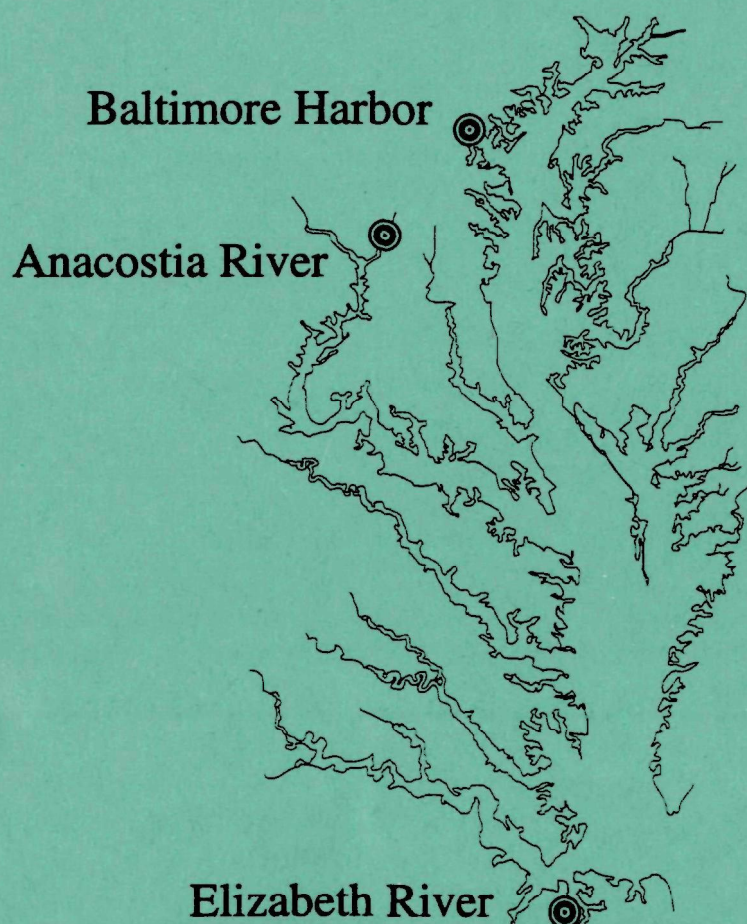


# Chesapeake Bay Regional Action Plans Development Guidelines



## Chesapeake Bay Program

# Chesapeake Bay Regional Action Plan Development Guidelines

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April 1997



**CHESAPEAKE BAY REGIONAL ACTION PLAN  
DEVELOPMENT GUIDELINES**

Prepared under Contract 68-D3-0030

for

Chesapeake Bay Program Office  
U.S. Environmental Protection Agency  
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# **CHAPTER 1**

## **INTRODUCTION**

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**CHAPTER 1. INTRODUCTION**

The 1994 *Chesapeake Bay Basinwide Toxics Reduction and Prevention Strategy* emphasized using a regional focus to address chemical contaminant-related problems in the Chesapeake Bay. Guided by the objective,

*Direct reduction and prevention actions toward regions with known toxic problems as well as areas where significant potential exists for toxic impacts on living resources and habitats, and more directly involve the locally affected community and stakeholders,*

the Chesapeake Bay Program is establishing a process for characterizing and designating areas of the Bay as Regions of Concern (e.g., areas with known chemical contaminant-related impacts)<sup>1</sup>, and developing Regional Action Plans to guide the cooperative efforts needed to restore and protect the designated Regions of Concern. This guidance document presents an overview of the regional action planning process and an approach for developing Regional Action Plans. A separate document (see Appendix A—*Chesapeake Bay Chemical Contaminant Geographical Targeting Protocol* [Chesapeake Bay Program, 1995]) describes the process the Chesapeake Bay Program will use to identify Regions of Concern within the Chesapeake Bay basin.

The first step in the regional action planning process is for the Chesapeake Executive Council to designate an area as a Region of Concern. The Executive Council designated three areas (i.e., the Elizabeth River in Virginia, Baltimore Harbor in Maryland, and Anacostia River in the District of Columbia and Maryland) in the 1994 *Chesapeake Bay Basinwide Toxics Reduction and Prevention Strategy*; subsequent areas will be designated after completion of the chemical contaminant geographical targeting identification process (see Appendix A).

Once the Executive Council designates a Region of Concern, the next step is to develop and implement a Regional Action Plan. A Regional Action Plan serves as the guidebook for reducing and preventing chemical contamination problems in a designated Region of Concern. Prepared through an active, iterative process involving major stakeholders and the general public, a Regional Action Plan focuses multiagency cooperative efforts and public-private partnerships on planning and implementing the

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<sup>1</sup>Through the Region of Concern identification process, all Chesapeake Bay tidal areas will eventually be classified into one of four categories: (1) Region of Concern, (2) Area of Emphasis, (3) Area with Low Probability for Adverse Effects, and (4) Area with Insufficient Data. An area will be classified as a Region of Concern when the available data indicates both adverse ambient effects and elevated concentrations of chemical contaminants above thresholds associated with adverse effects. In addition, the data must reveal strong evidence for a causal relationship between the observed chemical contaminant stressors and effects.

necessary assessment, reduction, remediation, and prevention actions to restore and protect the designated Region of Concern.

The remaining chapters of this guidance document lead the reader, step by step, through the process of developing a Regional Action Plan. The document describes the elements of a Regional Action Plan, provides guidance on the planning process (e.g., developing stakeholder groups, which are referred to as Regional Action Teams), identifies the information that should be presented in the Regional Action Plan, suggests approaches for obtaining and analyzing the information needed to prepare the written plan, and presents various formats for displaying the information. The information covered in this guidance document is arranged according to the following chapters:

- Overview of the Regional Action Planning Process (Chapter 2)
- Conducting the Regional Action Planning Process (Chapter 3)
- Defining the Plan's Vision, Goals, Objectives, and Milestones (Chapter 4)
- Defining the Problem (Chapter 5)
- Evaluating Existing Management Programs (Chapter 6)
- Developing Implementation Actions (Chapter 7).

In addition, appendices to this document provide additional information.

This guidance was developed after an evaluation of other geographically based water quality planning efforts. It presents a model for developing and presenting Regional Action Plans based on lessons learned in other areas. The document promotes a common, bay-wide approach for addressing region-specific issues and problems in the context of a Regional Action Plan, while at the same time acknowledging that each Region of Concern is unique, with site-specific conditions and problems requiring tailored solutions. The information contained in this guidance document is intended to provide helpful background information needed to conduct an effective regional action planning process and prepare a well-developed Regional Action Plan. Readers desiring a quick summary of the types of information that should be contained in the final Regional Action Plan, including a recommended checklist of requirements for each chapter of a Regional Action Plan, should turn to Appendix B, Overview of Key Components to be Addressed in a Regional Action Plan.

The jurisdictions charged with developing Regional Action Plans are not required to follow verbatim the model proposed in this guidance document. Just as each Region of Concern has a special

set of circumstances (e.g., different chemical contamination problems) that caused its designation, each Regional Action Plan will also be unique, with different goals and objectives.

The approach proposed for developing Regional Action Plans has been used successfully in other areas (e.g., Great Lakes Remedial Action Plans and Puget Sound Watershed Action Plans for Nonpoint Source Pollution) to develop a targeted implementation approach for addressing the unique problems of a specific location. These planning approaches were successful, in large part, because they secured the commitment of stakeholders, particularly those with a vested interest in the Region of Concern, to assist in developing and implementing the plan. In doing so, the plans extended beyond standard regulatory approaches to pollution control and supplemented them with innovative actions that addressed site-specific problems (Hartig and Zarull 1992; National Water Quality Evaluation Project 1992; Puget Sound Water Quality Authority 1993; Wallin and Haberman 1992). The Chesapeake Bay Program envisions using a similar, stakeholder driven process to develop Regional Action Plans.



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## **CHAPTER 2**

### **OVERVIEW OF REGIONAL ACTION PLANNING PROCESS**

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**CHAPTER 2. OVERVIEW OF THE REGIONAL ACTION PLANNING PROCESS**

In designating an area as a Region of Concern, the Chesapeake Executive Council members commit their respective jurisdictions to the regional action planning process, including preparing a Regional Action Plan. Each responsible jurisdiction designates a lead agency (e.g., typically the state environmental office) to oversee plan development and implementation. Once designated, the lead agency has a great deal of flexibility in choosing its approach for completing the plan, although experience gained from similar planning approaches conducted elsewhere shows that the most effective plans are developed when the lead agency works closely with existing groups and/or stakeholders in the Region of Concern. Regardless of the approach implemented, the lead agency is ultimately responsible for ensuring that the Regional Action Plan is delivered to the Executive Council on time, in accordance with the schedule that is determined when the area is designated as a Region of Concern.

This chapter recommends an ideal approach for developing a Regional Action Plan. Although many approaches can be used and should be explored to suit site-specific needs, the steps described in Exhibit 2-1 provide the foundation for a successful plan. This chapter provides an overview of each step in the planning process; subsequent chapters of the guidance lead the reader, step by step through the process of developing a Regional Action Plan.

The overarching goal of each Regional Action Plan is to develop an implementable plan that effectively addresses chemical contamination problems in a Region of Concern. The plan should clearly define the vision, goals, and objectives guiding the process; provide a realistic evaluation of the problems; and summarize the necessary assessment, reduction, remediation, and prevention actions needed to address identified problems. To be effective, the Regional Action Plan must have clearly stated, and measurable, goals and objectives; involve key stakeholders and the general public from project initiation through the planning process; and thoroughly define roles, responsibilities, and commitments for each participant.

One key to developing a successful Regional Action Plan is to involve a representative and balanced stakeholder group (referred to as the Regional Action Team) of interested and affected parties in all stages of the plan development, beginning with defining the problem and establishing a vision statement, goals, and objectives for the plan. It is especially important to involve individuals and/or groups that will play lead roles in implementing the Regional Action Plan, as well as those responsible for completing plan recommendations. The group should comprise key decision-makers, subject matter



**Exhibit 2-1. Steps Needed to Complete the Regional Action Planning Process  
(responsible party)**

- 1. Designate Regions of Concern (Executive Council)**
- 2. Identify Lead Agency (Executive Council)**
- 3. Conduct Preliminary Background Research on Region of Concern (Lead Agency)**
  - Identify existing stakeholder groups, if applicable.
  - Begin summarizing information on problems associated with chemical contamination.
- 4. Establish Multidisciplinary Regional Action Team (Lead Agency, with input from existing groups)**
  - Include representatives of persons affected by or contributing to chemical contamination in the Region of Concern, the lead agency, key decision-makers, and subject matter experts.
- 5. Determine Planning Approach (Lead Agency, with input from existing groups)**
  - Define roles and responsibilities.
  - Develop work plan and schedule (including Regional Action Team meetings and deliverables).
  - Outline methodology for developing Regional Action Plan.
- 6. Obtain Commitments of Key Leaders**
- 7. Develop Preliminary Problem Statement (Lead Agency, with input from existing groups and subject matter experts)**
  - Consult readily available information sources, including the Chemical Contaminant Geographical Targeting Protocol, to develop a preliminary understanding of problems related to chemical contamination within the Region of Concern (i.e., What makes the area a Region of Concern?). Much of the information will most likely come from the chemical contaminant geographical targeting process.
  - Prepare summary background paper or fact sheet for distribution to the Regional Action Team.
- 8. Determine a Vision Statement and Identify Preliminary Goals and Objectives (Regional Action Team)**
  - Use the preliminary assessment of problems as a starting point for determining the desired future state of the Region of Concern. Use stakeholders, technical experts, and public participation to define goals and objectives necessary to achieve the desired future state.

**Exhibit 2-1. Steps Needed to Complete the Regional Action Planning Process  
(responsible party) (continued)**

- 9. Further Define Problems in the Context of Preliminary Goals and Objectives (Lead Agency, Regional Action Team, Existing Groups, Subject Matter Experts)**
  - Identify and rank adverse ambient effects (e.g., fish tumors) caused by chemical contamination.
  - Identify and rank chemicals (e.g., polyaromatic hydrocarbons) and sources (e.g., urban runoff) causing impacts.
  - Prioritize impacts, chemicals, and sources so that effective, targeted, implementation actions can be developed.
- 10. Assess Effectiveness of Existing Management Programs (Lead Agency, Regional Action Team, Existing Groups, Subject Matter Experts)**
  - Identify key regulatory and nonregulatory programs affecting priority problems in the Region of Concern.
  - Evaluate programs to assess effectiveness.
  - Determine where existing programs are not sufficient to reduce or prevent loadings or releases of the chemical contaminants linked with the existing or potential adverse impacts in the Region of Concern.
  - Determine what additional or new actions, both regulatory and nonregulatory, must be taken to effectively reduce the effects related to chemical contamination.
- 11. Revise Preliminary Goals and Objectives (Regional Action Team)**
- 12. Develop Implementation Approach to Address Problems (Lead Agency, Regional Action Team, Existing Groups, Subject Matter Experts)**
  - Identify specific implementation actions.
  - Summarize the primary components of each action, including methodology and linkage to priority problems.
  - Determine the jurisdictions and entities responsible for completion of each step.
  - Develop an aggressive, yet realistic completion schedule including milestones.
  - Define the key monitoring actions, including monitoring frequency and responsible parties, needed to verify the restoration of uses and the reduction/elimination of adverse living resources.
- 13. Compile final Regional Action Plan for Presentation to Executive Council (Lead Agency, Regional Action Team, Existing Groups)**

experts, and representatives of persons affected by or associated with chemical contamination in the Region of Concern.

The process of developing a Regional Action Plan involves many sequential and overlapping tasks. Although outlined in this chapter as steps (Exhibit 2-1), the planning process is iterative; as more knowledge of a Region of Concern is gained throughout the process, the initial problem statement, goals, and recommendations might be enhanced, refined, or revised. The knowledge base for the plan will continue to evolve during the plan's implementation. Therefore, the process should include periods of re-evaluation to ensure that each part of the plan remains applicable and well-designed.

Obviously, the process begins with designation of a Region of Concern (Step 1). After designation, the affiliated jurisdictions name a lead agency, which initiates the Regional Action Planning process (Step 2). The lead agency then assembles available background materials on the Region of Concern and develops a preliminary understanding of problems and current players in the Region of Concern (Step 3). While assembling and evaluating background information, the lead agency might discover that an existing stakeholder group is already active in the Region of Concern. The lead agency may choose to team with this group or to delegate all responsibility for the Regional Action Plan to the group. Regardless of the approach taken, the lead agency, working with existing groups, should name an independent, multidisciplinary Regional Action Team to make decisions and to provide other support for Regional Action Plan development (Step 4). The Regional Action Team should be assembled based on an understanding of the problems, affected parties, and key decision-makers in the Region of Concern. Chapter 3 describes techniques to select a balanced and representative Regional Action Team. A representative from the lead agency should also be included as a member for the Regional Action Team.

Also in these early planning steps, the lead agency, in conjunction with its partner or designee, should prepare a regional action planning work plan, which contains a methodology and timeline for completing the other elements of the plan (Step 5). The work plan should also define an overall mission for the group. The work plan should be distributed to the Regional Action Team in advance of its first meeting so that it can be reviewed and finalized when the group meets.

Prior to the first meeting, the lead agency should also work to secure the commitment of key leaders (Step 6). High level management support is essential to ensuring the ultimate success of the regional action planning process. Demonstrated management support might help to motivate the Regional

Action Team and encourage participation from other entities in the Region of Concern. In addition, high level management support is critical to obtaining staff and financial resources.

The next step in the process (described in Chapter 4), which can be taken while identifying the Regional Action Team members, is for the lead agency and/or its partner or designee to assemble readily available background materials that address the Region of Concern. From these, a summary background paper and/or fact sheet of problems and other issues in the Region of Concern (kept short and brief at this point of the planning process) should be distributed to the Regional Action Team (Step 7). Using these background materials and related presentations to initiate discussion, one of the first planning meetings for the Regional Action Team should be devoted to developing a preliminary problem statement (Step 7) and an overall vision for the Region of Concern and associated preliminary goals and objectives to focus the planning process (Step 8). The process of developing goals and measurable objectives will continue and become more refined (i.e., measurable objectives will be established) throughout the planning process as more is learned about the Region of Concern. The purpose of investing time at the beginning of the process to understand problems is to help focus limited resources on those areas of greatest concern.

After developing preliminary goals and objectives, the next step (discussed in Chapter 5) is to further define the problems (e.g., identifying the types and sources of chemical contaminants and their effects on living resources), in the context of the goals and objectives (Step 9). In situations where there is insufficient background information about the problems to identify preliminary goals and objectives, the Regional Action Team may have to skip ahead to further defining problems (Step 9) before completing the identification of goals and objectives (Step 8).

After evaluating problems and developing a vision statement and preliminary goals and objectives, the regional action planning process focuses on developing an implementation approach. One important aspect of the implementation approach is to assess the effectiveness of existing management programs that address priority problems in the Region of Concern (Step 10). Before completing development of the implementation approach, the Regional Action Team may want to refine or revise its preliminary goals and objectives (Step 11) based on its expanding knowledge base about the Region of Concern. In order to complete the implementation approach, the Regional Action Team must build from its understanding of existing management programs to identify new implementation actions (discussed in Chapter 7), if necessary, that will address problems in the Region of Concern (Step 12). These implementation actions should address the targeted goals and objectives of the Regional Action Plan. During this step, the



Regional Action Team should recruit commitments for implementation from the stakeholders, develop implementation schedules, and make provisions to track implementation progress and identify measures of success.

The information assimilated during each step of the regional action planning process must be assembled into a single document representing the methodology, findings, and recommendations of the Regional Action Team (Step 13). Exhibit 2-2 provides a sample table of contents that can be used as an outline for the Regional Action Plan. After assembling the Regional Action Plan, the Regional Action Team and lead agency present the document to the Chesapeake Bay Program Toxics Subcommittee for review and the Executive Council for formal adoption. Concurrently, the lead agency, Regional Action Team, and other key players (e.g., federal agencies) begin implementation of their commitments according to the Regional Action Plan.

#### **Exhibit 2-2. Recommended Table of Contents for Regional Action Plan**

##### **Executive Summary**

1. Introduction
2. Overview of Regional Action Plan Development Process
3. Goals, Objectives, and Milestones
4. Definition of the Problem
5. Existing Management Programs
6. Implementation Actions

##### **References**

##### **Appendices**

##### **Maps and Overlays**

The remainder of this document provides more detailed information on the steps required to conduct an effective regional action planning process. As mentioned previously, the guidance was developed after an evaluation of other geographically based approaches to water quality planning. Exhibit 2-3 lists the key considerations learned through the evaluation that should be followed to encourage successful regional action planning.

**Exhibit 2-3. Key Considerations for Successful Regional Action Planning****Establishing a Regional Action Team**

- Determine appropriate participants. Represent affected parties (i.e., persons whose use of the Region of Concern is impaired by chemical contamination *and* groups associated with chemical contamination), subject matter experts, and key decision-makers. Involve representatives from groups potentially responsible for implementing aspects of the plan.
- Select a Team that is balanced and representative of all affected parties. One group should not dominate. In most cases, it is inappropriate for more than one individual from a single entity to participate.
- Identify enthusiastic, open-minded, and energetic participants who are committed to the consensus-building process and have time to devote to developing a Regional Action Plan.
- Avoid inviting people not affected by the objective(s) of the Regional Action Plan. Also avoid individuals not committed to the process (e.g., those who are disinterested, unreliable) and/or known meeting "disrupters."
- Aim to have an adequate and balanced stakeholder group that is large enough to have the knowledge and opinions relevant to the planning task, but strive for a manageable group size. For decision-making activities, the optimal group size is 7 to 15 participants.

