areas in tributary strategies are: infiltration & filtering stormwater BMPs, low impact development practices such as rain gardens, and urban nutrient management to reduce excessive use of fertilizers on urban lands.

Pennsylvania

- Reduce excessive fertilizer use on 83% of urban lands.
- Implement storm water management on 92% of urban lands with a focus on infiltration and filtering practices.
- About 15,000 acres of forest buffers on urban and suburban lands.

Maryland

- Up to 40% of untreated developed land will be stormwater retrofitted.
- 100% of newly developed and redeveloped land will address stormwater management in accordance with MD law.
- 100% of MD residents will reduce excessive fertilizer use.
- 1.375 acres of urban forest buffers.

Virginia

- Reduce excessive fertilizer use on 32% of urban lands.
- Reduce storm water pollutant loads with a focus on infiltration and filtering practices.
- Over 170,000 acres of forest buffers on urban and suburban lands.

West Virginia (Draft #2)

- Reduce excessive fertilizer use on at least 42% of urban lands.
- Manage storm water on 64% of the urban lands.
- 100% compliance with erosion and sediment control programs.
- About 12,000 acres of forest buffers on urban and suburban lands.

District of Columbia

- Eliminate 96% of combined sewer overflows.
- Promote low impact development practices to further reduce storm water loads.

Delaware "Strawman":

Nanticoke & Broad Creek Only

- Reduce storm water pollutant loads by increasing the use of practices that infiltrate storm water.

New York

Under development.

Appendix 4
Environmental Policy Statement, Chesapeake Bay Program Office

Chesapeake Bay Program
A Watershed Partnership

EPA Chesapeake Bay Program Office
NOAA Chesapeake Bay Office

Environmental Policy Statement

April 22, 2004

To achieve the stewardship commitment within the *Chesapeake 2000* Agreement, we will carefully manage the environmental impacts of our activities and the facilities we use.

As businesses located in the bay watershed, we will:

Integrate Chesapeake Bay restoration goals into efforts to continually improve our own environmental performance ;

Set meaningful pollution prevention goals to reduce the environmental impacts associated with our work ;

Maintain full compliance with environmental regulations and, to the extent possible, federal executive orders ;

Share environmental management successes with other organizations in the Chesapeake Bay watershed to enable them more effectively to manage the environmental impacts of their facilities and contribute to the achievement of the goals of the *Chesapeake 2000* Agreement.

Realization of our environmental goals will be achieved through a proactive management system based on international consensus standards. We invite stakeholders within the Chesapeake Bay watershed to comment on our environmental management initiatives by contacting us at www.chesapeakebay.net.

Rebecca Hanmer, USEPA

Diana Esher, USEPA

Michael Burke, USEPA

Richard Batiuk, USEPA

Albert Todd, USDA/USFS

Lowell Bahner, NOAA

Peyton Robertson, NOAA

Carin Bisland, USEPA

Jonathan Doherty, NPS

Jerry Griswold, USDA/NRCS

Appendix 5
Chesapeake Bay Program Chemicals of Concern

Nitrogen

Phosphorous

Mercury

Polychlorinated Biphenyls (PCBs)

Polyaromatic Hydrocarbons

Benzo(a)pyrene
Indeno[1,2,3-cd]pyrene
Benzo(g,h,i)perylene
Benzo(a)anthracene
Pyrene
Dibenzo(a,h)anthracene
Fluoranthene
Phenanthrene
Benzo(k)fluoranthene
Fluorene
Chrysene
Naphthalene
Acenaphthene
Benzo(b)fluoranthene
Acenaphthylene
Anthracene
2-Methylnaphthalene

Organophosphate Pesticides

Chlorpyrifos
Malathion

Organochlorine Pesticides

Toxaphene
Dieldrin
Endosulfan, alpha & beta
Aldrin
Chlordane
DDT
Endrin aldehyde
DDE
Methoxychlor

Other Metals

Lead
Cadmium
Copper
Iron
Antimony
Nickel
Zinc
Chromium
Selenium
Thallium
Beryllium
Arsenic
Silver

Priority Pollutants

1,4-Dichlorobenzene
Dioxins/Furans
2,4-Dimethylphenol
Hexachlorobenzene
Phenol

Cyanide

Appendix 6
Worksheet for Determining Significant Aspects (Including Chesapeake Bay-Focused Significance Criteria)

Significance Criteria							
Aspect	**Activity**	**Impacts**	**Regulatory Status**	**Risk: Likelihood & Magnitude**	**CB Chemicals of Concern**	**Other water quality impacts**	**Total**
Stormwater	Grounds Maintenance	Release of Pollutants: fertilizer and pesticides	0	Likelihood 3 Magnitude 1	3	3 - sediment	10
	Vehicle Maintenance Facility	Release of Pollutants: oils, grease, fuels	3	Likelihood 1 Magnitude 3	3	0	10
	Construction Activities	Release of Sediment	0	Likelihood 3 Magnitude 2	0	3 - sediment	8
Air Emissions	Vehicle Maintenance Facility	Release of Pollutants: VOCs	0	Likelihood 3 Magnitude 2	0	0	5
	Operation of Vehicle Fleet	Release of Pollutants: NOx, Particulates, PAHs	0	Likelihood 3 Magnitude 1	3	0	7
Wastewater	Vehicle Maintenance Facility – Septic	Release of Pollutants: Nitrates	0	Likelihood 3 Magnitude 1	3	0	7
	Main Building - Municipal	Release of Pollutants: Nitrates	1	Likelihood 2 Magnitude 2	3	0	8

Regulatory Status:
3 = regulated with history of non-compliance
1 = regulated, compliant
0 = not regulated