**Conducting the Regional Action Planning Process**

- Utilize a participatory, team-driven process to develop the Regional Action Plan.
- Involve affected parties (i.e., stakeholders) at each stage of the planning process, including initiation. Involvement in the planning process empowers stakeholders and leads to local ownership of the plan's recommendations. Such involvement promotes long-term commitment and support from key citizenry.
- Identify a leader for each part of the process (e.g., someone to run meetings, someone to coordinate meetings).
- Designate a staff person from the lead agency to coordinate plan development and implementation, including project administration, coordination, and progress reporting.
- Designate core project staff from participating agencies.
- Have clearly defined roles and responsibilities for each part of the process.
- Streamline the planning process by focussing on priority issues.
- Develop a work plan, including a detailed schedule, to guide the planning process.
- Develop clearly stated and measurable goals based on a realistic assessment of the problem and the feasibility of resolution. Throughout the planning process, develop more specific objectives, providing realistic, quantitative targets for each goal. Rank goals and objectives according to priority for action.
- Develop short- and long-term goals. Short-term, achievable goals are important to demonstrate progress to the public to ensure their continued support.

**Exhibit 2-3. Key Considerations for Successful Regional Action Planning (continued)****Conducting the Regional Action Planning Process (continued)**

- Develop written milestones for achieving implementation actions and a system to monitor progress to ensure momentum for plan implementation.
- Build local support through public participation and education.
- Build in mechanisms for plan re-evaluation and revision.

**Defining Problems**

- Focus problem definition investigations on priority goals and objectives. Obtain sufficient (but not excessive) information to develop a sound implementation approach.
- Prioritize problems and focus regional action planning activities on the highest priorities first.
- Maintain discipline and focus when conducting research on problems. Use resources efficiently by focusing on information relevant for decision-making.
- Ensure that the geographic boundaries for the Region of Concern are well defined to encompass the major pollutant sources and "workable" in size so that implementation actions are feasible.

**Developing Implementable Solutions**

- Focus implementation actions on priority problems and causes of those problems.
- Give top priority to projects with a high probability for reversing water quality impairment.
- Identify funding sources and commitments upfront.
- Ensure compatibility of proposed solutions so that actions do not interfere with each other.
- Effectively use existing regulatory and resource management tools.
- Obtain high level management commitment, including allocation of staff and financial resources.
- Encourage political will through public participation and establishment of citizen "watchdog" groups.

**Effectively Measuring Progress**

- Ensure that project goals and objectives are realistic, specific, and measurable.
- Require routine progress reports to track implementation status.

Sources: Hartig and Zarull (1992); Klemans (1993); National Rural Clean Water Program (1992); National Water Quality Evaluation Project (1992); Wallin and Haberman (1992).

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## **CHAPTER 3**

# **CONDUCTING THE REGIONAL ACTION PLANNING PROCESS**

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## **CHAPTER 3**

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**CHAPTER 3. CONDUCTING THE REGIONAL ACTION PLANNING PROCESS**

Regional Action Plans should be developed through a coordinated, consensus-building process overseen by the designated lead agency in the Region of Concern<sup>1</sup> and supported by a stakeholder group, referred to as the Regional Action Team. Although the lead agency has considerable flexibility in its approach to conducting the regional action planning process, the Chesapeake Bay Program expects the lead agency to:

- Develop and deliver a Regional Action Plan to the Chesapeake Executive Council within a designated timeframe
- Use a regional action planning process that considers all stakeholder interests
- Identify and work in consultation with the Regional Action Team throughout the planning process, particularly when identifying priorities, determining an overall project vision, setting goals and objectives, and developing implementation actions and milestones
- Work with the Regional Action Team to include the public in the planning process.

This chapter presents background information useful for conducting the regional action planning process. The chapter describes the anticipated activities of the lead agency and the Regional Action Team in developing a Regional Action Plan, presents information on conducting Regional Action Team meetings and building consensus, and discusses the importance of public participation and education. This information is presented in the following sections of the chapter:

- Overview of the Lead Agency's Involvement
  - Assembling an Effective Regional Action Team
  - Identifying Potential Regional Action Team Members
  - Identifying Regional Action Team Leaders
  - Obtaining Management Support
- Overview of the Regional Action Team's Involvement
  - Identifying Stakeholder Interests
  - Evaluating Environmental Problems and Establishing a Vision Statement, Goals and Objectives
  - Evaluating Existing Management Programs
  - Determining Implementation Actions

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<sup>1</sup>Lead agencies are designated by the jurisdiction(s) containing a Region of Concern.

- Developing a Work Plan
- Conducting Effective Regional Action Team Meetings
- Approaches to Building Consensus
- Public Participation and Education.

Although the guidance recognizes that each Region of Concern is a unique location, with site-specific considerations, the suggestions presented in this chapter apply to most situations and will help determine an efficient and successful regional action planning outcome. Three overarching considerations that apply to all aspects of the planning process include:

- **Someone must coordinate the entire regional action planning process.** The process involves many different steps and participants. In order to keep the process on track, in an orderly and efficient manner, one person should be responsible for mapping each step of the process, assigning roles and responsibilities, and ensuring that tasks get completed on time. This Regional Action Plan coordinator should be affiliated with the group responsible for writing the final plan and delivering it to the Executive Council (generally this group is the lead agency).
- **Roles and responsibilities for each step of the planning process must be clearly defined.** Regional action planning involves many different tasks, including conducting background research, preparing written materials, providing logistical support for Regional Action Team meetings, running Regional Action Team meetings, facilitating decision-making, and writing the final plan. Because different people will be involved in each of these steps, it is essential to clarify, upfront, the roles and responsibilities of each participant. This will clarify the overall approach, ensure efficient participation, and avoid duplication of effort.
- **Each step of the planning process must have a leader.** In addition to the overall plan coordinator, each step of the process must have a discrete leader. Absence of a leader can lead to confusion about roles and responsibilities, cause the process to get off-track, and frustrate participants who are unclear about the best way to participate.

The rationale for having an overall coordinator, defining roles and responsibilities, and identifying leaders for the regional action planning process is simple and straightforward. Regional action planning must occur in an orderly, efficient, and timely fashion so that momentum is maintained, participants' commitment and enthusiasm to the planning process remain high, and goals and objectives are achieved. Defining roles and responsibilities early in the process helps to establish the road map necessary to ensure effective planning. Poorly organized efforts, without a clearly stated mission and understanding of individual and group responsibilities, often fail to achieve the ultimate goal of the regional action planning



process—to develop an implementable plan, representative of the diverse interests in the Region of Concern, that will reduce and prevent problems associated with chemical contamination.

Stakeholder involvement from the early stages is critical to the ultimate success of the Regional Action Plan. Stakeholders are represented through a well-selected Regional Action Team comprised of a diverse group of participants interested in, affected by, or contributing to chemical contaminant-related issues in the Region of Concern. Potential stakeholders for inclusion on the Regional Action Team include representatives from local, state and federal governments; industrial and commercial sectors; citizen and environmental groups; and academic institutions.

Involving stakeholders in the decision-making process leads to local ownership of the Regional Action Plan and a sense of stewardship for the Region of Concern. The coalitions built through an effective stakeholder process will strengthen the Regional Action Plan by elevating the priority given to certain implementation actions, obtaining commitments (e.g., staff resources, funding) for implementation, and engendering trust among diverse interests. In addition, stakeholder commitment is necessary because of the level of political, legal, and behavioral change necessary to achieve some regional action planning goals and objectives. Because of the variety of political bodies and agencies potentially involved in the watersheds linked to a Region of Concern, governmental commitment is also key to affecting change. Most of the implementation actions needed to address a Region of Concern, whether regulatory or nonregulatory, are beyond the conceptual, institutional, and financial reach of any single agency or group and require intra-agency collaboration, public-private partnerships, and stakeholder commitment.

In addition to the Regional Action Team directly involved in plan development, the sustained interest and involvement of the general public is necessary to maintain momentum. The general public can be influential in ensuring that actions are pursued. They can help keep the process focused and, by serving as citizen "watchdogs," can achieve greater accountability from those charged with implementing specific plan recommendations. The general public can also provide technical input to plan development by contributing information and opinions to define problems, assessing existing programs, and determining implementation actions. Citizen groups can also be established to contribute directly to plan implementation by establishing citizen monitoring networks, promoting cleanup days, or initiating other actions. An informed public can provide valuable resources to the regional action planning process, and efforts should be taken, from the start, to ensure public participation.

**Exhibit 3-1. Roles and Responsibilities**

<b>Stakeholder</b>	<b>Role/Interests</b>	<b>Responsibility</b>	<b>Comments/Other Considerations</b>
<b>Lead agencies</b>	Manage plan development in cooperation with stakeholders (i.e., Regional Action Team) and form institutions with public involvement and commitment	Protect water quality and develop and implement a Regional Action Plan	Establish and coordinate the team and provide technical and financial resources
<b>Responsible agencies (federal, state, and local)</b>	Support plan development and pursue various public interests	Assist lead agencies and commit technical and financial resources; participate in relevant implementation actions	Exercise jurisdiction over resources or management decisions
<b>Industry and local businesses</b>	Ensure business interests are represented in the plan	Contribute technical expertise, time, and funding; participate in relevant implementation actions	Educate the public and inform constituencies of progress and issues
<b>Citizen/environmental groups</b>	Ensure environmental protection issues are represented in the plan	Attend meetings, perform outreach, serve as watch dog for planning process, participate in plan implementation	Educate the public and inform constituencies of progress and issues
<b>Educational institutions</b>	Ensure that scientific and other educational information is disclosed	Provide subject area expertise and perform outreach, technical research, and monitoring	Make grants available to support such projects
<b>General Public</b>	Attend public meetings/hearings and other events about the Region of Concern. Contribute ideas, opinions, and information.	Become informed and serve as "watchdogs" for plan implementation. Maintain political pressure. Take personal responsibility for actions that will improve conditions in the Region of Concern (e.g., recycle, minimize use of hazardous chemicals).	Informing the public early on and throughout the process is a good way to maintain momentum and pressure to ensure implementation.

Exhibit 3-1 provides an overview of the types of key players likely to be active in the regional action planning process. The exhibit outlines major roles and responsibilities and describes the interests of these stakeholders, including lead agencies, other government agencies, industry and local business, citizen/environmental groups, and educational institutions. Later sections of this chapter describe a process for selecting a balanced and representative Regional Action Team from these types of groups.

### **3.1 OVERVIEW OF THE LEAD AGENCY'S INVOLVEMENT**

The lead agency is designated by the jurisdiction(s) having a Region of Concern to oversee the regional action planning process, including plan development and implementation. The lead agency's responsibilities include establishing and coordinating the Regional Action Team, providing technical and financial resources, and offering leadership for the regional action planning process. It is very important that the lead agency be committed to the regional action planning process and work with the Regional Action Team to gather support from elected officials.

The lead agency has a great deal of flexibility in choosing an approach for implementing the regional action planning process. Bearing in mind that the ultimate responsibility of the lead agency is to deliver a Regional Action Plan to the Chesapeake Executive Council by an established deadline, the lead agency can use, or modify, one of several approaches depending on the level of public and stakeholder commitment required to develop and implement the Regional Action Plan, and available funding and other resources:

- Maintain full responsibility for plan development, using the Regional Action Team in an advisory capacity (e.g., reviewing and commenting on materials prepared by the lead agency)
- Share responsibility with the Regional Action Team (e.g., identify the various tasks needed to complete the plan and divide responsibilities according to expertise and ability/willingness to contribute)
- Delegate all authority for plan development to the Regional Action Team (e.g., lead agency may provide technical support, but Regional Action Team has full control in guiding the planning process and making recommendations).

Regardless of the approach taken, it is essential to clearly define roles and responsibilities at the outset. If the lead agency chooses to delegate some or all of its authority to an existing group, it might want to develop a formal or informal memorandum of understanding clearly stating roles, responsibilities, and expectations of the groups involved. If such clarification of roles and responsibilities is not offered early in the planning process, involved parties, including Regional Action Team members, might become confused, frustrated, and disillusioned with the process.

Experience suggests that the most effective approach is one of shared responsibility between the lead agency and the Regional Action Team (Chesapeake Bay Program 1990; Davidson 1994; Harris 1994; Schramik 1994; Shuyler 1994; Swiniuch 1994; Hartig et al. 1994). This approach is often successful because it utilizes the technical and financial resources of the lead agency, while seeking the energy, creativity, support, and commitment from the stakeholders who will ultimately determine the plan's success. Regardless of the approach used by the lead agency, it is important that adequate time be allocated for plan research and development in order to generate a sound, credible, and implementable plan. The lead agency, working with the Regional Action Team, should try to identify and seek involvement from all significant stakeholders and thoroughly understand stakeholder interests. The Regional Action Team should also be given sufficient time and resources to conduct the decision-making process needed to develop a sound implementation approach (e.g., identifying a complete range of implementation actions, such as nonpoint source control techniques, pollution prevention plans, legislative

changes, funding, public involvement). By following this process, it is more likely that the solutions developed will be more acceptable to the team and innovative than a plan produced by a single agency.

### **3.1.1 Assembling an Effective Regional Action Team**

One of the most important early responsibilities of the lead agency is to assemble an effective Regional Action Team. Although many factors determine team effectiveness, it is of utmost importance that the team be balanced and representative of key stakeholders in the Region of Concern. When assembling the team, the lead agency may want to start with existing stakeholder groups (e.g., the Anacostia Watershed Restoration Committee, the Elizabeth River Project) or develop a new group, drawing members from existing stakeholder groups. As one of its first steps in the planning process, the lead agency should conduct enough background research on the Region of Concern to identify groups and/or individuals already active in the Region of Concern. Depending on the situation in the Region of Concern, the lead agency should coordinate with existing stakeholder groups or active individuals, or invite other involved parties (e.g., local governments) to join an initial selection committee (formal or informal) to assemble the Regional Action Team. The lead agency, in conjunction with its partners in the Region of Concern (e.g., selection committee) should determine the size and structure of the Regional Action Team and identify affected parties (i.e., persons/groups associated with or affected by chemical contamination in the Region of Concern), key decision-makers, and subject matter experts to include as participants on the Regional Action Team. When identifying groups and/or individuals to assist in the Regional Action Team selection process, and again when identifying potential team members, it is important to have the participation of individuals who adequately represent the wide variety of interests of those affecting and being affected by chemical contamination problems in the Region of Concern. It is especially important to involve individuals and/or groups that will play lead roles in implementing the Regional Action Plan. Section 3.1.2 of this guidance provides more specific direction on a process that can be used to identify and select Regional Action Team members.

Although it is critical to include representative stakeholders on the Regional Action Team, it is also important to keep the group size manageable—no more than 15 to 20 members are suggested (optimal size is 7 to 15). This smaller number gives the group flexibility and allows it to operate in an efficient manner. It also enhances the consensus-building process, which is essential to the ultimate success of the Regional Action Plan. Although larger groups are possible, it becomes harder to ensure equitable involvement from all team members, and the decision-making process may be more unwieldy. If a group larger than 15 or 20 individuals is required, it may be necessary to form subcommittees (e.g., by source of pollution/land use category). To make drafting the Regional Action Plan workable, a

drafting subcommittee, including approximately five members, may be formed. Alternatively, if resources are available, it may be possible for the lead agency to provide staff and/or contractor support to assemble background materials needed to develop the Regional Action Plan. If such "outside" sources, or even a drafting subcommittee of the Regional Action Team, are used to prepare sections of the Regional Action Plan, all stakeholders comprising the Regional Action Team should agree on the input using a consensus-based approach. Section 3.5 in this chapter ("Approaches to Building Consensus") provides an overview of several approaches to building consensus.

Regional Action Team members should be enthusiastic and energetic about the planning process, have leadership abilities, and be committed to the consensus approach to decision-making. Ideally, the members should have technical familiarity with the issues facing the Region of Concern, but be involved in management to the extent that they can influence the decision-making processes of the organizations they represent. The members should also be able to speak with confidence about the feasibility of putting the proposed implementation approach to work. It is important to involve both those who can contribute to the planning process and those who can contribute to the implementation of the Regional Action Plan.

While it may be tempting to include only supporters of the regional action planning process on the Regional Action Team, it is crucial to select team members representing all affected parties, especially those that might be responsible for implementing a particular plan recommendation. By including representatives from potentially resistant groups (e.g., a major contributor of chemical contamination) in the early stages of the planning process, it may be possible to allay fears, build trust, and develop an implementable plan that avoids potential pitfalls from the lack of cooperation and resistance that could occur if affected parties feel excluded from the planning dialogue. When seeking to include members from potentially resistant groups, it is helpful to identify individuals from those groups who will give the process a chance, agree to use a consensus-based approach, and are willing to participate.

Exhibit 3-2 summarizes selected issues key to assembling an effective Regional Action Team. If these concerns are considered and a strong commitment to a consensus-based process using stakeholders is pursued, then it should be possible to develop a sound, implementable plan. However, there is no guarantee that any one team will succeed. Participants should look for warning signs and avoid pitfalls, such as those listed in Exhibit 3-3.

**Exhibit 3-2. Key Elements to Establishing a Regional Action Team**

- Determine appropriate participants. Represent affected parties (i.e., persons whose use of the Region of Concern is impaired by chemical contamination *and* groups associated with chemical contamination), subject matter experts, and key decision-makers. Ideally, participants should be able to represent groups of affected parties (e.g., trade associations, coalition of several environmental organizations) rather than individual entities (e.g., a single facility). Involve representatives from groups potentially responsible for implementing aspects of the plan.
- Select a team that is balanced and representative of all affected parties. One group should not dominate. In most cases, it is inappropriate for more than one individual from a single entity to participate.
- Identify affected parties and other potential Regional Action Team members by initially examining available information on the nature of problems in the Region of Concern. After gaining a preliminary understanding of problems in the Region of Concern, identify the types of affected parties associated with each problem. Seek out existing organizations and/or individuals active in the Region of Concern for advice on potential Regional Action Team members.
- Identify enthusiastic, open-minded, and energetic participants who are committed to the consensus-building process and have time to devote to developing a Regional Action Plan.
- Avoid inviting people not affected by the objective(s) of the Regional Action Plan. Also avoid disinterested, unreliable individuals, and/or known meeting "disrupters."
- Aim to have an adequate and balanced stakeholder group that is large enough to contain the knowledge and opinions relevant to the planning task, but strive for a manageable group size. For decision-making activities, the optimal group size is 7 to 15 participants. If more participants are needed, consider establishing smaller subgroups.
- Seek continuity of process and a balanced and representative group at all times by having team members designate an alternate in case they are unable to attend a meeting.

**Exhibit 3-3. Reasons Why Consensus Groups Fail**

- Failure to produce a plan that represents the interests of all significant stakeholders. This is often caused when certain stakeholders, such as environmental groups, do not join the team. Groups who do not join the team usually attack what they do not like in the draft plan when it is presented for lead agency review or review by the governing body. Therefore, it is important to make every effort to involve each significant stakeholder group in the process directly or indirectly (e.g., by becoming a corresponding member who receives meeting notes and is contacted regularly for ideas and opinions).
- Members walk away from the process or do not commit to the process. This is usually because team members believe their interests can be represented better in another way (e.g., in court, directly with elected officials).
- The team fails to deliver a Regional Action Plan that is adequate to guide implementation. Without clear goals and objectives and strong leadership, teams tend to produce vague plans that do not resolve major issues (e.g., specific implementation tools, such as farm pollution prevention plans to control urban and agricultural runoff).
- The team loses momentum, thereby causing key members to abandon the process. Loss of momentum is usually caused by inefficient and poor process management and getting bogged down on difficult issues.