Chemicals of concern:
Other WQ impacts
3 = yes
0 = no

Likelihood:
3 = high
2 = medium
1 = low

Magnitude:
3 = high
2 = medium
1 = low

Appendix 7
Sample Chesapeake Bay Focused EMS Objectives and Targets

Aspect	Objective	Targets	Measure of Completion
Stormwater	Identify and implement lawn maintenance that will reduce the use of chemical fertilizers and pesticides.	Form a workgroup and prepare a draft lawn maintenance plan within four months of workgroup formation. Prepare a lawn maintenance plan that uses integrated pest management and other techniques to reduce the application of pesticides by at least 20%.	Draft workplan delivered to EMS team within four months of workgroup formation
		Implement the final lawn maintenance plan within three months of finalization.	Plan implemented within three months of finalization. EMS documents edited to reflect new procedures
Nutrient loading	By 2010 ensure that fertilizer, soil amendments and compost used on federal lands include a minimum of 20% poultry litter or animal manure nutrients from sources within the Chesapeake Bay watershed	Identify sources of fertilizer, compost and other soil amendments manufactured from poultry litter and/or animal manure from sources in the watershed. Obtain samples for testing and confirm that the product meets performance requirements	Report on performance of fertilizer, compost and/or other soil amendments within 18 months.
		Perform cost benefit analysis and initiate purchase agreements	Annual procurement plans include procurement of fertilizer, compost and/or soil amendments with >20% poultry litter or animal manure nutrients from Chesapeake Bay watershed.
Air Emissions	Reduce air emissions from vehicle fleet usage	Convert the vehicle fleet to at least 50% hybrid vehicles by 2008.	Annual procurement plans include hybrid vehicle procurement.
		Within three months, review vehicle routing procedure to eliminate duplicate routes. Report recommendations to Operations Branch and implement changes that will reduce miles driven.	Vehicle dispatcher provides recommendations within three months. Operations Branch implements recommendations, edits procedures.

Appendix 8
Example Goals from Toxics 2000 and Chesapeake 2000 to Consider When Setting Objectives and Targets

LIVING RESOURCE PROTECTION AND RESTORATION C2K
Goal: *Restore, enhance and protect the finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem.*
Exotic Species
• Identify and rank non-native, invasive aquatic and terrestrial species, which are causing or have the potential to cause significant negative impacts to the Bay's aquatic ecosystem. • Substantially reduce and, where possible, eliminate the introduction of non-native species carried in ballast water. • Implement voluntary ballast water management programs for the waters of the Bay and its tributaries.
VITAL HABITAT PROTECTION AND RESTORATION C2K
Goal: *Preserve, protect and restore those habitats and natural areas that are vital to the survival and diversity of the living resources of the Bay and its rivers.*
Wetlands
• Achieve a no-net loss of existing wetlands acreage and function. • By 2010, achieve a net resource gain by restoring 25,000 acres of tidal and non-tidal wetlands.
Forests
• Meet our riparian forest buffer goal of 2,010 miles by 2010. • Conserve existing forests along all streams and shorelines. • Promote the expansion and connection of contiguous forests through conservation easements, greenways, purchase and other land conservation mechanisms.

WATER QUALITY PROTECTION AND RESTORATION

Goal: *Achieve and maintain water quality necessary to support aquatic living resources of the Bay and its tributaries.*

Nutrients and Sediments C2K

- By 2010, correct the nutrient- and sediment-related problems in the Chesapeake Bay and its tidal tributaries from the list of impaired waters under the Clean Water Act.
- Achieve and maintain the 40% nutrient reduction goal.
- Begin implementation of revised Tributary Strategies to achieve and maintain the assigned loading goals.

Chemical Contamination C2K

- A Chesapeake Bay free of toxics by reducing or eliminating the input of chemical contaminants from all controllable sources to levels that result in no toxic or bioaccumulative impact on the living resources that inhabit the Bay or on human health.

Priority Urban Waters C2K

- Support the restoration of the Anacostia River, Baltimore Harbor, and Elizabeth River and their watersheds as models for urban river restoration in the Bay basin.

Point Sources T2K

Chemical Release Reductions

- By 2010 reduce by at least 20% the 1998 Toxics Release Inventory chemical releases and off-site transfers for treatment and disposal from 1998 levels by working with publicly and privately owned treatment works and industries (including air sources) throughout the watershed. Particular emphasis shall be placed on reducing chemicals at the source.
- By 2006, reduce by 40% Toxics Release Inventory chemical releases and off-site transfers from 2001 levels from federal facilities (including air sources).
- By 2006, in impacted areas and areas at risk, reduce by 50% chemicals of concern from 2001 levels from priority federal facilities.

Businesses for the Bay

- Businesses for the Bay participants will prevent at the source or recycle a total of one billion pounds of hazardous substances between 1999 and 2005. Hazardous substances include those materials listed on the Bay Program's chemicals of concern list and EPA's Toxics Release Inventory and Persistent Bioaccumulative Toxics lists; hazardous air pollutants (HAPs); criteria air pollutants; and hazardous wastes**.**
- By 2005, Businesses for the Bay will have a total of 300 individuals volunteer as mentors to provide pollution prevention assistance to those in need throughout the watershed. These mentors will annually conduct 500 interactions with those in need of assistance.

Sustainable Business Development

- New companies in the Bay watershed strive for zero release of chemical contaminants through pollution prevention and other methods in cooperation with the departments responsible for economic development within each jurisdiction.

Nonpoint Sources T2K
Chemical Contaminant Reductions
• Complementing state and federal regulatory programs to go beyond traditional point source controls, including non-point sources such as groundwater discharge and atmospheric deposition, by using a watershed-based approach • Implement projects and programs that reduce storm water chemical contaminant loads through pollution prevention measures, innovative site design, best management practices or other technologies. • Implement projects and programs that reduce the use of pesticides, promote less toxic alternatives, or employ other voluntary efforts that ultimately reduce pesticide loads to the watershed. • Reduce nonpoint sources of chemicals to the *Regions of Concern* by at least 30%, through the implementation of pollution prevention means and other voluntary nonpoint source programs
Chemical Contaminant Prevention
• Reduce the potential risk of pesticides to the Bay by targeting education, outreach and implementation of Integrated Pest Management and specific Best Management Practices on those lands that have higher potential for contributing pesticide loads to the Bay. • Reduce chemical contaminants at the source by working with landowners to prevent chemical contaminants from being deposited on their lands as a result of lawn care, vehicle maintenance and other activities. • Reduce chemical contaminants at the source by working with the development community to develop construction materials and techniques and landscaping designs that reduce pollution at the source. • Ensure that the appropriate stormwater management technologies are in place to offset any residual chemical contaminant loads from newly developed lands

SOUND LAND USE C2K
Goal: *Develop, promote and achieve sound land use practices which protect and restore watershed resources and water quality, maintain reduced pollution loadings for the Bay and its tributaries, and restore and preserve aquatic living resources.*
Land Conservation
• Expand the use of voluntary and market-based mechanisms such as easements, purchase or transfer of development rights or other approaches to protect and preserve natural resource lands. • Permanently preserve from development 20% of the land area in the watershed by 2010.
Development, Redevelopment, and Revitalization
• Reduce the rate of harmful sprawl development of forest and agricultural land in the Chesapeake Bay watershed by 30 percent measured as an average over five years from the baseline of 1992-1997 • Promote redevelopment and remove barriers to investment in underutilized urban, suburban and rural communities by working with localities and development interests. • Encourage the development and implementation of emerging urban storm water retrofit practices to improve their water quality and quality function.
Transportation
• Promote the coordination of transportation and land use planning to encourage compact, mixed use development patterns, revitalization in existing communities and transportation strategies that minimize adverse effects on the Bay and its tributaries. • Reduce the dependence on automobiles by incorporating travel alternatives such as telework, pedestrian, bicycle, and transit options. • Opportunities to purchase easements to preserve resource lands adjacent to rights of way and special efforts for stormwater management on both new and rehabilitation projects. • Encourage the use of clean vehicle and other transportation technologies that reduce emissions.

STEWARDSHIP AND COMMUNITY ENGAGEMENT C2K
Goal: *Promote individual stewardship and assist individuals, community- based organizations, businesses, local governments, and schools.*
Education and Outreach
• Make education and outreach a priority to achieve public awareness and personal involvement on behalf of the Bay and local watersheds. • Provide information to enhance the ability of citizens and community groups to participate in Bay restoration activities on their property and in their local watershed. • Provide students and teachers alike with opportunities to directly participate in local restoration and protection projects, and to support stewardship efforts in schools and on school property. • Highlight cultural and historical ties to the Bay, and provide multi-cultural and multi-lingual educational materials on stewardship activities and Bay information.
Community Engagement
• Identify small watersheds where community-based actions are essential to meeting Bay restoration goals-in particular wetlands, forests buffers, stream corridors, and public access. • Identify community watershed organizations and partnerships. Assist in establishing new organizations and partnerships where interest exists.
Government by Example
• Expand the use of clean vehicles technologies and fuels on the basis of emission reductions, so that a significantly greater percentage of each signatory government's fleet of vehicles use some form of clean technology. • Address stormwater management to control nutrient, sediment, and chemical contaminant runoff from state, federal and District owned land.

Appendix 9
Environmental Management Program Form

Environmental Management Program Form

Significant Environmental Aspect:	Document Control Code:	ESC EMS-11.00
Waste Generation	Date:	August 29, 2002

1. Objective(s):

a. To maintain compliance with Federal, State and local regulations concerning waste disposal.
b. To maintain, follow and practice the emergency preparedness, spill response and containment procedures as specified in the ESC Chemical Hygiene Plan (CHP), Spill Prevention, Control and Countermeasures Plan (SPCC) and Occupant Emergency Plan (OEP).
c. To perform root cause analysis of waste release (e.g., spills) incidents to find opportunities to prevent future releases within 30 days.
d. To gather and evaluate baseline data on the amount and types of hazardous and non-hazardous wastes generated, recycled and/or disposed of, then develop strategies (if possible or feasible) to reduce the amount of waste generated and/or disposed of, or increase the amount of waste recycled and/or reused.
e. Maintain and promote the awareness and involvement of ESC employees to specific facility/laboratory opportunities that have been identified to reduce the generation of wastes, or increase the amount of wastes recycled and/or reused.

2. Target(s):

a. 100% compliance with all waste disposal regulations.
b. To perform annual updates, quarterly drills with no deviations from the CHP, SPCC, and OEP.
c. Complete root cause analyses of waste releases (e.g., spills) and provide strategies to prevent future releases within 30 days.
d. Determine base amounts for recycled materials, hazardous wastes and non-hazardous wastes generated and disposed of by the facility, within 6 months of initial meeting between EMS Team and EMP Workgroup. Determine whether opportunities exist to reduce facility wastes (both hazardous and non-hazardous wastes) by employing source reduction, substitution, recycling and reuse, then develop strategies (if possible or feasible) to reduce facility/laboratory waste generation, within 6 months of baseline data accumulation.
e. Increase awareness and involvement of ESC staff regarding their impacts related to waste generation through activities such as training courses, holding brown-bag lunches, reports to the ESC Board, e-mail notifications, and posting information.

3. Reason for Significance:

a. Appears on the ESC High Significance Report
b. Legal and other requirements.
c. Existing program.

4. Potential Environmental Impacts:

a. Release of pollutants

Environmental Management Program Form

5. Specific Legal and Other Requirements:

a. OSHA, 29 CFR Part 1910 Occupational and Health Safety Standards

- 1910.120 Hazardous Waste Operations and Emergency Response. Cleanup, corrective actions, voluntary cleanup, TSD facilities, emergency response
- 1910.134 Respiratory Protection Standard. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, must be provided wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered

b. EPA, 40 CFR Part 243, RCRA, Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste

c. EPA, 40 CFR Part 246, RCRA, Source Separation for Materials Recovery Guidelines

- 246.200: High-grade paper generated by office facilities of over 100 office workers must be separated at the source of generation, separately collected, and sold for the purpose of recycling.

d. EPA, 40 CFR Part 260, RCRA, Hazardous Waste Management System: General

- Provides definitions of terms, general standards, and overview information applicable to parts 260 through 265 and 268

e. EPA, 40 CFR Part 261, RCRA, Identification and Listing of Hazardous Waste

- Identifies those solid wastes which are subject to regulation as hazardous wastes under parts 262 through 265, 268, and parts 270, 271, and 124 of this chapter and which are subject to the notification requirements of section 3010 of RCRA

f. EPA, 40 CFR Part 262, RCRA, Standards Applicable to Generators of Hazardous Waste