### **3.1.2 Identifying Regional Action Team Members**

Stakeholder groups, such as the Regional Action Team, should be balanced and represent key decision-makers and affected parties (i.e., persons/groups associated with or affected by chemical contamination) in the Region of Concern. To determine which stakeholders should participate in the Regional Action Team, it is necessary to examine the nature of the chemical contamination problems in the Region of Concern. The lead agency, in conjunction with a formal or informal selection committee,<sup>2</sup> should assemble and analyze readily available information (e.g., written documentation, personal contact with knowledgeable individuals) to develop a preliminary overview of problems in the Region of Concern. This understanding of problems is the necessary first step for identifying parties affected by or contributing to beneficial use impairment and/or other adverse effects of chemical contamination. After understanding the problems, it is possible to link candidate stakeholder groups and individual representatives of those groups to the problems. Each step of the process to identify Regional Action Team members is summarized below:

- **Assess Nature of Problems**—Lead agency, working with existing stakeholder groups and/or individuals active in the Region of Concern, conducts preliminary investigations to determine the nature of chemical contamination problems in the Region of Concern. Readily available written material (e.g., technical reports, newspaper articles), supplemented by discussions with informed groups or individuals, should be assembled and summarized.
- **Identify Stakeholder Categories to be Represented on the Regional Action Team**—Information on problems and sources of problems provide the basis for identifying the types of stakeholders that should be represented on the Regional Action Team. The lead agency, in consultation with other key groups and/or individuals, develops a generic list of stakeholder categories (e.g., fishing industry, property owners, chemical industry, environmental groups) that should be included.
- **Identify Actual Representatives from Generic Stakeholder Categories**—The lead agency, in consultation with other key groups and/or individuals, analyzes background information to match specific names with stakeholder categories. A review of the literature, but more likely personal knowledge/recommendations from groups and/or individuals already involved in the Region of Concern, will help to identify specific persons associated with each generic stakeholder category. Efforts should be made to identify individuals that represent groups of stakeholders (e.g., an industry association or business group that captures multiple business/industry groups in the Region of Concern). It is important to avoid duplication—there is no need for two or more representatives from any particular stakeholder category; certainly not from the same location/facility/group.

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<sup>2</sup>The lead agency may want to coordinate with existing groups and/or individuals (e.g., an existing stakeholder group such as the Elizabeth River Project or the Anacostia Watershed Restoration Committee) active in the Region of Concern, as well as other involved parties (e.g., local governments) to form a Regional Action Team Selection Committee.

Exhibits 3-4 and 3-5 provide an example of the process of identifying Regional Action Team members. Exhibit 3-4 illustrates each step of the process, while Exhibit 3-5 displays a hypothetical list of stakeholder categories developed from the example in Exhibit 3-4.

In addition to the lead agency, the likely stakeholders to be involved in the process include other relevant local, state, and federal agencies; industry and other business organizations; citizen/environmental groups; and educational institutions. Other organizations and individuals that may be stakeholders include commercial and recreational fishing groups, landowners, homeowner associations, and community organizations, such as civic groups and churches. Ethnic and minority group participation should be a priority.

The ideal candidate for a Regional Action Team is enthusiastic, energetic, and committed to a consensus-building planning process; has leadership abilities; is technically familiar with issues in the Region of Concern and is a key decision-maker and/or connected to management so that he or she can speak with some reliability and commitment about the organization's resources and ability to participate; is willing to contribute to the planning process and/or plan implementation. It is important to match up a region's problems with appropriate team members. For example, if contaminated dredging materials are a problem in one area, the Regional Action Team should probably include representatives from local ports and the U.S. Army Corps of Engineers. If urban nonpoint source runoff is a concern, the team should probably include city planners, developers, and property owners. For regions affected by agricultural runoff, agricultural stakeholders should be invited to join the team. Exhibit 3-6 lists potential stakeholders representing various interests and matches them with associated problems.

If the lead agency is uncertain about whether to include certain stakeholders, it is possible to rank potential stakeholders by their expected level of impact on the planning process, as well as by process impacts on them. For instance, certain stakeholders may have more influence on the process than others. Similarly, the outcome of the process (e.g., specific cleanup and funding commitments) may affect stakeholders differently. Other ranking or selection factors include anticipated commitment to the process and the expertise and skills the team requires. Because the regional action planning process occurs over an extended period of time, may require participation in meetings and materials preparation, including possibly drafting portions of the plan, it is important to select members—public and private—who have the time and resources to make this commitment. Because the Regional Action Plan will be a technical, as well as a policy, document, the team should include scientists and engineers.



**Exhibit 3-4. Example of Procedure to Identify Participants  
for the Regional Action Team**

- **Assess Nature of Problems**—Attaboy Creek was designated by the Executive Council as a Region of Concern. The state Department of Environment was designated as the lead agency but is sharing responsibility with an existing group, "Friends of Attaboy Creek." The Department of Environment, working closely with Friends of Attaboy Creek leaders, assembled and reviewed all readily available background materials. Reports developed by several State agencies and a local university documented many ways that chemical contamination has affected the aquatic living resources in the Attaboy Creek Region of Concern—straining the fish and shellfish populations, causing physical deformities, and destroying the fishing industries. The background information, supplemented by several conversations with university professors and State officials, suggests that most of the chemical contaminants are heavy metals and organics. Given the land use and industrial base of the area, experts suggest that the identified problems are most directly a result of industrial and manufacturing discharges, shipyard discharges, and nonpoint source runoff from commercial and industrial areas. Preliminary research summarized in the background material also suggests such linkages between problems and sources.
- **Identify Stakeholder Groups to be Represented on the Regional Action Team**—After assessing the background materials, the state Department of Environment and its partner, Friends of Attaboy Creek, objectively identified the groups being harmed by chemical contamination (e.g., fisheries) and the groups contributing to or responsible for sources contributing to chemical contamination (e.g., shipyards, municipal planners responsible for storm water control). The Department of Environment and Friends of Attaboy Creek leaders compiled these stakeholder categories into a table (see Exhibit 3-5) to use as the basis for identifying actual representatives, (i.e., individual names) from the stakeholder groups.
- **Identify Actual Representatives from Generic Stakeholder Group Categories**—The lead agency in consultation with other key groups and/or individuals, analyzes background information to match specific names with stakeholder categories. A review of the literature, but more likely personal knowledge/recommendations from groups and/or individuals already involved in the Region of Concern, will help to identify specific persons associated with each generic stakeholder category. Efforts should be made to identify individuals that represent groups of stakeholders (e.g., an industry association or business group that captures multiple business/industry groups in the Region of Concern). It is important to avoid duplication—there is no need for two or more representatives from any particular stakeholder category; certainly not from the same location/facility/group. For example, John Doe may represent an association of shipyards in the Region of Concern. Because he represents multiple shipyards, he would be a good candidate for the Regional Action Team.

Available sources on potential stakeholders are extensive, including surveys of existing stakeholder groups active in the Region of Concern; the *Chesapeake Bay Program Directory*, published annually by the Chesapeake Bay Program Office; local Chamber of Commerce directories; industry directories; lists of government agencies in the area; lists of individuals who have participated in relevant meetings/hearings organized by agencies (e.g., National Pollutant Discharge Elimination System [NPDES] public hearings on draft permits, Chesapeake Bay Program Tributary Strategy hearings); and lists of members of the environmental and conservation community (e.g., annually published *National Wildlife Federation Conservation Directory*). Local planning documents, environmental impact studies, and directories of local planning and economic development commissions may also be useful sources of

**Exhibit 3-5. Example of a Stakeholder Category Table Used to Identify Participants for the Regional Action Team**

<b>Stakeholder</b>	<b>Reason for Inclusion</b>
<b>Business/industry</b>	Industry and manufacturing are the primary causes of the toxics problems within the Attaboy Creek Region of Concern. Businesses are affected directly by the success of industry. Involving these interests in the planning process may help to develop a more easily accepted plan and may reduce opposition. The main businesses and industry active in the Attaboy Creek Region of Concern are marinas and shipyards, chemical manufacturing plants, and petroleum refineries.
<b>Citizen/environmental groups</b>	Citizens are affected daily by the conditions in which they live. Environmental organizations exist to protect the interests of the citizens and wildlife affected by the health of the environment. The primary citizens groups are the Rotary Club, Jaycees, local garden clubs, and local Parent Teachers Associations. The most active environmental organizations are the Sierra Club and Friends of Attaboy Creek.
<b>Federal government</b>	Federal Government involvement is beneficial in the implementation of the Regional Action Plan. The government has the ability to create and enforce regulations, if necessary, as well as provide financial support for the effort. The U.S. military plays the largest Federal role in the Attaboy Creek Region of Concern, including the presence of the largest U.S. Naval shipyard. The U.S. Army Corps of Engineers, U.S. Coast Guard, and U.S. Fish and Wildlife Service also have large roles in the Attaboy Creek Region.
<b>State government</b>	State government is important in both the planning and implementation phases of the Regional Action Plan. It has the primary responsibility for developing the Regional Action Plan and also has the authority and financial resources to facilitate implementation.
<b>Fisheries</b>	The fisheries and fishery industries have been the group most severely affected by the chemical contamination problem in the Attaboy Creek Region of Concern. The stress put on the fish populations has been excessive, and it is the most obvious indicator of the problems existing.
<b>Land owners/home owners</b>	Land owners and home owners are financially, physically, and aesthetically affected by the health of Attaboy Creek. They also may be affected by proposed actions to protect the river.
<b>Local government</b>	The local government represents individuals living in proximity to Attaboy Creek. The government has control over zoning regulations and other potential actions. There are four cities and two counties in the Attaboy Creek Region of Concern.
<b>Recreational/tourism</b>	Attaboy Creek is attempting to develop a tourism industry that would greatly benefit from the restoration of Attaboy Creek. Recreational users (i.e., pleasure boaters, sport fisherman, and swimmers) would also benefit from cleaner and healthier waters.
<b>Scientists/educators</b>	Faculty from area colleges and universities may have knowledge and information that would be useful in the development of the Regional Action Plan. They can also assure that decisions are being based on accurate data.

Exhibit 3-6. Overview of Potential Stakeholders Within the Chesapeake Bay Watershed

Potential Problem	US EPA Region II	USEPA CBPO	DoD (including Army, Navy, etc.)	USFWS Chesapeake Bay Field Office	USFWS Patuxent Wildlife Research Center	USGS Water Resources Division	National Park Service	National Biological Survey	USCG (info about spills, shipping)	USDA Forest Service	USDA Agricultural Research Service	NOAA National Conservation Service	NOAA National Marine Fisheries Service	USFDA	Army Corps of Engineers	Federal Land Owners
Fishkills	•	•	•	•				•			•	•	•		•	
Finfish/shellfish tissue contamination	•	•	•	•				•			•	•	•		•	
Finfish tumors	•	•	•	•							•	•	•		•	
Restrictions on shellfish harvesting	•	•	•	•				•			•	•	•		•	
Degradation of benthic community	•	•	•	•		•	•				•		•		•	
Water column toxicity	•	•	•		•			•			•	•			•	
Sediment toxicity	•	•	•		•			•			•	•			•	
Restrictions on fish and wildlife consumption	•	•	•	•				•			•	•	•		•	
Degradation of fish and wildlife populations	•	•	•	•	•	•	•	•			•	•			•	
Degradation of phytoplankton/zooplankton populations	•	•	•	•	•		•	•			•	•			•	
Bird and/or animal deformities or reproductive problems	•	•	•	•	•		•	•			•	•			•	
Tainting of fish and wildlife flavor	•	•	•	•		•	•				•	•	•			
Loss of fish and wildlife habitat	•	•	•	•		•	•	•	•		•	•			•	
Restrictions on drinking water consumption	•	•										•				
Restrictions on dredging activities	•	•	•					•							•	
Sediment contamination	•	•	•		•			•			•	•			•	
Water column contamination	•	•	•		•			•			•	•			•	
Groundwater contamination	•	•	•		•						•	•			•	
Added costs to agricultural/industrial water use consumption	•	•							•	•						
Beach closings	•	•	•		•											
Aesthetics degradation	•	•	•		•										•	
Sediment transport/erosion	•	•	•		•	•		•	•	•					•	
Stormwater runoff/Combined Sewer Overflows	•	•	•		•				•						•	
Urban runoff	•	•	•		•			•		•					•	
Agricultural runoff	•	•		•				•	•	•					•	
Atmospheric deposition of contaminants	•	•	•		•	•				•					•	
Industrial discharges exhibiting acute/chronic toxicity	•	•	•												•	
Municipal discharges exhibiting acute/chronic toxicity	•	•														
Superfund sites	•	•	•												•	
Hazardous waste transfer/storage facility	•	•	•												•	

Exhibit 3-6. Overview of Potential Stakeholders Within the Chesapeake Bay Watershed

Potential Problem	State Stakeholder Groups								Local Stakeholder Groups										
	State Environmental Regulation Agency	State Resource Protection Agency	Public Works Administration	State Department of Agriculture	State Dept. of Conservation (Land & Water)	State Water Quality Control Board/Comm.	State Comm. on Fisheries (Inland) & Game	Port Authority	County Planning Office	County Environmental Services	Public Works	Soil and Water Conservation Districts	CBP'S Local Govts. Advisory Committee	Interstate Comm. on the Potomac River Basin	Metro. Wash. Council of Govt	Regional Fisheries or Watershed Comm.	Harbor Master	Local Water Quality Resource Board	County Associations
Fishkills	•	•			•	•	•		•			•			•		•		
Finfish/shellfish tissue contamination	•	•			•	•	•		•			•	•		•		•		
Finfish tumors	•	•										•					•		
Restrictions on shellfish harvesting	•	•			•	•	•		•			•			•		•		
Degradation of benthic community	•	•										•	•				•		
Water column toxicity	•	•		•	•				•		•	•	•	•			•		
Sediment toxicity	•				•			•	•			•	•	•			•		
Restrictions on fish and wildlife consumption	•	•				•	•					•	•				•		
Degradation of fish and wildlife populations	•	•				•	•					•	•	•					
Degradation of phytoplankton/zooplankton populations	•	•										•	•	•					
Bird and/or animal deformities or reproductive problems	•	•		•		•	•					•							
Tainting of fish and wildlife flavor	•	•				•	•					•	•						
Loss of fish and wildlife habitat	•	•		•		•	•		•			•	•	•			•	•	
Restrictions on drinking water consumption	•		•	•					•	•		•	•				•		
Restrictions on dredging activities	•		•		•		•	•	•	•		•			•	•	•		
Sediment contamination	•	•			•			•				•	•	•		•	•		
Water column contamination	•	•		•	•				•		•	•	•	•			•		
Groundwater contamination	•	•		•	•				•		•	•	•	•			•		
Added costs to agricultural/industrial water use consumption	•		•	•	•				•	•	•	•	•				•	•	
Beach closings	•								•	•	•						•	•	
Aesthetics degradation	•								•	•	•	•	•				•	•	
Sediment transport/erosion	•	•		•	•			•	•	•	•	•	•				•	•	
Stormwater runoff/Combined Sewer Overflows	•		•						•	•	•	•	•				•	•	
Urban runoff	•		•		•				•	•	•	•	•				•	•	
Agricultural runoff	•			•	•				•		•	•	•				•	•	
Atmospheric deposition of contaminants	•								•			•	•					•	
Industrial discharges exhibiting acute/chronic toxicity	•					•					•	•	•				•	•	
Municipal discharges exhibiting acute/chronic toxicity	•	•				•			•		•	•	•				•		
Superfund sites	•																		

Exhibit 3-6. Overview of Potential Stakeholders Within the Chesapeake Bay Watershed

Potential Problem	Citizen/Youth General Stakeholder Groups	Chesapeake Bay Commission	Alliance for the Chesapeake Bay	Chesapeake Bay Foundation	CBP's Citizens Advisory Committee (standing)	Property Owners Association (residents)	Sierra Club	Local Ducks Unlimited	Local Audubon Chapter	Local Save Our Streams Chapter	Private/Comm./Industrial Stakeholders	Chambers of Commerce	Local Waterman's Association	Trade and/or Business Association	Industrial Groups/Councils	Property Owners (Industrial Right to Buy)	Academic Stakeholder Groups General	University Sea Grant Programs	University Water Resources Centers	Chesapeake Research Consortium
Fishkills	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Finfish/shellfish tissue contamination	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Finfish tumors	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Restrictions on shellfish harvesting	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Degradation of benthic community	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Water column toxicity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sediment toxicity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Restrictions on fish and wildlife consumption	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Degradation of fish and wildlife populations	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Degradation of phytoplankton/zooplankton populations	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bird and/or animal deformities or reproductive problems	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Tainting of fish and wildlife flavor	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Loss of fish and wildlife habitat	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Restrictions on drinking water consumption	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Restrictions on dredging activities	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sediment contamination	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Water column contamination	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Groundwater contamination	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Added costs to agricultural/industrial water use consumption	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Beach closings	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Aesthetics degradation	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sediment transport/erosion	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stormwater runoff/Combined Sewer Overflows	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Urban runoff	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Agricultural runoff	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Atmospheric deposition of contaminants	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Industrial discharges exhibiting acute/chronic toxicity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Municipal discharges exhibiting acute/chronic toxicity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Superfund sites	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hazardous waste transfer/storage facility	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

potential stakeholders. Interviewing key stakeholders or community leaders for recommendations is another way to identify stakeholders.

### **3.1.3 Identifying Regional Action Team Leaders**

It is critical to identify and cultivate leaders for a Regional Action Team. The most important role for the team leaders is to work with the lead agency and its partner or designee to determine an overall approach for the regional action planning process, including defining roles and responsibilities for the Regional Action Team and establishing a schedule for completing each step of the process. It is essential that the team leaders understand the goals and objectives of the regional action planning process and are able to convey them to the Regional Action Team. The team leaders are also responsible for running Regional Action Team meetings (e.g., ensuring the meeting agenda is followed and topics are covered in a timely fashion), although they may be supported by other parties (e.g., professional facilitator, lead agency.)

In a consensus-based process, like that envisioned for regional action planning, team leaders should orchestrate, but not dictate, the process. Leaders contribute to the process by providing ideas and information, offering approaches for continued progress, ensuring that the process stays on track and encouraging enthusiastic participation and commitment. They should enjoy respect from the other team members and not show bias when leading meetings, regardless of the interests they represent. In some cases, if the team leader is qualified, he or she may also facilitate the decision-making and/or consensus-building, portions of Regional Action Team meeting. However, if a leader wants to negotiate or otherwise represent his or her interests, then facilitation responsibilities should be given to another team member or outside facilitator.

Leaders for the Regional Action Team can be provided by the lead agency, selected from the Team's membership, or obtained from an outside source. They all should be required to commit substantial time to the process and be enthusiastic about their commitment. Exhibit 3-7 summarizes additional qualities of the team leaders.

To remove any perceptions of bias and to provide objectivity to the planning process, it may be advantageous to use a professional facilitator for the decision-making and/or consensus-building portions of Regional Action Team Meetings (e.g., developing evaluation criteria to select implementation actions). Although some stakeholders may object to a facilitator because of concerns that a facilitator may inhibit team members (e.g., in terms of influencing the process or applying their own leadership skills),

**Exhibit 3-7. Team Leader Qualities**

- Is a significant stakeholder, but able to remain objective
- Is committed to a consensus-based process, not an autocratic one; is not overly directive in the effort to reach agreement
- Makes time commitment to plan process and goals
- Is organized and energetic to help maintain momentum
- Contributes expertise and skills
- Offers leadership
- Has experience managing and facilitating meetings
- Is willing to contribute resources of organization (may not be possible for each member)

experienced facilitators, involve team members in leading and managing the process. For example, a professional facilitator can periodically assign facilitation responsibilities to a team member. This may give the facilitator a chance to evaluate the approach taken to date and plan the next step in the process.