- 262.10(c) A generator who treats, stores, or disposes of hazardous waste on-site must only comply with the following sections of this part with respect to that waste: Section 262.11 for determining whether or not he has a hazardous waste, §262.12 for obtaining an EPA identification number, §262.34 for accumulation of hazardous waste, §262.40 (c) and (d) for recordkeeping, 262.43 for additional reporting additional reporting.

g. EPA, 40 CFR Part 266, RCRA, Standards for the Management of Specific Hazardous Wastes

and Specific Types of Hazardous Waste Facilities

- " Products produced for the general public s use that are used in a manner that constitutes disposal and that contain recyclable materials are not presently subject to regulation

h. EPA, 40 CFR Part 268, RCRA, Land Disposal Restrictions

- " identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be land disposed

i. EPA, 40 CFR Part 270, RCRA, General Application Permit Requirements

- " basic EPA permitting requirements, such as application requirements, standard permit conditions, and monitoring and reporting requirements

j. EPA, 40 CFR Part 273, RCRA, Standards for Universal Waste Management

- " 273.1(a) Requirements for managing batteries, pesticides, thermostats, and lamps

k. EPA, 40 CFR Part 761, TSCA, Polychlorinated biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

- " Subpart A, General Establishes prohibitions of, and requirements for, the manufacture, processing, distribution in commerce, use, disposal, storage, and marking of PCBs and PCB Items
- " Subpart B, Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
  761.35 Storage for Reuse
- " Subpart C, Marking of PCBs and PCB items
  761.40 Marking Requirements
  761.45 Marking Formats
- " Subpart D, Disposal Requirements
  761.50 Applicability
  761.60 Disposal Requirements
  761.61 PCB Remediation Waste
  761.64 PCB Disposal of wastes generated as a result of research and development activities authorized under 761.30(j) and chemical analysis of PCBs
  761.65 PCB Storage for Disposal
  761.79 PCB Decontamination Standards and Procedures
- " Subpart G, PCB Spill Cleanup Policy
  761.125 Requirements for PCB Spill Cleanup. Reporting, disposal, and

precleanup requirements apply to all spill of PCBs at concentrations 50 ppm or greater which are subject to TSCA decontamination requirements
761.205 Notification of PCB Waste Activity

- " Subpart J, General Records and Reports
- " Subpart K, PCB Waste Disposal Records and Reports

l. 49 CFR 172.101, Purpose and Use of Hazardous Materials Table

- " Hazardous Materials Table designates the materials listed as hazardous materials for transportation. For each listed material, the table identifies the hazard class or specifies that the material is forbidden in transportation, and gives the proper shipping name or directs the user to the preferred proper shipping name. In addition, the Table specifies or references requirements for labeling, packaging, quantity limits aboard aircraft and vessels.

m. COMAR 26.13. Disposal of Controlled Hazardous Substances

- " 26.13.02. Identification and Listing Of Hazardous Waste. Contaminated soils and other solids recovered from spills or removed from old disposal sites containing PCB at concentrations of less than 50 ppm shall be disposed of at approved sites only if they do not otherwise qualify as a hazardous waste under this regulation.

- " 26.13.02. Hazardous waste includes any residue or contaminated soil, water, or other debris resulting from the cleanup of a spill, into or on any land or water, of any commercial chemical product or manufacturing chemical product or manufacturing chemical intermediate or mixtures containing polychlorinated biphenyls (PCBs) at concentrations greater than 50 ppm. The hazardous waste number for these mixtures is MX 01.

- " 26.13.03. Standards Applicable to Generators of Hazardous Waste. Accumulated hazardous wastes are subject to regulation under COMAR 26.13.03-26.13.07 and 26.13.10 and the applicable notification requirements of §3010 of RCRA.

- " 26.13.05.D3. Special Requirements for Hazardous Waste Generated by Small Quantity Generators. In order for hazardous waste to be excluded from regulation under this chapter, the generator may not accumulate on site at any time acute hazardous wastes in quantities greater than 1 kilogram or more than a total of 100 kilograms of any hazardous waste not otherwise regulated under §D(3)(a) of this regulation.

- " 26.13.03.05E. If <500 kg of hazardous waste and <1 kg acute hazardous waste is accumulated on site, then the waste may be accumulated for 180 days.

n. Executive Order 13101, Greening the Government Through Waste Prevention, Recycling, and

Federal Acquisition

- Section 101, 102, 401. Prevent pollution whenever feasible; acquire environmentally preferable products. Consider the following factors in acquisition planning: use of biobased products; use of recovered materials; reuse of product; life cycle cost; recyclability; use of environmentally preferable products; waste prevention (including toxicity reduction or elimination); and ultimate disposal.

- Section 402. Affirmative Procurement Programs. Develop and implement affirmative procurement programs. Agencies shall ensure that their affirmative procurement programs require 100 percent of their purchases of products to meet or exceed the EPA guideline unless written justification is provided that a product is not available competitively within a reasonable time frame, does not meet appropriate performance standards, or is only available at an unreasonable price.

- Section 502(c). Designation of Items That Contain Recovered Materials (CPG). Once items containing recovered materials have been designated by the EPA in the Comprehensive Procurement Guidelines, agencies shall modify their affirmative procurement programs to require that, to the maximum extent practicable, their purchases of products meet or exceed the EPA guidelines.

- Section 505. Minimum Content Standard for Printing and Writing Paper. Agencies shall meet or exceed the following minimum materials content standards when purchasing or causing the purchase of printing and writing paper: (a) For high speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock, the minimum content standard shall be no less than 30 percent postconsumer materials beginning December 31,1998.

- Section 601(a)(2). In addition to white paper, mixed paper/cardboard, aluminum, plastic, and glass, agencies should incorporate into their recycling programs efforts to recycle, reuse, or refurbish pallets and collect toner cartridges for remanufacturing. Agencies should also include programs to reduce or recycle, as appropriate, batteries, scrap metal, and fluorescent lamps and ballasts.