The facilitator should have experience in applying a consensus-based approach to solving environmental problems. Although specific knowledge of the technical issues regarding watershed restoration is not necessary, the facilitator or facilitation team can also contribute to the process by providing briefings on background information, such as concept papers or fact sheets, and organizing meeting notes. If a team does not have access to a professional facilitator, a facilitator could be chosen from the team or provided by the lead agency. The ideal candidate has leadership abilities, experience successfully facilitating similar meetings, and an understanding of the regional action planning process. If a non-professional facilitator is used (e.g., someone is appointed from the team), it is recommended that the facilitator and as many team members as possible attend a training workshop on consensus-based decision-making. This training should be sponsored by the lead agency.

**3.1.4 Obtaining Management Support**

The goal of any regional action planning effort is to develop an implementable plan that will effectively reduce and prevent problems associated with chemical contamination in a designated Region of Concern. To be successful in meeting this overall goal, a plan must have a committed management and staff. Individuals believing in the concepts of regional action planning and the proposed implementation approach must exist at all levels, from top management to the staff person(s) who are ultimately responsible for implementing the plan recommendations. The lead agency must provide this level of commitment because it is responsible for initiating the regional action planning process, ensuring

development of the plan, and providing long-term oversight of the implementation actions. Committed management can ensure continued involvement throughout the regional action planning process by directing staff and financial resources; obviously, interest and commitment from the highest levels of management can have the greatest impact. Ideally, the senior agency official responsible for the Regional Action Plan should attend the initial meeting to explain the purpose and importance of the regional action planning activity, the role of the Regional Action Team, and the commitment of the lead agency. Better yet, demonstrated support from elected officials will lend credibility to the process. Team members will be more likely to commit to the planning process if they know that it has the support and commitment from the lead agency's management and/or elected officials. This type of high-level support will lend credibility to the planning process; give team members a heightened sense of purpose that their efforts are important, needed, and will be considered; and may foster greater involvement and cooperation from team members.

Because proposed implementation actions are likely to involve multiple groups (government agencies, affected parties such as industry), management and staff support and commitment from these groups are also critical. Another key role of the lead agency, supplemented by the Regional Action Team, is to provide education and outreach to these groups to ensure that they have a clear understanding of the overall goals of the Regional Action Plan and their roles and responsibilities in implementing proposed actions. The groups should be trained in the importance of the regional action planning process and the implementation actions to which they are charged.

#### **Importance of Government Commitment**

Remedial action planning in the Great Lakes' Ashtabula River, Ohio, benefited greatly from demonstrated support from top level agency management and elected officials. After years of perceived inaction addressing severe environmental problems, demonstrated by the lack of actual cleanup actions, the public greeted the first public meeting of the remedial action planning process with cynicism. However, Ohio EPA continued to stress the importance of public involvement at all stages of the planning process. As well, Ohio EPA and Ohio State Senator Robert Boggs invited community members to a meeting to discuss environmental problems of the Ashtabula Area of Concern, the remedial action planning guidelines, and its plan to establish local input at the early stages. The involvement of the well-respected local government official, plus the demonstrated commitment of Ohio EPA, influenced the eventual active participation of many local citizens and community leaders (Letterhos 1992).

In a geographically based approach to chemical contamination prevention and reduction such as that envisioned for Regions of Concern, many different actions, focused on a variety of pollutant types and sources, often occur simultaneously. To ensure smooth, consistent implementation of the plan, it is helpful to have an enthusiastic plan coordinator. The Regional Action Plan coordinator should be



affiliated with the group responsible for writing the final plan and delivering it to the Executive Council (generally this group is the lead agency). An ideal coordinator will be an enthusiastic, organized, and knowledgeable community member, who has the authority to make the recommended changes and who is provided the financial and technical resources to complete his or her job.

### **3.2 OVERVIEW OF THE REGIONAL ACTION TEAM'S INVOLVEMENT**

As described in Section 3.1, the type and level of the Regional Action Team's involvement in the regional action planning process will vary depending on the planning approach selected by the lead agency. If the lead agency chooses to maintain full responsibility for plan development, then the Regional Action Team's role is somewhat limited to reviewing and commenting on material prepared by the lead agency. On the other hand, the lead agency may delegate all authority for plan development to the Regional Action Team. In this scenario, the Regional Action Team is responsible for assembling and evaluating background materials and developing draft chapters of and recommendations for the plan.

The Chesapeake Bay Program recommends an approach of shared responsibility between the lead agency and the Regional Action Team. This type of approach, involving participation of both parties, is successful because it draws upon the technical and financial resources of the lead agency, while still involving stakeholders in decision-making and consensus-building so that buy-in and commitment to the plan is achieved. One way to implement this approach of shared responsibility is to have the lead agency develop relevant background materials and options papers to be used as the foundation for a facilitated consensus-building process involving the Regional Action Team. Background papers provide an overview of the issue, while options papers suggest choices of language for the plan and/or plan recommendations (e.g., implementation actions). Section 3.5 of this chapter describes this process in more detail.

It is essential for the Lead Agency and the Regional Action Team to decide early in the planning process how they want to approach development of the Regional Action Plan, including defining appropriate roles and responsibilities for each step of the process. The approach should be mutually decided and understood by all parties in order for the planning process to proceed effectively. Recognizing that the exact approach to conducting the regional action planning process will be unique to each Region of Concern, the Regional Action Team should be involved in the development of the Regional Action Plan at least to the following extent:

- Evaluating background materials
- Providing expertise and input for the plan (e.g., technical materials, recommendations for additional sources of material and contacts)

- Supporting the decision-making process required for effective plan development.

The Regional Action Team's most important role is that of participating in the decision-making process. As discussed throughout this guidance document, the regional action planning process, and final plan, must be streamlined and focused on priority issues so that limited resources are effectively used. Therefore, many of the steps needed to complete the plan involve decision-making about priorities (e.g., What are the most important adverse ambient effects? What chemical contaminant types and sources are the greatest concern? What implementation actions should be pursued first?). The Regional Action Team should be involved in all decision-making aspects of the plan. In fact, many of tasks toward developing the Regional Action Plan should be accomplished in a consensus-building framework, where the affected parties (stakeholders) are represented by the Regional Action Team.

The remainder of this section further describes the anticipated involvement of the Regional Action Team in the planning process. The information is presented in the following subsections:

- Identifying stakeholder interests
- Evaluating environmental problems and establishing goals and objectives
- Evaluating existing management programs
- Determining implementation actions.

### 3.2.1 Identifying Stakeholder Interests

The interests of stakeholders participating on the Regional Action Team should be identified as soon as possible, perhaps as early as the initial team meeting. The information gained in this process will help team members understand each other's motivations, as well as the interests that lie behind any positions that might be taken in the planning process. This information can foster an open and honest dialogue.

It is important that team members not judge or evaluate interests—every interest represented by a stakeholder should be welcomed and recorded. The interests generally pertain to human health and the environment, as well as to economic and social issues. The team should make every effort to represent non-human environmental interests.

**Positions** represent a group's or individual's stand or decision about an issue, whereas **interests** are the underlying concerns that helped form the position. For example, a group's position could be that they want to ban new industries from being allowed to directly discharge to a Region of Concern, while their interest is restoring a viable recreational fishery (Fisher and Ury 1991).

Planning processes can deteriorate at this early stage because people may try to alter or question other stakeholder interests or because they do not have the patience to spend a few hours or a day identifying and understanding interests. If the team moves through this step efficiently, however, participants will have valuable information for later in the process. When negotiating recommendations, for example, it is necessary to consider the relationship between a stakeholder's position and his or her interests. If the position a stakeholder chooses threatens team consensus, team members should consider whether the position is consistent or inconsistent with the stakeholder's interests. If it is inconsistent, team members should ask the stakeholder to consider whether his or her interests can be satisfied in a different way. For example, if a stakeholder's position is that it is necessary to ban new industries from directly discharging to the Region of Concern but their interest is in restoring a recreational fishery, perhaps the interest could be achieved through a means other than a ban (e.g., modification of existing NPDES permit limits to be more stringent). This kind of situation underscores the importance of understanding stakeholder interests early in the process.

During each Regional Action Team meeting, information such as stakeholder interests, common interests, and conflicting interests, as well as the agenda for the next meeting, should be recorded on flip charts and distributed as notes between meetings.

### **3.2.2 Evaluating Environmental Problems and Establishing a Vision Statement, Goals and Objectives**

The early stages of the regional action planning process should focus additional investigations on priority problems. An effective Regional Action Plan will be streamlined and targeted on the primary sources of chemical contamination identified as contributing to priority problems. In order to prioritize problems for

During this initial problem identification stage, the team and lead agency could sponsor activities to educate and seek input from the public at large on the nature and scope of the identified problems. These activities should include public workshops, roundtable discussions, and citizen surveys, such as mail or telephone surveys to assess the public's awareness and perceptions of the issues involved.

action, the Regional Action Team must have a sense of the vision, goals, and objectives it hopes to achieve in the Region of Concern. The process of identifying and prioritizing problems, including sources, and determining a vision statement, goals, and objectives is iterative—as the Regional Action Team develops its information base on problems, goals and objectives might become apparent. Likewise, achievement of goals and objectives might clearly require focus on specific problems and chemical sources.

The Regional Action Team should be involved in all phases of the decision-making processes to identify and prioritize problems, including chemical contaminant types and contributing sources. The team is also integral in establishing the plan's vision statement, goals, and objectives. The results of this process will not only guide plan development, but will provide much of the written portion of the final plan. Early consensus by the team on these topics can be developed from a general understanding of the problem (i.e., why the area was designated as a Region of Concern), supported by readily available information, including written materials (e.g., newspaper articles, research documents, and other technical reports), consultation with individuals familiar with the Region of Concern, and materials acquired and generated by the Chesapeake Bay Program when identifying the particular Region of Concern. This base level of information will provide the necessary background needed to stimulate the team to further characterize the problem and begin establishing goals. In addition to participating in the decision-making, the team is expected to evaluate materials and provide technical support, as necessary. Chapters 4 and 5 of this guidance document provide more detailed information on establishing the plan's vision statement, goals, and objectives (Chapter 4) and evaluating environmental problems (Chapter 5).

### **3.2.3 Evaluating Existing Management Programs**

The most successful actions to reduce the impacts of chemical contamination in Regions of Concern are often developed by evaluating and modifying existing approaches. Therefore, the thorough evaluation of existing management programs, including regulatory and nonregulatory approaches (e.g., NPDES permit compliance, pollution prevention) is an important and essential prerequisite for developing an implementation approach. The Regional Action Team should play an integral role in identifying and evaluating existing management programs.

Chapter 6 of this guidance defines an approach for evaluating existing management programs. The lead agency would likely spearhead these evaluations, supported by Regional Action Team members. The investigations must include an assessment of regulatory and nonregulatory approaches and activities taken by government agencies and non-governmental organizations. A well-selected Regional Action Team could provide the majority of information needed for these investigations. It is expected that Regional Action Team members representing different stakeholder groups (e.g., government, industry, environmental organizations) could report on key programs and/or provide a list of additional contacts for consultation. The Regional Action Team would also determine the criteria to guide the evaluation (i.e., the basis for measuring effectiveness). Once the evaluation is complete, the Regional Action Team would review the results, determine if additional investigations were needed, and consider which existing management measures should be considered as potential implementation actions.

**3.2.4 Determining Implementation Actions**

The ultimate effectiveness of a Regional Action Plan hinges on developing effective implementation actions. Chapter 7 of this guidance outlines a procedure to identify and select implementation actions. The Regional Action Team plays a critical role in determining these actions. Because of their importance in determining overall plan effectiveness, it is essential that sufficient time be allocated to identify, research, and rank potential implementation actions; generally, the Regional Action Team needs at least 2 full meeting days to evaluate and select implementation actions.

Although the lead agency may assemble the background materials needed to evaluate potential actions, the Regional Action Team will be involved in most steps of the process—brainstorming about potential actions, providing background information, volunteering to conduct additional research if needed, and developing criteria to evaluate the suitability of actions.

One of the first steps involves developing an organized inventory of potential implementation actions. The facilitator/team leader should first poll the team on suggested approaches for organizing actions. To do this, it may be appropriate for the team to review the purpose of the Regional Action Plan and to structure the actions accordingly (e.g., by pollution source category).

Once the team identifies a loose structure for the implementation actions, team members should "brainstorm" to identify actions within each category (e.g., point source actions, nonpoint source actions, actions directed at urban areas, actions directed at marinas). The team should develop as many actions as possible without judging them. When developing actions, it is important for the team to be innovative and creative in attempting to address stakeholder interests. In addition, it is important to carefully evaluate existing management approaches in the Region of Concern, as well as proposing new ones. It is especially important to consider existing laws and policies; a priority of the planning process should be to evaluate compliance and enforcement effectiveness. The team should also identify gaps in existing laws, programs, and policies so that effective new solutions can be developed.

After developing a list of potential implementation actions (this may take a few meetings), the Regional Action Team must further refine and organize these options. The team may want to establish specific criteria, such as technical feasibility, cost, financing, and public acceptability, to determine whether an action is appropriate and, therefore, a candidate for further evaluation (see Chapter 7). The Regional Action Team should work closely with the lead agency to identify evaluation criteria. These criteria must be well understood by all team members. Although each Regional Action Team may

develop its own evaluation criteria, it is important that the selected criteria enable the team to narrow its comprehensive list of potential actions to a manageable size for further consideration.

Regional Action Team members or subgroups/workgroups of the Regional Action Team, working with the lead agency, can be charged with further evaluating and defining promising actions between team meetings. Meetings will be more productive and time efficient if the team members have this background information prior to the meetings.

During this phase, the Regional Action Team should also evaluate implementation actions with respect to identified stakeholder interests. The team should try to move toward the action that best meets its diverse interests, reminding stakeholders that the option is probably better than the alternatives that would result if an agreement could not be reached.

Strong leadership is essential to timely and complete closure on an issue. Closure entails a full and accurate transcription of recommendations and commitments, as well as assurance that each commitment can be fulfilled. Recommendations should be as thorough as possible and should be related to specific evaluation criteria. The Regional Action Team should work with the lead agency and other responsible groups to ensure that final implementation actions are fully described and address the following questions:

- Who is responsible for implementation?
- What actions are necessary to implement the plan?
- Where should the implementation activities be targeted?
- When should actions be taken?
- How should actions be implemented?

The team should organize its final recommendations into the format of the Regional Action Plan. The lead agency (and responsible agencies, if possible) should be prepared to assist the team in compiling the plan. The draft plan, including implementation actions, should be made available to the team for review and comment before submittal to the general public and any governing agency (e.g., Chesapeake Executive Council) for review, comment, and adoption.

### **3.3 DEVELOPING A WORK PLAN**

It is important that the approach to regional action planning and consensus-building be established near the beginning of the planning process, ideally before the first meeting of the Regional Action Team, so that it can be thoroughly described to all participants in the planning process. In addition, the roles and responsibilities of the lead agency, team leaders, team members, and other participants (e.g., a facilitator) should be clarified.

Frequently, planning activities, including stakeholder meetings to build consensus, suffer from a lack of focus and an unspecified game plan. A perception of disorganization and a lack of clearly defined goals and objectives can severely hurt the regional action planning process and the development of an implementable plan. In the early stages of the regional action planning process, it is important to clarify the overall purpose of the planning activities, identify an approach to the planning process, determine a schedule and planning milestones, and define the roles and responsibilities of participants. The lead agency, in conjunction with an existing stakeholder group (if applicable, should the lead agency choose to delegate some or all of its authority to such a group), and Regional Action Team leaders, may want to draft a work plan to guide the planning process. At a minimum, the work plan should:

- Provide an overview of the approach that will be used to conduct the planning process (e.g., use of a professional facilitator, methods used to make decisions and build consensus)
- Identify roles and responsibilities for the planning process
- Outline potential meeting agendas, including anticipated decision points, for the Regional Action Team
- Present a schedule for planning activities (e.g., proposed meetings, draft materials, and plan completion).

A work plan provides the basis, or road map, for the regional action planning process. It ensures that all participants understand the anticipated process from the beginning, and contains a schedule to keep the process moving in a timely manner. The work plan is intended to serve as a guide only—it is not cast in stone, and should be reviewed throughout the process and revised as necessary. Exhibit 3-8 highlights selected activities that should occur during the development of the Regional Action Plan and should be addressed in the work plan. These activities are tied to hypothetical Regional Action Team meetings. The exhibit presents information on proposed agendas for each meeting, as well as suggestions for background materials needed to prepare the Regional Action Team for the meeting and suggestions for products/outcomes to be generated from the meetings. This information is presented as guidance and

**Exhibit 3-8. Overview of Activities Comprising the Regional Action Planning Process**

Meeting #1
<b>Materials Distributed in Advance</b>
<ul style="list-style-type: none"> <li>• Agenda</li> <li>• List of team members</li> <li>• Background materials (summary materials describing planning process, Region of Concern; draft work plan; fact sheet summarizing existing information on problems; draft language on vision statement, preliminary goals and objectives)</li> </ul>
<b>Suggested Agenda Topics [Responsible Party]</b>
<ul style="list-style-type: none"> <li>• Welcome [Lead Agency]</li> <li>• Introductions, including statement of participant's interests, and personal goals and objectives for the process [Team Leaders]</li> <li>• Background Presentations <ul style="list-style-type: none"> <li>- Overview of the Planning Process [Lead Agency]</li> <li>- Roles and Responsibilities [Lead Agency, Team Leaders]</li> <li>- Preliminary assessment of problems [Lead Agency, Invited Speakers]</li> <li>- Overview of existing activities, including assessment of current actions by representative stakeholders (e.g., success stories) [Lead Agency, Invited Speakers]</li> <li>- Meeting ground rules [Lead Agency, Facilitator]</li> </ul> </li> <li>• Present work plan and describe approach for Regional Action Team. [Lead Agency, Team Leaders] <ul style="list-style-type: none"> <li>- Procedures (e.g., use of a facilitator; development of background papers)</li> <li>- Roles and responsibilities</li> <li>- Desired final product</li> <li>- Anticipated schedule</li> </ul> </li> <li>• Seek agreement on work plan and team approach. [Lead Agency, Team Leaders]</li> <li>• Discuss need for public participation. Seek volunteers to develop public participation strategy. [Lead Agency, Team Leaders]</li> <li>• Review presentations and other existing background information on problems with goal of beginning prioritization. If materials are distributed in advance of meeting (at least one week), it may be appropriate for group to reach facilitated consensus on problem statement and prioritization of problems for consideration. If advance distribution is not possible, use meeting to introduce materials and prepare Regional Action Team for next meeting. [Team Leaders, Facilitator]</li> <li>• Present draft language on vision statement, preliminary goals, and objectives. If distributed in advance of meeting (at least 1 week), it may be appropriate for group to reach facilitated consensus on preliminary goals and objectives. If advance distribution is not possible, use meeting to introduce materials and prepare Regional Action Team for next meeting. [Team Leaders, Facilitator]</li> </ul>
<b>Products To Be Generated From Meeting</b>
<ul style="list-style-type: none"> <li>• Problem definition and prioritization (if materials distributed in advance and adequate time allowed to discuss)</li> <li>• Vision statement, preliminary goals and objectives (if materials distributed in advance and adequate time allowed to discuss)</li> <li>• Summary of participants interests and desired outcomes</li> <li>• Finalized work plan</li> <li>• Meeting evaluation</li> </ul>



### Exhibit 3-8. Overview of Activities Comprising the Regional Action Planning Process (continued)

Meeting #2
<p><b>Materials Distributed in Advance</b></p> <ul style="list-style-type: none"> <li>• Agenda</li> <li>• Meeting highlights</li> <li>• Background materials (background reports on sources of problems, existing management approaches)</li> </ul> <p><b>Suggested Agenda Topics</b></p> <ul style="list-style-type: none"> <li>• Conclude unfinished business from previous meetings. [Team Leaders]</li> <li>• Seek consensus on problem definition and prioritization. [Facilitator]</li> <li>• Seek consensus on preliminary goals and objectives. [Facilitator]</li> <li>• Present more detailed problem definition, including chemicals of concern and sources of concern. Present evidence, to date, linking sources to problems. If evidence is sufficient, and/or if team has had time to review materials, begin to prioritize sources for action. Develop criteria for identifying priority sources.<sup>1</sup> [Team Leaders, Lead Agency, Facilitator, Invited Speakers]</li> <li>• Present results of evaluation of existing management measures. [Team Leaders, Lead Agency, Facilitator, Invited Speakers]</li> </ul> <p><b>Products To Be Generated from Meeting:</b></p> <ul style="list-style-type: none"> <li>• Products that must be completed from first meeting: <ul style="list-style-type: none"> <li>- Final problem definition and prioritization</li> <li>- Vision statement, preliminary goals and objectives</li> </ul> </li> <li>• Preliminary ranking of priority source categories.</li> <li>• List of action items for next meeting.</li> <li>• Meeting evaluation.</li> </ul>
Meeting #3
<p><b>Materials Distributed in Advance</b></p> <ul style="list-style-type: none"> <li>• Agenda</li> <li>• Meeting Highlights</li> <li>• Background materials (final report summarizing sources of chemical contamination; preliminary list of implementation actions based on preliminary ranking of source categories).</li> </ul> <p><b>Suggested Agenda Topics</b></p> <ul style="list-style-type: none"> <li>• Conclude unfinished business from previous meetings. [Team Leaders]</li> <li>• Present additional information linking sources of chemical contamination to priority problems. Discuss sources of chemical contamination. Develop final ranking of sources based on evaluation criteria. [Team Leaders, Lead Agency, Invited Speakers, Facilitator]</li> <li>• Evaluate preliminary goals and objectives. Modify as needed to reflect new information. [Facilitator, Team Leaders]</li> </ul>

<sup>1</sup>It is important to remember that the Regional Action Plan's ultimate goal is to present an implementation approach for addressing problems caused by chemical contamination in a designated Region of Concern. The analyses conducted for the planning process should always bear this goal in mind so that limited resources can be utilized effectively. It is useful to streamline the planning approach by focusing on priority problems and sources of problems. Once priority problems and sources are identified, further investigations should be focused on those areas.

### Exhibit 3-8. Overview of Activities Comprising the Regional Action Planning Process (continued)

Meeting #3 (continued)
<ul style="list-style-type: none"> <li>Review work plan. Determine if work plan needs to be modified. [Facilitator, Team Leaders]</li> <li>Report of approach and results for identifying implementation actions.<sup>2</sup> [Lead Agency, Team Leaders, Invited Speakers]</li> </ul> <p><i>Products to Be Generated from Meeting</i></p> <ul style="list-style-type: none"> <li>Final ranking of priority source categories</li> <li>List of action items for next meeting</li> <li>Meeting evaluation.</li> </ul>
Meeting #4
<p><i>Materials Distributed in Advance</i></p> <ul style="list-style-type: none"> <li>Agenda</li> <li>Meeting highlights</li> <li>Background materials (reports presenting comprehensive list of implementation actions by source category, including qualitative information needed to evaluate and prioritize actions)</li> </ul> <p><i>Suggested Agenda Topics</i></p> <ul style="list-style-type: none"> <li>Conclude unfinished business from previous meetings. [Team Leaders]</li> <li>Present research on implementation actions. [Lead Agency, Team Leaders, Invited Speakers]</li> <li>Select implementation actions to be pursued further. [Lead Agency, Team Leaders, Invited Speakers]</li> </ul> <p><i>Products To Be Generated from Meeting</i></p> <ul style="list-style-type: none"> <li>Short list of implementation actions to be evaluated in more detail.</li> <li>Meeting evaluation</li> </ul>
Meeting #5
<p><i>Materials Distributed in Advance</i></p> <ul style="list-style-type: none"> <li>Agenda</li> <li>Meeting Highlights</li> <li>Background materials (final report on implementation actions, outline and materials prepared to date for final plan)</li> </ul> <p><i>Suggested Agenda Topics</i></p> <ul style="list-style-type: none"> <li>Conclude unfinished business from previous meetings. [Team Leaders]</li> <li>Review status of implementation actions. Seek implementation commitments. [Team Leaders, Invited Speakers, Facilitators]</li> <li>Discuss presentation of final plan (it is appropriate throughout the planning process for the lead agency and/or a drafting subcommittee from the Regional Action Team to prepare draft chapters of the plan for distribution, review, and comment). [Team Leaders, Lead Agency]</li> <li>Determine schedule for additional meetings, if necessary. [Team Leaders]</li> </ul> <p><i>Products to Be Generated from Meeting</i></p> <ul style="list-style-type: none"> <li>Approach, including assigned responsibilities, for preparing final plan and securing commitments for implementation actions.</li> <li>List of remaining action items and next steps.</li> <li>Meeting evaluation.</li> </ul>

<sup>2</sup>When developing implementation actions, it is important to focus on priority problems and sources. Also, the level of detail needed in the assessment should be limited to that required for sound decision-making (e.g., a qualitative analysis may be all that is needed for the purpose of narrowing list of potential implementation actions to those that should be pursued in more detail for the final plan). Excess analysis should be avoided.

should be modified to suit the unique needs of the Region of Concern. As discussed in more detail in Section 3.4, it is important to set aside sufficient time during the meetings to adequately cover each agenda topic.

### **3.4 CONDUCTING EFFECTIVE REGIONAL ACTION TEAM MEETINGS**

Successful regional action planning depends largely on effective stakeholder involvement so that parties affected by and contributing to chemical contamination problems in the Region of Concern feel an important part of the process, gain a sense of ownership to the plan, and commit to the proposed implementation actions. Since the Regional Action Team is the main forum for involving stakeholders, it is important to conduct effective Regional Action Team meetings. The efficiency and effectiveness of Regional Action Team meetings depends on an organized approach with clearly defined roles and responsibilities for all participants, a well-planned meeting schedule that accounts for all phases of plan development, and clearly articulated meeting agendas and approaches to developing the plan. Without these elements, the chances of conducting a successful regional action planning process are greatly reduced, as:

- Confusion over roles and responsibilities may result in a duplication of efforts and/or gaps in responsibilities.
- Meetings may lose focus, become rambling discussions, or are side-tracked, so that concrete action items are not developed.
- Participants may become disinterested and discouraged because they feel that they are not accomplishing anything (not a part of the process) or they lose sight of the overall purpose and end goal of the planning process.
- The resulting plan may lack focus and/or may not adequately represent stakeholder groups.

It is important to ensure that the overall meeting schedule, and individual meeting agendas, allow enough time for the consensus-based process to occur. The Regional Action Team must reach consensus on many issues throughout the planning process—vision statement, goals, and objectives; problem definition and prioritization; and implementation action selection. In order for the team to feel a legitimate part of the planning process, it is necessary for them to have time to review background materials, formulate their ideas, and discuss their opinions in a facilitated process. The amount of time needed for these activities varies, depending on the complexity of issues being addressed and the size of the Regional Action Team. In general, a facilitator needs at least 2 to 3 hours per issue (e.g., identifying goals and objectives) to effectively work with the Regional Action Team. The length of each team meeting should

be adjusted to reflect the number of issues being addressed. In many situations, it works well to have the Regional Action Team meeting run from mid-morning to early afternoon (e.g., 10:00 a.m. to 3:00 p.m.), with a break for lunch. This structure enables the morning session to cover background material, gives the team members time to discuss information and formulate opinions during the lunch break, and saves sufficient time for facilitated decision-making in the afternoon. The lead agency and team leaders should work closely with the facilitator to block off appropriate amounts of time for each topic.

The importance of clearly defining meeting roles and responsibilities, in terms of who is responsible for which parts of the meeting and how the meeting will be conducted, cannot be overemphasized. An effective Regional Action Team meeting must have a designated team leader or co-leaders and a balanced and representative group of participants (i.e., team members) representing key stakeholders. In addition, it is recommended that a facilitator conduct portions of the meeting and a meeting recorder provide notetaking and other support for the meeting. The appropriate roles and responsibilities for participants in Regional Action Team meetings (i.e., team leaders, team members, lead agency, facilitator, and recorder) are defined in Exhibit 3-9. The lead agency can remain active in the planning process by providing technical support and/or facilitation expertise, if possible. Frequently, it helps to have an outside facilitator to build trust among all meeting participants, so they do not perceive a hidden agenda. For this reason, it is also advisable that the Regional Action Team leader(s) be someone other than the lead agency. However, the lead agency is a valid stakeholder in the planning process and should appoint a member to the Regional Action Team.

Just as it is important to have clearly defined roles and responsibilities among planning participants, it is also necessary to have clearly articulated meeting agendas and approaches. The lead agency, its partner or designee (e.g., existing groups), team leaders, and the facilitator should work together to develop effective meeting agendas and approaches. Sometimes this process can be guided through the joint development of a work plan to guide the planning process (see Section 3.3). Regional Action Plans are developed from the evaluation of different types of information, as well as substantial input from the Regional Action Team and the general public. To effectively synthesize the information in a timely and efficient fashion and to ensure that all parties are adequately represented requires an organized meeting approach. Without an organized approach, meetings and/or the planning process can get side-tracked, result in time-consuming, unfocused discussions, and potentially not achieve the goals of the planning process.

## Exhibit 3-9. Roles and Responsibilities—Regional Action Team Meetings

<b>Team Leader or Co-Leaders</b>
<ul style="list-style-type: none"> <li>• Establish meeting objectives and plans and are responsible for the overall direction of the meeting</li> <li>• Clarify participants' roles and responsibilities</li> <li>• Start meeting on time</li> <li>• Provide introductions, summarize meeting objectives and agenda items, and define roles and responsibilities</li> <li>• Work with facilitator to ensure meeting agenda is followed in a timely manner</li> <li>• Participate as group members</li> <li>• Summarize key decisions and actions</li> </ul>
<b>Team Members</b>
<ul style="list-style-type: none"> <li>• Generate ideas, analyze information, provide technical input, make decisions, and implement action plans</li> <li>• Review agenda and other meeting materials before attending meetings</li> <li>• Conduct enough pre-meeting background research to participate effectively in the meeting</li> <li>• Know purpose of meeting ahead of time and do "homework" if necessary to prepare</li> <li>• Confirm attendance and delegate an alternate if cannot attend</li> <li>• Attend meeting on time</li> <li>• Keep an open mind, avoid premature judgment, and try to understand other perspectives</li> <li>• Help facilitator eliminate distractions and encourage active involvement</li> <li>• Speak up; share useful ideas</li> <li>• Support ground rules and other meeting guidelines</li> <li>• Participate in a timely fashion</li> <li>• Volunteer for tasks only if capable of following through</li> <li>• Agree to participate in consensus-building exercises</li> </ul>
<b>Lead Agency</b>
<ul style="list-style-type: none"> <li>• Provides technical and financial support</li> <li>• Schedules meetings</li> <li>• Prepares draft agenda</li> <li>• Provides background materials for the meeting</li> <li>• Participates as a team member</li> </ul>
<b>Facilitator</b>
<ul style="list-style-type: none"> <li>• Manages how people work and communicate in the meeting</li> <li>• Is responsible for flow of the meeting</li> <li>• Coordinates with Regional Action Team leaders and lead agency to acquire any needed background or other preparatory information</li> <li>• Reviews planned agenda and action items</li> <li>• Ensures meeting runs smoothly</li> <li>• Reviews team's ground rules</li> <li>• Focuses the group</li> <li>• Monitors and regulates participation</li> <li>• Evaluates effectiveness of process and suggests alternative methods and processes as necessary</li> <li>• Protects people from "attack" and deals with problem people</li> <li>• Remains neutral at all times, particularly during disagreements</li> </ul>
<b>Recorder</b>
<ul style="list-style-type: none"> <li>• Keeps track of important information throughout the meeting, prepares flip charts and other necessary visual aids during the meeting, and prepares post-meeting summaries and action items.</li> <li>• Prepares necessary meeting summaries, highlights, and other materials.</li> <li>• Captures ideas visually without editing or paraphrasing.</li> <li>• Checks to ensure that appropriate information has been recorded; obtains clarification from the participant if needed.</li> <li>• Helps leader and facilitator keep track of information.</li> <li>• Produces meeting summaries, highlights, and other materials.</li> </ul>

Source: Adapted from Chang and Kehoe (1994)

Many references exist that summarize the elements of productive meetings, including preparing the meeting, conducting the meeting, and evaluating the meeting (Chang and Kehoe 1994; Doyle and Straus 1976; Fisher and Ury 1991). Exhibit 3-10 summarizes some basic considerations for conducting effective meetings in the context of regional action planning.

**Exhibit 3-10. Basic Considerations for Conducting Effective Regional Action Team Meetings**

- Determine appropriate participants (e.g., subject matter experts, key decision-makers, and affected parties, not unaffected parties and known meeting "disrupters").
- Ensure continual and balanced representation. Primary team member should select alternate if he/she cannot attend.
- Clearly define and reach agreement on roles and responsibilities for all meeting participants, including meeting leaders, meeting facilitator, recorder, Regional Action Team members, and lead agency. Define and maintain roles and responsibilities from the beginning to end of the process.
- Fully consider each stage of meeting development: (1) Preparing for the meeting, (2) Conducting the meeting, and (3) evaluating the meeting. No stage should be ignored or minimized.
- Develop a well-thought out agenda providing the following information: meeting objectives, logistics, anticipated attendee list (defining leader, facilitator, recorder), roles and responsibilities, action items (i.e., list of items that must be covered to achieve meeting objectives), and allocated time.
- Reach agreement on approach to planning process, including meeting schedules, ground rules, and guidelines.
- Distribute necessary background materials to meeting participants sufficiently in advance of the meeting
- Keep meetings focused on priority issues. When making decisions, develop a variety of options from which to prioritize using a consensus-based set of objective evaluation criteria.
- Allow sufficient time to cover the subject adequately and build consensus, if necessary.
- Avoid getting bogged down in details. Investigations are designed to support the development of sound implementation actions. Detail beyond that needed for the purpose of developing implementation actions may be superfluous.
- Ensure open and balanced participation from all participants.
- Strive toward consensus-based decision-making.
- Produce meeting summaries and progress reports to ensure that the overall planning process remains focused toward its end goal.
- Evaluate the meeting to ensure that participants are satisfied with the approach.

Sources: Chang and Kehoe (1994); Fisher and Ury (1991); Chechile and Carlisle (1991); Doyle and Straus (1976)

### **3.5 APPROACHES TO BUILDING CONSENSUS**

An effective Regional Action Plan will be developed using a consensus-based process involving major stakeholders represented through the Regional Action Team. This type of process, which ensures that all parties are heard and the actions are not dictated, but mutually agreed upon, typically leads to a greater sense of ownership to the plan, commitment to its recommendations, and a better chance that it will last over the long run. There are many techniques that can be used to develop plans based on a consensus-approach, depending on the size of the group involved and the particular situation in the Region of Concern. As mentioned previously, the optimal group size for this type of process is no more than 7 to 15 participants; if more people are needed, it may be necessary to break into smaller subgroups.

In an ideal planning situation, a trained facilitator (especially one having some technical familiarity with the issues facing the Region of Concern) will provide the skills needed to guide the Regional Action Team. If it is not possible for the Regional Action Team to have a professional facilitator, the team leader, or someone from the lead agency, could perform these duties if the team agrees to that approach and the chosen facilitator is able to remain objective. Alternatively, the lead agency may want to offer facilitation training as part of its overall technical assistance to the regional action planning process. Many organizations offer facilitation services and/or training. Regardless of the approach used to obtain a facilitator, care should be taken in the selection process because the facilitator has a great deal of influence on the overall success of the planning process. Selection criteria include experience with similar planning situations, familiarity with a variety of approaches used to build consensus, familiarity with the ground rules and procedures to conduct efficient meetings, enough technical background to have some familiarity with Region of Concern issues, experience working with groups of a similar size and composition, and ability to remain neutral (not representing any interests).

While it is beyond the scope of this document to provide a thorough discussion of the consensus-building approach to decision-making, two key elements are essential (Fisher and Ury 1991; Doyle and Straus 1976):

- Generating a wide variety of possibilities and alternatives before making a decision
- Measuring the possibilities against previously agreed upon, objective evaluation criteria to determine final outcome.

When evaluating candidates for the facilitator's role, it would be useful to ensure they have familiarity with this kind of approach.

Facility-based pollution prevention planning provides one example of using this approach. Typically, the facilities determine at the outset of the planning process the environmental problems or issues of greatest concern. Using those priorities as the basis for further investigations, the facilities identify a broad range of pollution prevention opportunities that will address targeted environmental problems. This broad list of opportunities is then compared against predetermined evaluation criteria (e.g., liability, regulatory compliance, implementation considerations, costs, environmental impacts) to determine final choices (Chechile and Carlisle 1991; Gaunt et al. 1994; SAIC 1993). Chapter 7 and Appendix D of this guidance document provide more information on decision-making using evaluation criteria.

In order to provide effective input to the planning process, participants need to have enough background information to form the basis for sound decision-making. Ideally, Regional Action Team members will have some technical familiarity and understanding of the issues concerning a Region of Concern. The preparation of background materials in advance of planned meetings can also help. An approach that was effective in conducting the Chesapeake Bay Program's Nonpoint Source Evaluation Panel (Chesapeake Bay Program 1990) is briefly summarized below and may be applicable to the regional action planning process:

- **Identify topics for investigation**—Overall purpose of the planning process is defined by Lead Agency and Regional Action Team, and discrete topics needing additional information are identified. For example, the Regional Action Team may want to learn more about the effectiveness of existing management approaches.
- **Prepare background and options papers**—Lead agency (or volunteers from the Regional Action Team) prepares background materials (e.g., short overview papers) on identified topics. In addition, options papers, outlining specific choices the group may want to use as the basis for its decision-making process, may be prepared. For example, the background paper would summarize the effectiveness of existing management programs, while the options paper would make suggestions on ways to modify/improve the existing programs. Suggestions made in the options paper could be included by the Regional Action Team as potential recommendations in the final plan. Background and options papers should be distributed to team members in advance of the planned meeting so they can have time to review the information (e.g., at least 1 week). The background and options papers may also be supplemented by a presentation at the meeting.
- **Facilitate decision-making**—Using the background and options papers as the basis for dialogue at the meeting, a facilitator guides the group through a consensus-building process to reach agreement on choices (e.g., which options paper recommendations to include in the final plan).
- **Prepare plan**—Using the decision-points generated from the options papers, supplemented by additional input, the lead agency, or a subcommittee of the Regional Action Team,



prepares sections of the final plan. Each section, and the completed draft plan, are distributed to the group for review, comment, and approval.

The length of time for this process obviously varies depending on the situation. It is necessary to give team members adequate time to review materials before the scheduled meetings, so drafts should be distributed at least a week in advance. As well, it is important to allocate sufficient time at the meetings to fully discuss issues and reach consensus. It may be necessary to discuss some issues over the course of several meetings. As outlined in Exhibit 3-8, the regional action planning process should plan on at least the following schedule (Note: Schedule assumes meetings will be conducted for most of a day [e.g., 10:00 a.m. to 3:00 p.m.]):

- Defining vision, goals, and preliminary objectives—One early meeting, but to be modified and refined throughout the process
- Developing a problem statement—One meeting
- Reviewing the efficacy of existing measures—Half of a meeting to one meeting. Could be coupled with a preliminary overview of proposed implementation actions.
- Developing implementation actions—At least two meetings.