- Section 705. Recycling Programs. Each agency shall initiate a program to promote cost-effective waste prevention and recycling of reusable materials in all of its facilities. Designate a recycling coordinator for each facility.

o. Executive Order 13148, Greening of the Government Through Leadership in Environmental Management.

- Section 204. Release Reduction: Toxic Chemicals. Each agency shall reduce its reported Toxic Release Inventory (TRI) releases and off-site transfers of toxic chemicals for treatment and disposal by 10 percent annually, or by 40 percent overall by December 31, 2006.

- Section 205. Use Reduction: Toxic Chemicals and Hazardous Substances and Other Pollutants. Each agency shall reduce its use of selected toxic chemicals, hazardous substances, and pollutants, or its generation of hazardous and radioactive waste types at its facilities by 50 percent by December 31, 2006.

- Section 304. Pollution Prevention Return-on-Investment Programs. Each agency shall develop and implement a pollution prevention program at its facilities that compares the life cycle costs of treatment and/or disposal of waste and pollutant streams to the life cycle costs of alternatives that eliminate or reduce toxic chemicals or pollutants at the source. Each agency shall implement those projects that are life- cycle cost-effective, or otherwise offer substantial environmental or economic benefits.

- Section 305(b). Policies, Strategies, and Plans. By March 31, 2002, each agency shall ensure that its facilities develop a written plan that sets forth the facility's contribution to the goals and requirements established in this order. The plan should reflect the size and complexity of the facility. Where pollution prevention plans or other formal environmental planning instruments have been prepared for agency facilities, an agency may elect to update those plans to meet the requirements and goals of this section.

- Section 307. Annual Reports. Each agency shall submit an annual progress report to the Administrator on implementation of this order. The reports shall include a description of the progress that the agency has made in complying with all aspects of this order, including, but not limited to, progress in achieving the reduction goals in sections 502, 503, and 505 of this order.

- Section 402. Facility Compliance Audits. Within 12 months of the date of this order, each agency with an established regulatory environmental compliance audit program may elect to conduct EMS audits in lieu of regulatory compliance audits at selected facilities within 6 months of development of EMS program.

- Section 501. Toxics Release Inventory/Pollution Prevention Act Reporting. (a) Each agency shall comply with the provisions set forth in section 313 of EPCRA, section 6607 of Pollution Prevention Act, all implementing regulations, and future amendments to these authorities, in light of applicable EPA guidance.

- Section 502. Release Reduction: Toxic Chemicals. (a) Beginning with reporting for calendar

year 2001 activities, each agency reporting under section 501 of this order shall adopt a goal of reducing, where cost effective, the agency's total releases of toxic chemicals to the environment and off-site transfers of such chemicals for treatment and disposal by at least 10 percent annually, or by 40 percent overall by December 31, 2006.

" Section 503. Use Reduction: Toxic Chemicals, Hazardous Substances, and Other Pollutants. To attain the goals of section 205 of this order: (a) Within 18 months of the date of this order, each agency with facilities shall develop and support goals to reduce the use at such agencies' facilities of the priority chemicals on the list under subsection (b) of this section for identified applications and purposes, or alternative chemicals and pollutants the agency identifies under subsection (c) of this section, by at least 50 percent by December 31, 2006.

6. Performance Indicators:

a. No regulatory findings for waste generation being listed on any internal or external compliance inspection report.
b. Annual review of CHP, SPCC, OEP, training records of employees and inventories of materials and supplies for spill cleanup and containment. Quarterly evacuation drills and biennial mock spill response exercises with Fire Department Haz-Mat teams.
c. All root cause analyses of waste releases (e.g., spills) and provide strategies to prevent future releases completed within 30 days.
d. Final report containing baseline amounts for recycled materials, hazardous wastes and non-hazardous wastes generated and disposed of by the facility, within 6 months of initial meeting between EMS Team and EMP Workgroup.
e. Final report containing opportunities identified to reduce facility hazardous and non-hazardous wastes (by employing source reduction, substitution, recycling and reuse) and potential strategies (if possible or feasible) to reduce facility/laboratory waste generation, within 6 months of baseline data accumulation.
f. Documentation of training sessions, brown bag lunches, etc. being conducted within one year of finalizing the baseline within one year of baseline data accumulation.

7. Program Description:

The Environmental Science Center (ESC) is a consolidated facility housing offices and extensive chemical and microbiological laboratories from several different EPA organizations. The office activities result in the generation of non-hazardous solid wastes, while the laboratory activities result in the generation of diverse chemical and microbiological wastes of varying quantities and toxicities, as well as additional non-hazardous solid wastes. The ESC, classified as a large quantity generator by the State of Maryland, is allowed to accumulate hazardous waste on site for no more than 90 days and can generate more than 1 kg of acutely hazardous waste or more than 100 kg of hazardous waste per month. The ESC s Safety, Health and Environmental Management (SHEM) Manager is also the facility s Hazardous Waste Manager, who along with

the ESC Waste Committee, develops waste disposal policy and procedures for the ESC that are in accordance with all Federal, State, County and Fort Meade requirements for all aspects of facility waste generation, storage and disposal. The ESC Waste Committee normally meets once every two weeks (usually on the first and third Thursday of the month) and is composed of at least one representative from each of the major organizations within the ESC. The Waste Committee is chaired by the ESC SHEM Manager, who also is the Project Officer for the facility s hazardous waste removal contract. Most non-hazardous wastes, and all standard solid wastes, are removed from the facility by the Fort Meade Directorate of Public Works, under the supervision of the ESC Facility Manager.