### **3.6 PUBLIC PARTICIPATION AND EDUCATION**

A public participation and education program should be implemented throughout the regional action planning process. The Regional Action Team, in conjunction with the lead agency, should take responsibility for defining a public participation approach. Because the Regional Action Team may be consumed with developing the Regional Action Plan, a subset of the team, or a new group designated by the Regional Action Team and/or lead agency, should take responsibility for involving the public. In addition, the Regional Action Team should include ongoing public participation and education as an implementation action for the Regional Action Plan.

The public participation and education program recommended for regional action planning is different from, and moves beyond, stakeholder involvement on the Regional Action Team. Although specific segments of the public are represented on the Regional Action Team, the extent and level of public participation envisioned for the regional action planning process is much broader than the representation provided by the Regional Action Team. In addition, the roles and responsibilities of the Regional Action Team are very different than what is needed for public participation and education. The Regional Action Team is a small group tasked with developing a Regional Action Plan, whereas the

public participation and education approach is intended to build support for the Plan's implementation by informing and enthusing the general public about the Region of Concern.

The public includes all citizens who live in the area—those represented by specific stakeholder groups (e.g., Regional Action Team, civic groups, business associations, environmental organizations) and citizens who may not be so represented (e.g., homemakers, subsistence fishers). Some examples of specific sectors of the public that should be included in a public participation and education approach are private businesses, homeowners associations, garden clubs, civic groups, schools and colleges, churches, educational nonprofit organizations, and groups that represent racial and ethnic minorities. The broad involvement of these groups is necessary to ensure successful plan implementation. Only when the public understands and embraces the plan, will they be able to support implementation.

The importance of including the general public cannot be overemphasized. Public involvement is a critical link between plan development and implementation. During this era of severe constraints on both government and private sector funding, recognizing the value of the public as a resource is essential to achieving the goals and objectives of Regional Action Plans. Likewise, public involvement in planning will generate more commitment and volunteerism during implementation. An educated and motivated public can provide much of the expertise, time, effort, and leadership needed to protect and monitor the Region of Concern. Two factors are crucial for encouraging public involvement: (1) education about the Region of Concern, including how the individual is a part of the problem and solution, and (2) inclusion in the planning process, even if it is just to be kept informed. People work for that which they understand and are committed, and people are committed to that which they help create. The public's talents, energy, and technical and financial resources can be a cost-effective way of solving many of the Region of Concern's problems.

One of the cornerstones of successful action planning efforts is the building of coalitions among government agencies, parties affected by or contributing to problems in the Region of Concern, and an informed, committed general public. Citizens are important in keeping the regional action planning process focused and moving towards its goals. As well, citizens groups may be active participants in the process—serving as watchdogs, conducting volunteer cleanup and monitoring activities (e.g., schools and churches can sponsor an "adopt a watershed" program, contribute to "Bay or river watch" computer bulletin boards, or help with a speaker's bureau and with periodic conferences and workshops). The resident of a Region of Concern will work harder to secure his or her own future than other, more transient entities (e.g., distant government employees) (Hartig and Zarull 1992; Law and Hartig 1993).

Because the development and implementation of Regional Action Plans is a long-term, ongoing process, continued public involvement and a long-term commitment to regional action planning is essential.

Continued effective involvement can only be maintained, however, if all participants are convinced that the time spent on regional action planning is productive. If the public does not see short-term progress in remediation, they may become disillusioned and abandon the process. Short-term, focused projects must be organized that are of interest to and achievable by the public. Building a record of such successes is one mechanism of sustaining public involvement.

Two important components to any public participation program are to define the elements of effective public participation and to design a public participation program that will produce the support needed for Regional Action Plans. Critical elements to every public participation program are trust, communication, opportunity, and flexibility (Law and Hartig 1993). Trust must be established between those directly involved in the regional action planning process and the public. Although it is the most difficult of the four elements to attain, trust is also the most essential element in a successfully implemented Regional Action Plan. To establish *trust* the following must occur: *communication* must be open between participants, *opportunities* must exist for public input, and *flexibility* must be maintained in the planning process to accommodate both new information and necessary changes in the program.

To build broad-based community support, effective public participation in the regional action planning process should be encouraged throughout the entire planning process. Public involvement should be initiated at the outset of the planning process with the distribution of information (e.g., press releases, public meetings) about the planning process, including goals and objectives, approach, and timeframes and milestones. Opportunities for continued public involvement should also be outlined at that time. Actions to inform and involve the public should occur throughout the life of the planning process, especially at critical stages, such as defining the problems, developing goals and objectives, and brainstorming about implementation actions. The public should also be involved in monitoring the Plan's implementation until restoration is complete. It is not intended that the public become part of the Regional Action Team. Rather, the public participation and education approach provides opportunities for the general public to provide input to the Regional Action Team. Such citizen involvement will provide the Regional Action Plan with invaluable local knowledge, the continuous and vigorous public oversight needed to overcome bureaucratic inertia, and the political will accomplish goals and objectives (Hartig and Zarull 1992; Law and Hartig 1993).

To maximize its effectiveness, the public outreach should compliment existing user groups and avoid costly duplication of other groups' efforts. The Regional Action Plan's public participation programs most useful role may be coordinating between and filling gaps in existing programs. There are many ways to achieve these objectives; however, the following scenario is presented for example. First, the Regional Action Team or its public participation subgroup should identify the Regional Action Plan's educational priorities. Second, existing public education and outreach programs in the Region of Concern should be surveyed. This investigation may demonstrate that many public and private groups in the Region of Concern are addressing issues that the Regional Action Plan deems important. Once the list of major education organizations is compiled, the list can be analyzed for specific geographic areas or focus on a specific issue. The Regional Action Plan represents many interests throughout the Region of Concern and may serve a unique role as coordinator of a network of complementary, overlapping interests. Gaps of information can be filled by sharing and disseminating information and resources.

Not all user groups are the same and the Regional Action Plan should determine the audience's level of knowledge and involvement with the Region of Concern. The Regional Action Plan's public participation program should provide a foundation for a true understanding of issues related to the Region of Concern. Accordingly, the public participation program should devise a public education strategy that provides for different levels of involvement. First, the Regional Action Plan may promote existing programs. Second, the Regional Action Plan may seek to change existing programs or broaden their focus to incorporate Regional Action Plan messages. Third, the Regional Action Plan should encourage the creation of new programs when appropriate. For example, if another group is addressing an issue adequately, the Regional Action Plan may help to promote and publicize its efforts. Whereas, if a second group needs financial or logistical assistance, the Regional Action Plan may try to provide the resources necessary for the group to organize its work. As a last resort, if the Regional Action Plan identifies an educational need that no one else is addressing, then the Regional Action Plan should initiate a new program.

Once it defines areas needing additional involvement, the team should implement a range of public participation and education tools. In addition, the team should coordinate with any existing communications activities that support the Chesapeake Bay Program. Throughout the planning process, the public should be given regular updates through newsletters, fact sheets, and press releases. It is important to communicate possible planning options to the public before they are narrowed or selected. It may also be appropriate to publish a newsletter for each Region of Concern. Team members should periodically speak to organizations that represent sectors of the general public. Among other activities,

the team should establish contacts with the media and encourage regular stories and news clips. The media should be encouraged to take responsibility for educating the public at large by contributing staff and other resources to educational video spots and public service announcements, along with other actions. Depending on the public's involvement in the Region of Concern, it may be useful to consider establishing a nonprofit organization that could promote public education and participation during

**Public Participation and Education Tools**

- Public meetings and hearings
- Public workshops and forums
- Public roundtables
- Speakers' bureau
- Outreach to schools, such as teachers' guides and curricula
- Citizen surveys
- Citizen monitoring and/or watchdog groups
- Newsletters, videos, and television programs
- Annual progress reports
- Computer bulletin boards
- Nonprofit educational groups
- Cleanup days and other special events

plan development and implementation or to build upon the efforts of an existing organization.

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## **CHAPTER 3**

# **CONDUCTING THE REGIONAL ACTION PLANNING PROCESS**

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## **CHAPTER 3**

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**CHAPTER 3. CONDUCTING THE REGIONAL ACTION PLANNING PROCESS**

Regional Action Plans should be developed through a coordinated, consensus-building process overseen by the designated lead agency in the Region of Concern<sup>1</sup> and supported by a stakeholder group, referred to as the Regional Action Team. Although the lead agency has considerable flexibility in its approach to conducting the regional action planning process, the Chesapeake Bay Program expects the lead agency to:

- Develop and deliver a Regional Action Plan to the Chesapeake Executive Council within a designated timeframe
- Use a regional action planning process that considers all stakeholder interests
- Identify and work in consultation with the Regional Action Team throughout the planning process, particularly when identifying priorities, determining an overall project vision, setting goals and objectives, and developing implementation actions and milestones
- Work with the Regional Action Team to include the public in the planning process.

This chapter presents background information useful for conducting the regional action planning process. The chapter describes the anticipated activities of the lead agency and the Regional Action Team in developing a Regional Action Plan, presents information on conducting Regional Action Team meetings and building consensus, and discusses the importance of public participation and education. This information is presented in the following sections of the chapter:

- Overview of the Lead Agency's Involvement
  - Assembling an Effective Regional Action Team
  - Identifying Potential Regional Action Team Members
  - Identifying Regional Action Team Leaders
  - Obtaining Management Support
- Overview of the Regional Action Team's Involvement
  - Identifying Stakeholder Interests
  - Evaluating Environmental Problems and Establishing a Vision Statement, Goals and Objectives
  - Evaluating Existing Management Programs
  - Determining Implementation Actions

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<sup>1</sup>Lead agencies are designated by the jurisdiction(s) containing a Region of Concern.

- Developing a Work Plan
- Conducting Effective Regional Action Team Meetings
- Approaches to Building Consensus
- Public Participation and Education.

Although the guidance recognizes that each Region of Concern is a unique location, with site-specific considerations, the suggestions presented in this chapter apply to most situations and will help determine an efficient and successful regional action planning outcome. Three overarching considerations that apply to all aspects of the planning process include:

- **Someone must coordinate the entire regional action planning process.** The process involves many different steps and participants. In order to keep the process on track, in an orderly and efficient manner, one person should be responsible for mapping each step of the process, assigning roles and responsibilities, and ensuring that tasks get completed on time. This Regional Action Plan coordinator should be affiliated with the group responsible for writing the final plan and delivering it to the Executive Council (generally this group is the lead agency).
- **Roles and responsibilities for each step of the planning process must be clearly defined.** Regional action planning involves many different tasks, including conducting background research, preparing written materials, providing logistical support for Regional Action Team meetings, running Regional Action Team meetings, facilitating decision-making, and writing the final plan. Because different people will be involved in each of these steps, it is essential to clarify, upfront, the roles and responsibilities of each participant. This will clarify the overall approach, ensure efficient participation, and avoid duplication of effort.
- **Each step of the planning process must have a leader.** In addition to the overall plan coordinator, each step of the process must have a discrete leader. Absence of a leader can lead to confusion about roles and responsibilities, cause the process to get off-track, and frustrate participants who are unclear about the best way to participate.

The rationale for having an overall coordinator, defining roles and responsibilities, and identifying leaders for the regional action planning process is simple and straightforward. Regional action planning must occur in an orderly, efficient, and timely fashion so that momentum is maintained, participants' commitment and enthusiasm to the planning process remain high, and goals and objectives are achieved. Defining roles and responsibilities early in the process helps to establish the road map necessary to ensure effective planning. Poorly organized efforts, without a clearly stated mission and understanding of individual and group responsibilities, often fail to achieve the ultimate goal of the regional action planning

process—to develop an implementable plan, representative of the diverse interests in the Region of Concern, that will reduce and prevent problems associated with chemical contamination.

Stakeholder involvement from the early stages is critical to the ultimate success of the Regional Action Plan. Stakeholders are represented through a well-selected Regional Action Team comprised of a diverse group of participants interested in, affected by, or contributing to chemical contaminant-related issues in the Region of Concern. Potential stakeholders for inclusion on the Regional Action Team include representatives from local, state and federal governments; industrial and commercial sectors; citizen and environmental groups; and academic institutions.

Involving stakeholders in the decision-making process leads to local ownership of the Regional Action Plan and a sense of stewardship for the Region of Concern. The coalitions built through an effective stakeholder process will strengthen the Regional Action Plan by elevating the priority given to certain implementation actions, obtaining commitments (e.g., staff resources, funding) for implementation, and engendering trust among diverse interests. In addition, stakeholder commitment is necessary because of the level of political, legal, and behavioral change necessary to achieve some regional action planning goals and objectives. Because of the variety of political bodies and agencies potentially involved in the watersheds linked to a Region of Concern, governmental commitment is also key to affecting change. Most of the implementation actions needed to address a Region of Concern, whether regulatory or nonregulatory, are beyond the conceptual, institutional, and financial reach of any single agency or group and require intra-agency collaboration, public-private partnerships, and stakeholder commitment.

In addition to the Regional Action Team directly involved in plan development, the sustained interest and involvement of the general public is necessary to maintain momentum. The general public can be influential in ensuring that actions are pursued. They can help keep the process focused and, by serving as citizen "watchdogs," can achieve greater accountability from those charged with implementing specific plan recommendations. The general public can also provide technical input to plan development by contributing information and opinions to define problems, assessing existing programs, and determining implementation actions. Citizen groups can also be established to contribute directly to plan implementation by establishing citizen monitoring networks, promoting cleanup days, or initiating other actions. An informed public can provide valuable resources to the regional action planning process, and efforts should be taken, from the start, to ensure public participation.

**Exhibit 3-1. Roles and Responsibilities**

<b>Stakeholder</b>	<b>Role/Interests</b>	<b>Responsibility</b>	<b>Comments/Other Considerations</b>
Lead agencies	Manage plan development in cooperation with stakeholders (i.e., Regional Action Team) and form institutions with public involvement and commitment	Protect water quality and develop and implement a Regional Action Plan	Establish and coordinate the team and provide technical and financial resources
Responsible agencies (federal, state, and local)	Support plan development and pursue various public interests	Assist lead agencies and commit technical and financial resources; participate in relevant implementation actions	Exercise jurisdiction over resources or management decisions
Industry and local businesses	Ensure business interests are represented in the plan	Contribute technical expertise, time, and funding; participate in relevant implementation actions	Educate the public and inform constituencies of progress and issues
Citizen/environmental groups	Ensure environmental protection issues are represented in the plan	Attend meetings, perform outreach, serve as watch dog for planning process, participate in plan implementation	Educate the public and inform constituencies of progress and issues
Educational institutions	Ensure that scientific and other educational information is disclosed	Provide subject area expertise and perform outreach, technical research, and monitoring	Make grants available to support such projects
General Public	Attend public meetings/hearings and other events about the Region of Concern. Contribute ideas, opinions, and information.	Become informed and serve as "watchdogs" for plan implementation. Maintain political pressure. Take personal responsibility for actions that will improve conditions in the Region of Concern (e.g., recycle, minimize use of hazardous chemicals).	Informing the public early on and throughout the process is a good way to maintain momentum and pressure to ensure implementation.

Exhibit 3-1 provides an overview of the types of key players likely to be active in the regional action planning process. The exhibit outlines major roles and responsibilities and describes the interests of these stakeholders, including lead agencies, other government agencies, industry and local business, citizen/environmental groups, and educational institutions. Later sections of this chapter describe a process for selecting a balanced and representative Regional Action Team from these types of groups.

### **3.1 OVERVIEW OF THE LEAD AGENCY'S INVOLVEMENT**

The lead agency is designated by the jurisdiction(s) having a Region of Concern to oversee the regional action planning process, including plan development and implementation. The lead agency's responsibilities include establishing and coordinating the Regional Action Team, providing technical and financial resources, and offering leadership for the regional action planning process. It is very important that the lead agency be committed to the regional action planning process and work with the Regional Action Team to gather support from elected officials.

The lead agency has a great deal of flexibility in choosing an approach for implementing the regional action planning process. Bearing in mind that the ultimate responsibility of the lead agency is to deliver a Regional Action Plan to the Chesapeake Executive Council by an established deadline, the lead agency can use, or modify, one of several approaches depending on the level of public and stakeholder commitment required to develop and implement the Regional Action Plan, and available funding and other resources:

- Maintain full responsibility for plan development, using the Regional Action Team in an advisory capacity (e.g., reviewing and commenting on materials prepared by the lead agency)
- Share responsibility with the Regional Action Team (e.g., identify the various tasks needed to complete the plan and divide responsibilities according to expertise and ability/willingness to contribute)
- Delegate all authority for plan development to the Regional Action Team (e.g., lead agency may provide technical support, but Regional Action Team has full control in guiding the planning process and making recommendations).

Regardless of the approach taken, it is essential to clearly define roles and responsibilities at the outset. If the lead agency chooses to delegate some or all of its authority to an existing group, it might want to develop a formal or informal memorandum of understanding clearly stating roles, responsibilities, and expectations of the groups involved. If such clarification of roles and responsibilities is not offered early in the planning process, involved parties, including Regional Action Team members, might become confused, frustrated, and disillusioned with the process.

Experience suggests that the most effective approach is one of shared responsibility between the lead agency and the Regional Action Team (Chesapeake Bay Program 1990; Davidson 1994; Harris 1994; Schramik 1994; Shuyler 1994; Swiniuch 1994; Hartig et al. 1994). This approach is often successful because it utilizes the technical and financial resources of the lead agency, while seeking the energy, creativity, support, and commitment from the stakeholders who will ultimately determine the plan's success. Regardless of the approach used by the lead agency, it is important that adequate time be allocated for plan research and development in order to generate a sound, credible, and implementable plan. The lead agency, working with the Regional Action Team, should try to identify and seek involvement from all significant stakeholders and thoroughly understand stakeholder interests. The Regional Action Team should also be given sufficient time and resources to conduct the decision-making process needed to develop a sound implementation approach (e.g., identifying a complete range of implementation actions, such as nonpoint source control techniques, pollution prevention plans, legislative

changes, funding, public involvement). By following this process, it is more likely that the solutions developed will be more acceptable to the team and innovative than a plan produced by a single agency.

### **3.1.1 Assembling an Effective Regional Action Team**

One of the most important early responsibilities of the lead agency is to assemble an effective Regional Action Team. Although many factors determine team effectiveness, it is of utmost importance that the team be balanced and representative of key stakeholders in the Region of Concern. When assembling the team, the lead agency may want to start with existing stakeholder groups (e.g., the Anacostia Watershed Restoration Committee, the Elizabeth River Project) or develop a new group, drawing members from existing stakeholder groups. As one of its first steps in the planning process, the lead agency should conduct enough background research on the Region of Concern to identify groups and/or individuals already active in the Region of Concern. Depending on the situation in the Region of Concern, the lead agency should coordinate with existing stakeholder groups or active individuals, or invite other involved parties (e.g., local governments) to join an initial selection committee (formal or informal) to assemble the Regional Action Team. The lead agency, in conjunction with its partners in the Region of Concern (e.g., selection committee) should determine the size and structure of the Regional Action Team and identify affected parties (i.e., persons/groups associated with or affected by chemical contamination in the Region of Concern), key decision-makers, and subject matter experts to include as participants on the Regional Action Team. When identifying groups and/or individuals to assist in the Regional Action Team selection process, and again when identifying potential team members, it is important to have the participation of individuals who adequately represent the wide variety of interests of those affecting and being affected by chemical contamination problems in the Region of Concern. It is especially important to involve individuals and/or groups that will play lead roles in implementing the Regional Action Plan. Section 3.1.2 of this guidance provides more specific direction on a process that can be used to identify and select Regional Action Team members.

Although it is critical to include representative stakeholders on the Regional Action Team, it is also important to keep the group size manageable—no more than 15 to 20 members are suggested (optimal size is 7 to 15). This smaller number gives the group flexibility and allows it to operate in an efficient manner. It also enhances the consensus-building process, which is essential to the ultimate success of the Regional Action Plan. Although larger groups are possible, it becomes harder to ensure equitable involvement from all team members, and the decision-making process may be more unwieldy. If a group larger than 15 or 20 individuals is required, it may be necessary to form subcommittees (e.g., by source of pollution/land use category). To make drafting the Regional Action Plan workable, a

drafting subcommittee, including approximately five members, may be formed. Alternatively, if resources are available, it may be possible for the lead agency to provide staff and/or contractor support to assemble background materials needed to develop the Regional Action Plan. If such "outside" sources, or even a drafting subcommittee of the Regional Action Team, are used to prepare sections of the Regional Action Plan, all stakeholders comprising the Regional Action Team should agree on the input using a consensus-based approach. Section 3.5 in this chapter ("Approaches to Building Consensus") provides an overview of several approaches to building consensus.

Regional Action Team members should be enthusiastic and energetic about the planning process, have leadership abilities, and be committed to the consensus approach to decision-making. Ideally, the members should have technical familiarity with the issues facing the Region of Concern, but be involved in management to the extent that they can influence the decision-making processes of the organizations they represent. The members should also be able to speak with confidence about the feasibility of putting the proposed implementation approach to work. It is important to involve both those who can contribute to the planning process and those who can contribute to the implementation of the Regional Action Plan.

While it may be tempting to include only supporters of the regional action planning process on the Regional Action Team, it is crucial to select team members representing all affected parties, especially those that might be responsible for implementing a particular plan recommendation. By including representatives from potentially resistant groups (e.g., a major contributor of chemical contamination) in the early stages of the planning process, it may be possible to allay fears, build trust, and develop an implementable plan that avoids potential pitfalls from the lack of cooperation and resistance that could occur if affected parties feel excluded from the planning dialogue. When seeking to include members from potentially resistant groups, it is helpful to identify individuals from those groups who will give the process a chance, agree to use a consensus-based approach, and are willing to participate.

Exhibit 3-2 summarizes selected issues key to assembling an effective Regional Action Team. If these concerns are considered and a strong commitment to a consensus-based process-using stakeholders is pursued, then it should be possible to develop a sound, implementable plan. However, there is no guarantee that any one team will succeed. Participants should look for warning signs and avoid pitfalls, such as those listed in Exhibit 3-3.

**Exhibit 3-2. Key Elements to Establishing a Regional Action Team**

- Determine appropriate participants. Represent affected parties (i.e., persons whose use of the Region of Concern is impaired by chemical contamination *and* groups associated with chemical contamination), subject matter experts, and key decision-makers. Ideally, participants should be able to represent groups of affected parties (e.g., trade associations, coalition of several environmental organizations) rather than individual entities (e.g., a single facility). Involve representatives from groups potentially responsible for implementing aspects of the plan.
- Select a team that is balanced and representative of all affected parties. One group should not dominate. In most cases, it is inappropriate for more than one individual from a single entity to participate.
- Identify affected parties and other potential Regional Action Team members by initially examining available information on the nature of problems in the Region of Concern. After gaining a preliminary understanding of problems in the Region of Concern, identify the types of affected parties associated with each problem. Seek out existing organizations and/or individuals active in the Region of Concern for advice on potential Regional Action Team members.
- Identify enthusiastic, open-minded, and energetic participants who are committed to the consensus-building process and have time to devote to developing a Regional Action Plan.
- Avoid inviting people not affected by the objective(s) of the Regional Action Plan. Also avoid disinterested, unreliable individuals, and/or known meeting "disrupters."
- Aim to have an adequate and balanced stakeholder group that is large enough to contain the knowledge and opinions relevant to the planning task, but strive for a manageable group size. For decision-making activities, the optimal group size is 7 to 15 participants. If more participants are needed, consider establishing smaller subgroups.
- Seek continuity of process and a balanced and representative group at all times by having team members designate an alternate in case they are unable to attend a meeting.

**Exhibit 3-3. Reasons Why Consensus Groups Fail**

- Failure to produce a plan that represents the interests of all significant stakeholders. This is often caused when certain stakeholders, such as environmental groups, do not join the team. Groups who do not join the team usually attack what they do not like in the draft plan when it is presented for lead agency review or review by the governing body. Therefore, it is important to make every effort to involve each significant stakeholder group in the process directly or indirectly (e.g., by becoming a corresponding member who receives meeting notes and is contacted regularly for ideas and opinions).
- Members walk away from the process or do not commit to the process. This is usually because team members believe their interests can be represented better in another way (e.g., in court, directly with elected officials).
- The team fails to deliver a Regional Action Plan that is adequate to guide implementation. Without clear goals and objectives and strong leadership, teams tend to produce vague plans that do not resolve major issues (e.g., specific implementation tools, such as farm pollution prevention plans to control urban and agricultural runoff).
- The team loses momentum, thereby causing key members to abandon the process. Loss of momentum is usually caused by inefficient and poor process management and getting bogged down on difficult issues.



### **3.1.2 Identifying Regional Action Team Members**

Stakeholder groups, such as the Regional Action Team, should be balanced and represent key decision-makers and affected parties (i.e., persons/groups associated with or affected by chemical contamination) in the Region of Concern. To determine which stakeholders should participate in the Regional Action Team, it is necessary to examine the nature of the chemical contamination problems in the Region of Concern. The lead agency, in conjunction with a formal or informal selection committee,<sup>2</sup> should assemble and analyze readily available information (e.g., written documentation, personal contact with knowledgeable individuals) to develop a preliminary overview of problems in the Region of Concern. This understanding of problems is the necessary first step for identifying parties affected by or contributing to beneficial use impairment and/or other adverse effects of chemical contamination. After understanding the problems, it is possible to link candidate stakeholder groups and individual representatives of those groups to the problems. Each step of the process to identify Regional Action Team members is summarized below:

- **Assess Nature of Problems**—Lead agency, working with existing stakeholder groups and/or individuals active in the Region of Concern, conducts preliminary investigations to determine the nature of chemical contamination problems in the Region of Concern. Readily available written material (e.g., technical reports, newspaper articles), supplemented by discussions with informed groups or individuals, should be assembled and summarized.
- **Identify Stakeholder Categories to be Represented on the Regional Action Team**—Information on problems and sources of problems provide the basis for identifying the types of stakeholders that should be represented on the Regional Action Team. The lead agency, in consultation with other key groups and/or individuals, develops a generic list of stakeholder categories (e.g., fishing industry, property owners, chemical industry, environmental groups) that should be included.
- **Identify Actual Representatives from Generic Stakeholder Categories**—The lead agency, in consultation with other key groups and/or individuals, analyzes background information to match specific names with stakeholder categories. A review of the literature, but more likely personal knowledge/recommendations from groups and/or individuals already involved in the Region of Concern, will help to identify specific persons associated with each generic stakeholder category. Efforts should be made to identify individuals that represent groups of stakeholders (e.g., an industry association or business group that captures multiple business/industry groups in the Region of Concern). It is important to avoid duplication—there is no need for two or more representatives from any particular stakeholder category; certainly not from the same location/facility/group.

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<sup>2</sup>The lead agency may want to coordinate with existing groups and/or individuals (e.g., an existing stakeholder group such as the Elizabeth River Project or the Anacostia Watershed Restoration Committee) active in the Region of Concern, as well as other involved parties (e.g., local governments) to form a Regional Action Team Selection Committee.

Exhibits 3-4 and 3-5 provide an example of the process of identifying Regional Action Team members. Exhibit 3-4 illustrates each step of the process, while Exhibit 3-5 displays a hypothetical list of stakeholder categories developed from the example in Exhibit 3-4.

In addition to the lead agency, the likely stakeholders to be involved in the process include other relevant local, state, and federal agencies; industry and other business organizations; citizen/environmental groups; and educational institutions. Other organizations and individuals that may be stakeholders include commercial and recreational fishing groups, landowners, homeowner associations, and community organizations, such as civic groups and churches. Ethnic and minority group participation should be a priority.

The ideal candidate for a Regional Action Team is enthusiastic, energetic, and committed to a consensus-building planning process; has leadership abilities; is technically familiar with issues in the Region of Concern and is a key decision-maker and/or connected to management so that he or she can speak with some reliability and commitment about the organization's resources and ability to participate; is willing to contribute to the planning process and/or plan implementation. It is important to match up a region's problems with appropriate team members. For example, if contaminated dredging materials are a problem in one area, the Regional Action Team should probably include representatives from local ports and the U.S. Army Corps of Engineers. If urban nonpoint source runoff is a concern, the team should probably include city planners, developers, and property owners. For regions affected by agricultural runoff, agricultural stakeholders should be invited to join the team. Exhibit 3-6 lists potential stakeholders representing various interests and matches them with associated problems.

If the lead agency is uncertain about whether to include certain stakeholders, it is possible to rank potential stakeholders by their expected level of impact on the planning process, as well as by process impacts on them. For instance, certain stakeholders may have more influence on the process than others. Similarly, the outcome of the process (e.g., specific cleanup and funding commitments) may affect stakeholders differently. Other ranking or selection factors include anticipated commitment to the process and the expertise and skills the team requires. Because the regional action planning process occurs over an extended period of time, may require participation in meetings and materials preparation, including possibly drafting portions of the plan, it is important to select members—public and private—who have the time and resources to make this commitment. Because the Regional Action Plan will be a technical, as well as a policy, document, the team should include scientists and engineers.

**Exhibit 3-4. Example of Procedure to Identify Participants  
for the Regional Action Team**

- **Assess Nature of Problems**—Attaboy Creek was designated by the Executive Council as a Region of Concern. The state Department of Environment was designated as the lead agency but is sharing responsibility with an existing group, "Friends of Attaboy Creek." The Department of Environment, working closely with Friends of Attaboy Creek leaders, assembled and reviewed all readily available background materials. Reports developed by several State agencies and a local university documented many ways that chemical contamination has affected the aquatic living resources in the Attaboy Creek Region of Concern—straining the fish and shellfish populations, causing physical deformities, and destroying the fishing industries. The background information, supplemented by several conversations with university professors and State officials, suggests that most of the chemical contaminants are heavy metals and organics. Given the land use and industrial base of the area, experts suggest that the identified problems are most directly a result of industrial and manufacturing discharges, shipyard discharges, and nonpoint source runoff from commercial and industrial areas. Preliminary research summarized in the background material also suggests such linkages between problems and sources.
- **Identify Stakeholder Groups to be Represented on the Regional Action Team**—After assessing the background materials, the state Department of Environment and its partner, Friends of Attaboy Creek, objectively identified the groups being harmed by chemical contamination (e.g., fisheries) and the groups contributing to or responsible for sources contributing to chemical contamination (e.g., shipyards, municipal planners responsible for storm water control). The Department of Environment and Friends of Attaboy Creek leaders compiled these stakeholder categories into a table (see Exhibit 3-5) to use as the basis for identifying actual representatives, (i.e., individual names) from the stakeholder groups.
- **Identify Actual Representatives from Generic Stakeholder Group Categories**—The lead agency in consultation with other key groups and/or individuals, analyzes background information to match specific names with stakeholder categories. A review of the literature, but more likely personal knowledge/recommendations from groups and/or individuals already involved in the Region of Concern, will help to identify specific persons associated with each generic stakeholder category. Efforts should be made to identify individuals that represent groups of stakeholders (e.g., an industry association or business group that captures multiple business/industry groups in the Region of Concern). It is important to avoid duplication—there is no need for two or more representatives from any particular stakeholder category; certainly not from the same location/facility/group. For example, John Doe may represent an association of shipyards in the Region of Concern. Because he represents multiple shipyards, he would be a good candidate for the Regional Action Team.

Available sources on potential stakeholders are extensive, including surveys of existing stakeholder groups active in the Region of Concern; the *Chesapeake Bay Program Directory*, published annually by the Chesapeake Bay Program Office; local Chamber of Commerce directories; industry directories; lists of government agencies in the area; lists of individuals who have participated in relevant meetings/hearings organized by agencies (e.g., National Pollutant Discharge Elimination System [NPDES] public hearings on draft permits, Chesapeake Bay Program Tributary Strategy hearings); and lists of members of the environmental and conservation community (e.g., annually published *National Wildlife Federation Conservation Directory*). Local planning documents, environmental impact studies, and directories of local planning and economic development commissions may also be useful sources of

**Exhibit 3-5. Example of a Stakeholder Category Table Used to Identify Participants for the Regional Action Team**

<b>Stakeholder</b>	<b>Reason for Inclusion</b>
<b>Business/industry</b>	Industry and manufacturing are the primary causes of the toxics problems within the Attaboy Creek Region of Concern. Businesses are affected directly by the success of industry. Involving these interests in the planning process may help to develop a more easily accepted plan and may reduce opposition. The main businesses and industry active in the Attaboy Creek Region of Concern are marinas and shipyards, chemical manufacturing plants, and petroleum refineries.
<b>Citizen/environmental groups</b>	Citizens are affected daily by the conditions in which they live. Environmental organizations exist to protect the interests of the citizens and wildlife affected by the health of the environment. The primary citizens groups are the Rotary Club, Jaycees, local garden clubs, and local Parent Teachers Associations. The most active environmental organizations are the Sierra Club and Friends of Attaboy Creek.
<b>Federal government</b>	Federal Government involvement is beneficial in the implementation of the Regional Action Plan. The government has the ability to create and enforce regulations, if necessary, as well as provide financial support for the effort. The U.S. military plays the largest Federal role in the Attaboy Creek Region of Concern, including the presence of the largest U.S. Naval shipyard. The U.S. Army Corps of Engineers, U.S. Coast Guard, and U.S. Fish and Wildlife Service also have large roles in the Attaboy Creek Region.
<b>State government</b>	State government is important in both the planning and implementation phases of the Regional Action Plan. It has the primary responsibility for developing the Regional Action Plan and also has the authority and financial resources to facilitate implementation.
<b>Fisheries</b>	The fisheries and fishery industries have been the group most severely affected by the chemical contamination problem in the Attaboy Creek Region of Concern. The stress put on the fish populations has been excessive, and it is the most obvious indicator of the problems existing.
<b>Land owners/home owners</b>	Land owners and home owners are financially, physically, and aesthetically affected by the health of Attaboy Creek. They also may be affected by proposed actions to protect the river.
<b>Local government</b>	The local government represents individuals living in proximity to Attaboy Creek. The government has control over zoning regulations and other potential actions. There are four cities and two counties in the Attaboy Creek Region of Concern.
<b>Recreational/tourism</b>	Attaboy Creek is attempting to develop a tourism industry that would greatly benefit from the restoration of Attaboy Creek. Recreational users (i.e., pleasure boaters, sport fisherman, and swimmers) would also benefit from cleaner and healthier waters.
<b>Scientists/educators</b>	Faculty from area colleges and universities may have knowledge and information that would be useful in the development of the Regional Action Plan. They can also assure that decisions are being based on accurate data.

Exhibit 3-6. Overview of Potential Stakeholders Within the Chesapeake Bay Watershed

Potential Problem	Federal Stakeholder Groups															
	US EPA, Region III	USEPA, CBPO	DoD (including Army, Navy, etc.)	USFWS Chesapeake Bay Field Office	USFWS Patuxent Wildlife Research Center	USCS Water Resources Division	National Park Service	National Biological Survey	USCG (info about spills, shipping)	USDA Forest Service	USDA Agricultural Research Service	NOAA National Marine Fisheries Service	NOAA Chesapeake Bay Office	USFDA	Army Corps of Engineers	Federal Land Owners
Fishkills	•	•	•	•				•			•	•	•	•		
Finfish/shellfish tissue contamination	•	•	•	•				•			•	•	•	•	•	
Finfish tumors	•	•	•	•							•	•	•	•	•	
Restrictions on shellfish harvesting	•	•	•	•			•				•	•	•	•	•	
Degradation of benthic community	•	•	•	•			•	•			•		•	•	•	
Water column toxicity	•	•			•		•				•	•		•	•	
Sediment toxicity	•	•			•		•				•	•		•	•	
Restrictions on fish and wildlife consumption	•	•	•	•	•		•				•	•	•	•	•	
Degradation of fish and wildlife populations	•	•	•	•		•	•	•			•	•		•	•	
Degradation of phytoplankton/zooplankton populations	•	•	•	•		•	•	•			•			•	•	
Bird and/or animal deformities or reproductive problems	•	•	•	•	•		•	•				•		•	•	
Tainting of fish and wildlife flavor	•	•	•	•	•		•	•			•	•	•			
Loss of fish and wildlife habitat	•	•	•	•	•		•	•	•		•	•		•	•	
Restrictions on drinking water consumption	•	•										•				
Restrictions on dredging activities	•	•	•				•							•	•	
Sediment contamination	•	•	•		•		•				•	•		•	•	
Water column contamination	•	•	•		•		•				•	•		•	•	
Groundwater contamination	•	•	•		•						•	•			•	
Added costs to agricultural/industrial water use consumption	•	•							•	•						
Beach closings	•	•	•		•											
Aesthetics degradation	•	•	•		•									•	•	
Sediment transport/erosion	•	•	•		•	•		•	•	•				•	•	
Stormwater runoff/Combined Sewer Overflows	•	•	•		•					•				•	•	
Urban runoff	•	•	•		•			•		•				•	•	
Agricultural runoff	•	•			•			•	•	•				•	•	
Atmospheric deposition of contaminants	•	•	•		•	•				•					•	
Industrial discharges exhibiting acute/chronic toxicity	•	•	•												•	
Municipal discharges exhibiting acute/chronic toxicity	•	•														
Superfund sites	•	•	•												•	
Hazardous waste transfer/storage facility	•	•	•												•	

Exhibit 3-6. Overview of Potential Stakeholders Within the Chesapeake Bay Watershed

Potential Problem	State Stakeholder Groups										Local Stakeholder Groups									
	State Environmental Protection Agency	State Resource Protection Agency	Public Works Administration	State Department of Agriculture	State Dept. of Conservation (land & water)	State Water Quality Control Board(Comm.	State Comm. on Fisheries (inland) & Game	State Comm. on Marine Resources	Port Authority	County Planning Office	County Environmental Services	Public Works	Soil and Water Conservation Services	CBP/3 Local Govts. Advisory Committee	Interstate Comm. on the Potomac River Basin	Metro. Wash. Council of Govt.	Regional Fisheries or Watershed Comms.	Harbor Master	Local Water Quality/Resources Board	County Associations
Fishkills	•	•			•	•	•			•			•	•		•		•		
Finfish/shellfish tissue contamination	•	•			•	•	•			•			•	•		•		•		
Finfish tumors	•	•																		
Restrictions on shellfish harvesting	•	•			•	•	•			•			•					•		
Degradation of benthic community	•	•												•	•			•		
Water column toxicity	•	•		•	•					•		•	•	•	•			•		
Sediment toxicity	•				•			•		•			•	•	•			•		
Restrictions on fish and wildlife consumption	•	•				•	•						•	•				•		
Degradation of fish and wildlife populations	•	•				•	•						•	•	•					
Degradation of phytoplankton/zooplankton populations	•	•												•	•	•				
Bird and/or animal deformities or reproductive problems	•	•		•		•	•							•						
Tainting of fish and wildlife flavor	•	•				•	•						•	•		•				
Loss of fish and wildlife habitat	•	•		•		•	•			•			•	•	•			•	•	
Restrictions on drinking water consumption	•		•	•						•	•		•	•	•			•		
Restrictions on dredging activities	•		•		•		•	•		•	•		•		•			•		
Sediment contamination	•	•			•			•					•	•	•	•		•		
Water column contamination	•	•		•	•					•		•	•	•	•			•		
Groundwater contamination	•	•		•	•	•				•		•	•	•	•			•		
Added costs to agricultural/industrial water use consumption	•		•	•	•					•	•	•	•	•				•	•	
Beach closings	•									•	•	•						•	•	
Aesthetics degradation	•									•	•	•		•	•			•	•	
Sediment transport/erosion	•	•		•	•			•		•	•	•		•	•			•	•	
Stormwater runoff/Combined Sewer Overflows	•		•							•	•	•	•	•	•			•	•	
Urban runoff	•		•		•					•	•	•	•	•	•			•	•	
Agricultural runoff	•			•	•					•		•		•	•			•	•	
Atmospheric deposition of contaminants	•									•			•	•					•	
Industrial discharges exhibiting acute/chronic toxicity	•					•							•	•	•			•	•	
Municipal discharges exhibiting acute/chronic toxicity	•		•			•				•			•	•	•			•	•	
Superfund sites																				

Exhibit 3-6. Overview of Potential Stakeholders Within the Chesapeake Bay Watershed

Potential Problem	Citizen/Environment General Stakeholder Groups	Chesapeake Bay Commission	Alliance for the Chesapeake Bay	Chesapeake Bay Foundation	CBP's Citizens Advisory Committee	Property Owners (residential)	Sierra Club	Local Ducks Unlimited	Local Audubon Chapter	Local Save Our Streams Chapter	Private/Commercial/Industrial/Highly Visible	Chambers of Commerce	Local Watermen's Association	Trade and/or Business Associations	Industrial Groups/Councils	Property Owners (Rural/Ag/Comm)	Local to ROC	Residential Stakeholder Group	General	University Sea Grant Programs	University Water Resources Centers	Chesapeake Research Consortium
Fishkills																						
Finfish/shellfish tissue contamination																						
Finfish tumors																						
Restrictions on shellfish harvesting																						
Degradation of benthic community																						
Water column toxicity																						
Sediment toxicity																						
Restrictions on fish and wildlife consumption																						
Degradation of fish and wildlife populations																						
Degradation of phytoplankton/zooplankton populations																						
Bird and/or animal deformities or reproductive problems																						
Tainting of fish and wildlife flavor																						
Loss of fish and wildlife habitat																						
Restrictions on drinking water consumption																						
Restrictions on dredging activities																						
Sediment contamination																						
Water column contamination																						
Groundwater contamination																						
Added costs to agricultural/industrial water use consumption																						
Beach closings																						
Aesthetics degradation																						
Sediment transport/erosion																						
Stormwater runoff/Combined Sewer Overflows																						
Urban runoff																						
Agricultural runoff																						
Atmospheric deposition of contaminants																						
Industrial discharges exhibiting acute/chronic toxicity																						
Municipal discharges exhibiting acute/chronic toxicity																						
Superfund sites																						
Hazardous waste transfer/storage facility																						

potential stakeholders. Interviewing key stakeholders or community leaders for recommendations is another way to identify stakeholders.