Although the ESC has only one EPA RCRA generator ID number (MDR000000984), the facility has two separate 90-day hazardous waste storage areas. One of the 90-day hazardous waste storage areas (room J118) is used solely for the storage of hazardous waste generated by the Region III laboratory and field operations, while the other 90-day storage area (room D123) is used solely for the storage of hazardous wastes generated by the Office of Pesticide Programs laboratories. Both of these 90-day hazardous waste storage areas have access restricted to only the ESC SHEM Manager, selected organizational Waste Coordinators and the ESC Facility Manager. Hazardous waste removal from the ESC is structured in such a way as to require monthly hazardous waste pick-ups from the facility. The monthly hazardous waste pickups are performed on an alternating basis between the two 90-day hazardous waste storage areas in the facility, i.e., one month Region III, the next month OPP, the following month Region III again and so forth. By establishing this monthly alternating schedule, the ESC only allows about 60-70 days for the accumulation of hazardous wastes between actual waste pick-ups from either of the 90-day hazardous waste storage rooms (J118 & D123).

The ESC Facility Manager also manages the facility recycling program. Currently, paper, aluminum, glass, cardboard, wooden pallets and some plastics are collected and recycled through the Fort Meade Directorate of Public Works programs. Additional infomation on the waste generation program or specific waste removal procedures for the ESC can be found in the facility s Chemical Hygiene Plan (CHP), Occupant Emergency Plan (OEP), Spill Prevention, Control and Countermeasures Plan (SPCC), the waste removal contract statement of work (SOW), the janitorial services contract SOW, or the Interagency Service Agreement between EPA and Fort Meade.

8. Operation Control: (See Operational Controls Form, separate page)

9. Budget (Resources):

Targets a, b:	SHEM Manager	(25%)	500 hours/year
	Organizational Waste Coordinators	(5.0%)	100 hours/year
	Facility / Asst. Facility Manager	(2.5%)	50 hours/year
	Laboratory Staff	(2.0%)	40 hours/year
	Waste Disposal Contract - $90K/yr		

Environmental Management Program Form

10. Structure, Authorities, Responsibilities

Tasks	Responsible Person/Group
a. Regulatory Review and Regulatory Updates	a. SHEM Manager
b. Hazardous Waste (HW) Management	b. SHEM Manager, Waste Coordinators, Laboratory Staff, HW Removal Contractors
c. Non-hazardous / Solid Waste Management	c. Facility Manager & Asst. Facility Manager
d. Recycling Program Management	d. Facility Manager & Asst. Facility Manager
e. Annual CHP, SPCC, OEP revisions	e. SHEM Manager
f. Emergency Preparedness and Response Programs	f. SHEM Manager
g. Waste Committee Meetings	g. SHEM Manager, Waste Coordinators
h. Record Keeping	h. SHEM Manager, Facility Manager
i. Removal of Hazardous Wastes	i. HW Removal Contractors
Spill Reporting:	
a. Identify and report a spill of hazardous material	a. Occupants/ Employee
b. Secure immediate spill area	b. ESC Security
c. Upon notification of a spill or release, determine if evacuation is necessary, notify appropriate emergency services, coordinate spill clean-up, external reporting	c. SHEM Manager / Facility Manager
d. Increase awareness and involvement of ESC staff regarding their impacts related to waste generation	d. EMS Coordinator/EMS Team

11. Record(s):	**Person Responsible and Record Location:**
a. Hazardous waste manifests	a. SHEM Manager A123
b. DOT Drum Inventory Forms	b. SHEM Manager A123
c. Certificates of Disposal / Treatment	c. SHEM Manager A123
d. Contract Invoices / EPA Receiving Reports	d. SHEM Manager A123
e. Waste Committee Meeting Minutes	e. SHEM Manager A123 local area network
f. Accumulation Area Logbooks	f. SHEM Manager A123, D123,J118
g. Waste Profiles	g. SHEM Manager A123
h. Contractor Field Report Forms	h. SHEM Manager A123
i. Restricted Waste Notification & Certification Forms (Land Ban forms)	i. SHEM Manager A123
j. Non-Hazardous Waste Manifests	j. SHEM Manager A123

Environmental Management Program Form	
k. PCB Waste Logbook & Tracking Forms	k. SHEM Manager A123
l. Biennial Waste Report to the State of MD	l. SHEM Manager A123, A118
m. Internal/external inspection reports	m. SHEM Manager A123
n. Accumulation area inspection logbooks	n. SHEM Manager D123, J118
o. Records of awareness activities performed (training course sign-up sheets, brown-bag lunch announcements, e-mails that raise awareness)	o. EMS Coordinator A236
p. Inventory of recycled materials, including aluminum cans, glass bottles (clear and brown), batteries, wood pallets, paper, and cardboard	p. Asst. Facility Manager A132
q. Training records	q. SHEM Manager A123
r. Pesticide usage report	r. Facility Manager A125
12. Document(s):	**Person Responsible and Record Location:**
a. Chemical Hygiene Plan (CHP)	a. SHEM Manager A123 Local area network
b. Occupant Emergency Plan (OEP)	b. SHEM Manager A123
c. Spill Prevention, Controls and Countermeasures (SPCC) Plan	c. SHEM Manager A123
d. Regulatory Permits (RCRA ID and TSCA / PCB Notification)	d. Facility Manager A136 SHEM Manager A123
e. Janitorial contract, statement of work, and work orders	e. Facility Manager A125
f. Grounds maintenance contract	f. Facility Manager A125
g. Hazardous waste removal contract, statement of work, and work orders	g. SHEM Manager A123
h. Ft. Meade Interagency Service Agreement	h. Facility Manager A125
i. Waste handling procedures, SOPs, flow charts	i. SHEM Manager A123
j. Department of the Army Permit to Other Federal Govemment Department or Agency to Use Property Located on Fort George G. Meade Military Reservation	j. Facility Manager A125
k. Bell Operator and Maintenance Manuals	k. Facility Manager A118
l. Consent decree	l. Facility Manager A125
m. Integrated Pest Management	m. Facility Manager A125
n. Final Installation Pesticide Management Plan for Ft. George G. Meade	n. Facility Manager A125
o. SOPs for EPA Science Center	o. OM&R Contractor A137
p. OM&R Annual Work Plan	p. Facility Manager A125

Environmental Management Program Form

13. Competence of persons responsible on basis of training, education or experience:

Title:	Competence:
a. SHEM Manager	a. Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment
b. Facility Manager	b. Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment
c. Hazardous Waste Contractor	c. Factors in Contract SOW describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment
d. Janitorial Contractor	d. Factors in Contract SOW describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment
e. Organizational Waste Coordinators	e. Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment

Operational Controls Form

Significant Environmental Aspect: **Waste Generation**	Document Control Code: ESC EMP-11.00

1. Activity Group: Hazardous Waste Disposal

2. Activities (and corresponding written controls, where applicable):

a. Hazardous waste management (CHP Section 13)
b. Calibration and maintenance of lab equipment (Bell Operation and Maintenance Manuals, OM&R Annual Work Plan, SOPs for EPA Science Center)
c. Change oil in pumps
d. Sample/ sample container disposal (CHP section 10.1, 13.3)
e. Use of pesticides outside (Grounds maintenance contract)
f. Use of solvents (CHP sections 10.1, 10.2, 10.6 through 10.12 and respective analytical SOPs)
g. Facility operation and maintenance (OM&R Annual Work Plan, SOPs for EPA Science Center)
h. Operation and maintenance of heating/air conditioning (refrigerants)
i. Safety practices/program (PPE, spill clean up, safety showers)
j. Sample collection in field

3. Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable):

a. Hazardous waste disposal procedures (Chemical Hygiene Plan sections 10.13, 10.14, 13)
b. Hazardous waste contract requirements (Statement of work in hazardous waste contract)
c. Use of satellite accumulation areas
d. Restricted access 90-day accumulation areas
e. Secondary containment required for all hazardous materials (Chemical Hygiene Plan section 13)
f. Waste committee meetings and procedures (Chemical Hygiene Plan section 13.1)
g. Annual internal inspection by Region III SHEM Managers
h. Triennial external inspection by EPA HQ (SHEMD)
i. Annual laboratory safety refresher training
j. Applicator reports EPA registration number of chemical, amount, and location applied (Pesticide usage report)
k. Pesticide/herbicide/fertilizer applications must be reported per consent decrees (MOU between U.S. EPA and U.S. DOD with respect to Integrated Pest Management (3/1996), Final Installation Pesticide Management Plan for Ft. George G. Meade (12/2000))

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4. Maintenance plan(s) for the operational controls:

a. Review procedures and contract deliverables periodically
b. Weekly inspections of accumulation areas
c. Review of inspection reports and audit findings by ESC personnel and R3 and HQ staff
d. Investigate spill or hazardous material incidents to prevent & institute new procedures
e. Review training records periodically

5. Actions to be taken if controls fail:

a. Investigate and install additional controls
b. Provide retraining as necessary
c. SHEM Manager implements corrective action changes through Waste Committee and organizational management components
d. Appropriate communications to effected ESC Staff

6. Record(s):	**Person Responsible and Record Location:**	
a. Hazardous waste manifests	a. SHEM Manager	A123
b. DOT Drum Inventory Forms	b. SHEM Manager	A123
c. Certificates of Disposal / Treatment	c. SHEM Manager	A123
d. Contract Invoices / EPA Receiving Reports	d. SHEM Manager	A123
e. Waste Committee Meeting Minutes	e. SHEM Manager	A123 local area network
f. Accumulation Area Logbooks	f. SHEM Manager	A123, D123, J118
g. Waste Profiles	g. SHEM Manager	A123
h. Contractor Field Report Forms	h. SHEM Manager	A123
i. Restricted Waste Notification & Certification Forms (Land Ban forms)	i. SHEM Manager	A123
j. PCB Waste Logbook & Tracking Forms	j. SHEM Manager	A123
k. Biennial Waste Report to the State of Maryland	k. SHEM Manager	A123, A118
l. Internal/external inspection reports	l. SHEM Manager	A123
m. Accumulation area inspection logbooks	m. SHEM Manager	D123, J118
n. Records of awareness activities performed (training course sign-up sheets, brown-bag lunch announcements, e-mails that raise awareness)	n. EMS Coordinator	A236
o. Training records	o. SHEM Manager	A123
p. Pesticide usage report	p. Facility Manager	A125

7. Responsibilities: (a. to ensure controls are in place; b. to ensure controls keep working; c. to take action when controls fail; d. to create and keep records relative to operational controls)

Title	Responsibility

Operational Controls Form	
a. SHEM Manager	a. Ensures controls are in place and working. Maintains relevant records. Investigates and precipitates corrective actions when controls fail.
b. Facility Manager	b. Ensures controls are in place and working. Maintains relevant records. Investigates and precipitates corrective actions when controls fail.
c. Hazardous Waste Removal Contractor	c. Packages, transports and disposes of hazardous wastes in accordance with the contract specifications and applicable regulations.
d. Janitorial Contractor	d. Packages, transports and disposes of solid wastes in accordance with the contract specifications and applicable regulations.
e. Organizational Waste Coordinators	e. Ensures controls are in place and working. Maintains relevant records. Investigates and precipitates corrective actions when controls fail.
f. Laboratory Staff	f. Follow all applicable controls, procedures and practices for handling and disposing of hazardous wastes.
g. Organizational Management	g. Ensures controls are in place and working. Participates in investigations and corrective actions when controls fail. Responsible to ensure that all other responsibilities are being fully met.

8. Competence of operators on the basis of training, education or experience:

Title	Competence
a. SHEM Manager	" Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. " Attendance at annual national EPA SHEM Conferences " Networking with other SHEM Managers " CFR updates

Operational Controls Form	
b. Facility Manager	" EPA Headquarters updates & correspondences " EPA, DOD and private regulatory publications " Regulatory E-mail updates " Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. " Attendance at annual national EPA Facility Manager Conferences " Networking with other Facility Managers " CFR updates " EPA Headquarters updates & correspondences " Regulatory E-mail updates
c. Hazardous Waste Removal Contractor	" Factors in Contract SOW describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment.
d. Janitorial Contractor	" Factors in Contract SOW describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment.
e. Organizational Waste Coordinators / Laboratory Staff	" Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. " Attendance at annual training courses

Operational Controls Form

Significant Environmental Aspect: **Waste Generation**	Document Control Code: ESC EMP-11.00

1. Activity Group: Non-hazardous Waste Disposal, see also EMP for Paper Consumption

2. Activities (and corresponding written controls, where applicable):

a. Analysis of Samples/Preparation (Chemical Hygiene Plan sections 10.13, 10.14, and 13)
b. Calibration and maintenance of lab equipment (Bell Operation and Maintenance Manuals, OM&R Annual Work Plan, SOPs for EPA Science Center)
c. Changing oil in pumps
d. Construction
e. Lab neutralization usage (Bell Operation and Maintenance Manuals, OM&R Annual Work Plan, SOPs for EPA Science Center tab 9)
f. Manage nonhazardous waste (Janitorial contract statement of work)
g. Sample/Sample Container Disposal (CHP section 10.1, 13.3.3))
h. Use of pesticides outside (Grounds maintenance contract/subcontract statement of work)
i. Use of Solvents (Chemical Hygiene Plan sections 10.1, 10.2, 10.6 through 10.12 and respective analytical SOP)
j. Charging, Discharging, and Maintaining 25,000 Gallon Fuel Tank (SOPs for EPA Science Center, Tab 8; SPCC Appendix D)
k. Eating in lunchroom/food preparation
l. Facility cleaning (cleaning products and equipment)
m. Facility maintenance and operation
n. Handling, Storage, and Use of Biological Agents (Chemical Hygiene Plan section 11.0)
o. Maintenance of government owned vehicles and boats, including mobile lab
p. Operation and maintenance of heating/air conditioning (refrigerants)
q. Safety Practices/Program such as PPE, spill clean up, safety showers (Chemical Hygiene Plan; Spill Prevention, Control, and Countermeasures Plan; and Occupant Emergency Plan)
r. Sample collection in field
s. Use of autoclaves, dishwashers, in-house laboratory analytical and safety & health instrumentation

Operational Controls Form

3. Operational Controls such as technological, operational, procedural (and corresponding written controls, where applicable):

a. Solid waste disposal procedures and contract requirements (Interagency Service Agreement)
b. Recycle bins for paper, aluminum, glass and some plastics placed in strategic areas
c. Inspection of recycled materials
d. Waste committee meetings and procedures
e. Annual internal inspection by Region III SHEM Managers
f. Triennial external inspection by EPA Headquarters (SHEMD)
g. Annual laboratory safety training
h. Pesticide/herbicide/fertilizer applications must be reported per consent decrees (MOU between U.S. EPA and U.S. DOD with respect to Integrated Pest Management (3/1996), Final Installation Pesticide Management Plan for Ft. George G. Meade (12/2000))
i. Storm drain system and catch basin are designed to contain an uncontrolled spill. (Annual Facility Inspection Checklist in SPCC Appendix D)
j. Applicator reports EPA registration number of chemical, amount, and location applied (Pesticide usage report)

4. Maintenance plan(s) for the operational controls:

a. Review procedures and contract deliverables periodically
b. Review of inspection reports and audit findings by ESC personnel and R3 and HQ staff.
c. Investigate incidents to prevent & institute new procedures
d. Review training records periodically
e. Periodic reminders to staff about recycling and solid waste program

5. Actions to be taken if controls fail:

a. Investigate and install additional controls
b. Provide retraining as necessary
c. SHEM Manager implements corrective action changes through Waste Committee, Facility Manager and organizational management components
d. Appropriate communications to affected ESC staff

6. Record(s):	**Person Responsible and Record Location:**	
a. Waste Committee Meeting Minutes	a. SHEM Manager	A123 local area network
b. Contract invoices / EPA receiving reports	b. SHEM Manager	A123
c. Non-Hazardous Waste Manifests	c. SHEM Manager	A123
d. Internal/external inspection reports	d. SHEM Manager	A123
e. Records of awareness activities performed (training course sign-up sheets, brown-bag lunch announcements,	e. EMS Coordinator	A236

Operational Controls Form		
e-mails that raise awareness) f. Inventory of recycled materials, including aluminum cans, glass bottles (clear and brown), batteries, wood pallets, paper, and cardboard	f. Assistant Facility Manager	A132
g. Pesticide usage report	g. Facility Manager	A125

7. Responsibilities: (a. to ensure controls are in place; b. to ensure controls keep working; c. to take action when controls fail; d. to create and keep records relative to operational controls)

Title	Responsibility
a. SHEM Manager	a. Ensures controls are in place and working. Maintains relevant records. Investigates and precipitates corrective actions when controls fail.
b. Facility Manager	b. Ensures controls are in place and working. Maintains relevant records. Investigates and precipitates corrective actions when controls fail.
c. Janitorial Contractor	c. Packages, transports and disposes of solid wastes in accordance with the contract specifications and applicable regulations.
d. Organizational Waste Coordinators	d. Ensures controls are in place and working. Maintains relevant records. Investigates and precipitates corrective actions when controls fail.
e. Laboratory Staff	e. Follow all applicable controls, procedures and practices for handling and disposing of solid wastes.
f. Organizational Management	f. Ensures controls are in place and working. Participates in investigations and corrective actions when controls fail. Responsible to ensure that all other responsibilities are being fully met.

8. Competence of operators on the basis of training, education or experience:

Title	Competence
a. SHEM Manager	" Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect,

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	personal contacts, purpose of contacts, physical demands and work environment. " Attendance at annual national EPA SHEM Conferences " Networking with other SHEM Managers " CFR updates " EPA Headquarters updates & correspondences " EPA, DOD and private regulatory publications " Regulatory E-mail updates
b. Facility Manager	" Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. " Attendance at annual national EPA Facility Manager Conferences " Networking with other Facility Managers " CFR updates " EPA Headquarters updates & correspondences " Regulatory E-mail updates
c. Hazardous Waste Removal Contractor	" Factors in Contract SOW describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment.
d. Janitorial Contractor	" Factors in Contract SOW describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment.
e. Organizational Waste Coordinators/ Laboratory Staff	" Factors in Position Description describe knowledge required by the position, supervisory controls, guidelines, complexity, scope and effect, personal contacts, purpose of contacts, physical demands and work environment. " Attendance at annual training