### **3.1.3 Identifying Regional Action Team Leaders**

It is critical to identify and cultivate leaders for a Regional Action Team. The most important role for the team leaders is to work with the lead agency and its partner or designee to determine an overall approach for the regional action planning process, including defining roles and responsibilities for the Regional Action Team and establishing a schedule for completing each step of the process. It is essential that the team leaders understand the goals and objectives of the regional action planning process and are able to convey them to the Regional Action Team. The team leaders are also responsible for running Regional Action Team meetings (e.g., ensuring the meeting agenda is followed and topics are covered in a timely fashion), although they may be supported by other parties (e.g., professional facilitator, lead agency.)

In a consensus-based process, like that envisioned for regional action planning, team leaders should orchestrate, but not dictate, the process. Leaders contribute to the process by providing ideas and information, offering approaches for continued progress, ensuring that the process stays on track and encouraging enthusiastic participation and commitment. They should enjoy respect from the other team members and not show bias when leading meetings, regardless of the interests they represent. In some cases, if the team leader is qualified, he or she may also facilitate the decision-making and/or consensus-building, portions of Regional Action Team meeting. However, if a leader wants to negotiate or otherwise represent his or her interests, then facilitation responsibilities should be given to another team member or outside facilitator.

Leaders for the Regional Action Team can be provided by the lead agency, selected from the Team's membership, or obtained from an outside source. They all should be required to commit substantial time to the process and be enthusiastic about their commitment. Exhibit 3-7 summarizes additional qualities of the team leaders.

To remove any perceptions of bias and to provide objectivity to the planning process, it may be advantageous to use a professional facilitator for the decision-making and/or consensus-building portions of Regional Action Team Meetings (e.g., developing evaluation criteria to select implementation actions). Although some stakeholders may object to a facilitator because of concerns that a facilitator may inhibit team members (e.g., in terms of influencing the process or applying their own leadership skills),



**Exhibit 3-7. Team Leader Qualities**

- Is a significant stakeholder, but able to remain objective
- Is committed to a consensus-based process, not an autocratic one; is not overly directive in the effort to reach agreement
- Makes time commitment to plan process and goals
- Is organized and energetic to help maintain momentum
- Contributes expertise and skills
- Offers leadership
- Has experience managing and facilitating meetings
- Is willing to contribute resources of organization (may not be possible for each member)

experienced facilitators, involve team members in leading and managing the process. For example, a professional facilitator can periodically assign facilitation responsibilities to a team member. This may give the facilitator a chance to evaluate the approach taken to date and plan the next step in the process.

The facilitator should have experience in applying a consensus-based approach to solving environmental problems. Although specific knowledge of the technical issues regarding watershed restoration is not necessary, the facilitator or facilitation team can also contribute to the process by providing briefings on background information, such as concept papers or fact sheets, and organizing meeting notes. If a team does not have access to a professional facilitator, a facilitator could be chosen from the team or provided by the lead agency. The ideal candidate has leadership abilities, experience successfully facilitating similar meetings, and an understanding of the regional action planning process. If a non-professional facilitator is used (e.g., someone is appointed from the team), it is recommended that the facilitator and as many team members as possible attend a training workshop on consensus-based decision-making. This training should be sponsored by the lead agency.

**3.1.4 Obtaining Management Support**

The goal of any regional action planning effort is to develop an implementable plan that will effectively reduce and prevent problems associated with chemical contamination in a designated Region of Concern. To be successful in meeting this overall goal, a plan must have a committed management and staff. Individuals believing in the concepts of regional action planning and the proposed implementation approach must exist at all levels, from top management to the staff person(s) who are ultimately responsible for implementing the plan recommendations. The lead agency must provide this level of commitment because it is responsible for initiating the regional action planning process, ensuring

development of the plan, and providing long-term oversight of the implementation actions. Committed management can ensure continued involvement throughout the regional action planning process by directing staff and financial resources; obviously, interest and commitment from the highest levels of management can have the greatest impact. Ideally, the senior agency official responsible for the Regional Action Plan should attend the initial meeting to explain the purpose and importance of the regional action planning activity, the role of the Regional Action Team, and the commitment of the lead agency. Better yet, demonstrated support from elected officials will lend credibility to the process. Team members will be more likely to commit to the planning process if they know that it has the support and commitment from the lead agency's management and/or elected officials. This type of high-level support will lend credibility to the planning process; give team members a heightened sense of purpose that their efforts are important, needed, and will be considered; and may foster greater involvement and cooperation from team members.

Because proposed implementation actions are likely to involve multiple groups (government agencies, affected parties such as industry), management and staff support and commitment from these groups are also critical. Another key role of the lead agency, supplemented by the Regional Action Team, is to provide education and outreach to these groups to ensure that they have a clear understanding of the overall goals of the Regional Action Plan and their roles and responsibilities in implementing proposed actions. The groups should be trained in the importance of the regional action planning process and the implementation actions to which they are charged.

#### **Importance of Government Commitment**

Remedial action planning in the Great Lakes' Ashtabula River, Ohio, benefited greatly from demonstrated support from top level agency management and elected officials. After years of perceived inaction addressing severe environmental problems, demonstrated by the lack of actual cleanup actions, the public greeted the first public meeting of the remedial action planning process with cynicism. However, Ohio EPA continued to stress the importance of public involvement at all stages of the planning process. As well, Ohio EPA and Ohio State Senator Robert Boggs invited community members to a meeting to discuss environmental problems of the Ashtabula Area of Concern, the remedial action planning guidelines, and its plan to establish local input at the early stages. The involvement of the well-respected local government official, plus the demonstrated commitment of Ohio EPA, influenced the eventual active participation of many local citizens and community leaders (Letterhos 1992).

In a geographically based approach to chemical contamination prevention and reduction such as that envisioned for Regions of Concern, many different actions, focused on a variety of pollutant types and sources, often occur simultaneously. To ensure smooth, consistent implementation of the plan, it is helpful to have an enthusiastic plan coordinator. The Regional Action Plan coordinator should be

affiliated with the group responsible for writing the final plan and delivering it to the Executive Council (generally this group is the lead agency). An ideal coordinator will be an enthusiastic, organized, and knowledgeable community member, who has the authority to make the recommended changes and who is provided the financial and technical resources to complete his or her job.

### **3.2 OVERVIEW OF THE REGIONAL ACTION TEAM'S INVOLVEMENT**

As described in Section 3.1, the type and level of the Regional Action Team's involvement in the regional action planning process will vary depending on the planning approach selected by the lead agency. If the lead agency chooses to maintain full responsibility for plan development, then the Regional Action Team's role is somewhat limited to reviewing and commenting on material prepared by the lead agency. On the other hand, the lead agency may delegate all authority for plan development to the Regional Action Team. In this scenario, the Regional Action Team is responsible for assembling and evaluating background materials and developing draft chapters of and recommendations for the plan.

The Chesapeake Bay Program recommends an approach of shared responsibility between the lead agency and the Regional Action Team. This type of approach, involving participation of both parties, is successful because it draws upon the technical and financial resources of the lead agency, while still involving stakeholders in decision-making and consensus-building so that buy-in and commitment to the plan is achieved. One way to implement this approach of shared responsibility is to have the lead agency develop relevant background materials and options papers to be used as the foundation for a facilitated consensus-building process involving the Regional Action Team. Background papers provide an overview of the issue, while options papers suggest choices of language for the plan and/or plan recommendations (e.g., implementation actions). Section 3.5 of this chapter describes this process in more detail.

It is essential for the Lead Agency and the Regional Action Team to decide early in the planning process how they want to approach development of the Regional Action Plan, including defining appropriate roles and responsibilities for each step of the process. The approach should be mutually decided and understood by all parties in order for the planning process to proceed effectively. Recognizing that the exact approach to conducting the regional action planning process will be unique to each Region of Concern, the Regional Action Team should be involved in the development of the Regional Action Plan at least to the following extent:

- Evaluating background materials
- Providing expertise and input for the plan (e.g., technical materials, recommendations for additional sources of material and contacts)

- Supporting the decision-making process required for effective plan development.

The Regional Action Team's most important role is that of participating in the decision-making process. As discussed throughout this guidance document, the regional action planning process, and final plan, must be streamlined and focused on priority issues so that limited resources are effectively used. Therefore, many of the steps needed to complete the plan involve decision-making about priorities (e.g., What are the most important adverse ambient effects? What chemical contaminant types and sources are the greatest concern? What implementation actions should be pursued first?). The Regional Action Team should be involved in all decision-making aspects of the plan. In fact, many of tasks toward developing the Regional Action Plan should be accomplished in a consensus-building framework, where the affected parties (stakeholders) are represented by the Regional Action Team.

The remainder of this section further describes the anticipated involvement of the Regional Action Team in the planning process. The information is presented in the following subsections:

- Identifying stakeholder interests
- Evaluating environmental problems and establishing goals and objectives
- Evaluating existing management programs
- Determining implementation actions.

### 3.2.1 Identifying Stakeholder Interests

The interests of stakeholders participating on the Regional Action Team should be identified as soon as possible, perhaps as early as the initial team meeting. The information gained in this process will help team members understand each other's motivations, as well as the interests that lie behind any positions that might be taken in the planning process. This information can foster an open and honest dialogue.

It is important that team members not judge or evaluate interests—every interest represented by a stakeholder should be welcomed and recorded. The interests generally pertain to human health and the environment, as well as to economic and social issues. The team should make every effort to represent non-human environmental interests.

Positions represent a group's or individual's stand or decision about an issue, whereas interests are the underlying concerns that helped form the position. For example, a group's position could be that they want to ban new industries from being allowed to directly discharge to a Region of Concern, while their interest is restoring a viable recreational fishery (Fisher and Ury 1991).

Planning processes can deteriorate at this early stage because people may try to alter or question other stakeholder interests or because they do not have the patience to spend a few hours or a day identifying and understanding interests. If the team moves through this step efficiently, however, participants will have valuable information for later in the process. When negotiating recommendations, for example, it is necessary to consider the relationship between a stakeholder's position and his or her interests. If the position a stakeholder chooses threatens team consensus, team members should consider whether the position is consistent or inconsistent with the stakeholder's interests. If it is inconsistent, team members should ask the stakeholder to consider whether his or her interests can be satisfied in a different way. For example, if a stakeholder's position is that it is necessary to ban new industries from directly discharging to the Region of Concern but their interest is in restoring a recreational fishery, perhaps the interest could be achieved through a means other than a ban (e.g., modification of existing NPDES permit limits to be more stringent). This kind of situation underscores the importance of understanding stakeholder interests early in the process.

During each Regional Action Team meeting, information such as stakeholder interests, common interests, and conflicting interests, as well as the agenda for the next meeting, should be recorded on flip charts and distributed as notes between meetings.

### **3.2.2 Evaluating Environmental Problems and Establishing a Vision Statement, Goals and Objectives**

The early stages of the regional action planning process should focus additional investigations on priority problems. An effective Regional Action Plan will be streamlined and targeted on the primary sources of chemical contamination identified as contributing to priority problems. In order to prioritize problems for

During this initial problem identification stage, the team and lead agency could sponsor activities to educate and seek input from the public at large on the nature and scope of the identified problems. These activities should include public workshops, roundtable discussions, and citizen surveys, such as mail or telephone surveys to assess the public's awareness and perceptions of the issues involved.

action, the Regional Action Team must have a sense of the vision, goals, and objectives it hopes to achieve in the Region of Concern. The process of identifying and prioritizing problems, including sources, and determining a vision statement, goals, and objectives is iterative—as the Regional Action Team develops its information base on problems, goals and objectives might become apparent. Likewise, achievement of goals and objectives might clearly require focus on specific problems and chemical sources.

The Regional Action Team should be involved in all phases of the decision-making processes to identify and prioritize problems, including chemical contaminant types and contributing sources. The team is also integral in establishing the plan's vision statement, goals, and objectives. The results of this process will not only guide plan development, but will provide much of the written portion of the final plan. Early consensus by the team on these topics can be developed from a general understanding of the problem (i.e., why the area was designated as a Region of Concern), supported by readily available information, including written materials (e.g., newspaper articles, research documents, and other technical reports), consultation with individuals familiar with the Region of Concern, and materials acquired and generated by the Chesapeake Bay Program when identifying the particular Region of Concern. This base level of information will provide the necessary background needed to stimulate the team to further characterize the problem and begin establishing goals. In addition to participating in the decision-making, the team is expected to evaluate materials and provide technical support, as necessary. Chapters 4 and 5 of this guidance document provide more detailed information on establishing the plan's vision statement, goals, and objectives (Chapter 4) and evaluating environmental problems (Chapter 5).

### **3.2.3 Evaluating Existing Management Programs**

The most successful actions to reduce the impacts of chemical contamination in Regions of Concern are often developed by evaluating and modifying existing approaches. Therefore, the thorough evaluation of existing management programs, including regulatory and nonregulatory approaches (e.g., NPDES permit compliance, pollution prevention) is an important and essential prerequisite for developing an implementation approach. The Regional Action Team should play an integral role in identifying and evaluating existing management programs.

Chapter 6 of this guidance defines an approach for evaluating existing management programs. The lead agency would likely spearhead these evaluations, supported by Regional Action Team members. The investigations must include an assessment of regulatory and nonregulatory approaches and activities taken by government agencies and non-governmental organizations. A well-selected Regional Action Team could provide the majority of information needed for these investigations. It is expected that Regional Action Team members representing different stakeholder groups (e.g., government, industry, environmental organizations) could report on key programs and/or provide a list of additional contacts for consultation. The Regional Action Team would also determine the criteria to guide the evaluation (i.e., the basis for measuring effectiveness). Once the evaluation is complete, the Regional Action Team would review the results, determine if additional investigations were needed, and consider which existing management measures should be considered as potential implementation actions.

**3.2.4 Determining Implementation Actions**

The ultimate effectiveness of a Regional Action Plan hinges on developing effective implementation actions. Chapter 7 of this guidance outlines a procedure to identify and select implementation actions. The Regional Action Team plays a critical role in determining these actions. Because of their importance in determining overall plan effectiveness, it is essential that sufficient time be allocated to identify, research, and rank potential implementation actions; generally, the Regional Action Team needs at least 2 full meeting days to evaluate and select implementation actions.

Although the lead agency may assemble the background materials needed to evaluate potential actions, the Regional Action Team will be involved in most steps of the process—brainstorming about potential actions, providing background information, volunteering to conduct additional research if needed, and developing criteria to evaluate the suitability of actions.

One of the first steps involves developing an organized inventory of potential implementation actions. The facilitator/team leader should first poll the team on suggested approaches for organizing actions. To do this, it may be appropriate for the team to review the purpose of the Regional Action Plan and to structure the actions accordingly (e.g., by pollution source category).

Once the team identifies a loose structure for the implementation actions, team members should "brainstorm" to identify actions within each category (e.g., point source actions, nonpoint source actions, actions directed at urban areas, actions directed at marinas). The team should develop as many actions as possible without judging them. When developing actions, it is important for the team to be innovative and creative in attempting to address stakeholder interests. In addition, it is important to carefully evaluate existing management approaches in the Region of Concern, as well as proposing new ones. It is especially important to consider existing laws and policies; a priority of the planning process should be to evaluate compliance and enforcement effectiveness. The team should also identify gaps in existing laws, programs, and policies so that effective new solutions can be developed.

After developing a list of potential implementation actions (this may take a few meetings), the Regional Action Team must further refine and organize these options. The team may want to establish specific criteria, such as technical feasibility, cost, financing, and public acceptability, to determine whether an action is appropriate and, therefore, a candidate for further evaluation (see Chapter 7). The Regional Action Team should work closely with the lead agency to identify evaluation criteria. These criteria must be well understood by all team members. Although each Regional Action Team may

develop its own evaluation criteria, it is important that the selected criteria enable the team to narrow its comprehensive list of potential actions to a manageable size for further consideration.

Regional Action Team members or subgroups/workgroups of the Regional Action Team, working with the lead agency, can be charged with further evaluating and defining promising actions between team meetings. Meetings will be more productive and time efficient if the team members have this background information prior to the meetings.

During this phase, the Regional Action Team should also evaluate implementation actions with respect to identified stakeholder interests. The team should try to move toward the action that best meets its diverse interests, reminding stakeholders that the option is probably better than the alternatives that would result if an agreement could not be reached.

Strong leadership is essential to timely and complete closure on an issue. Closure entails a full and accurate transcription of recommendations and commitments, as well as assurance that each commitment can be fulfilled. Recommendations should be as thorough as possible and should be related to specific evaluation criteria. The Regional Action Team should work with the lead agency and other responsible groups to ensure that final implementation actions are fully described and address the following questions:

- Who is responsible for implementation?
- What actions are necessary to implement the plan?
- Where should the implementation activities be targeted?
- When should actions be taken?
- How should actions be implemented?

The team should organize its final recommendations into the format of the Regional Action Plan. The lead agency (and responsible agencies, if possible) should be prepared to assist the team in compiling the plan. The draft plan, including implementation actions, should be made available to the team for review and comment before submittal to the general public and any governing agency (e.g., Chesapeake Executive Council) for review, comment, and adoption.



### **3.3 DEVELOPING A WORK PLAN**

It is important that the approach to regional action planning and consensus-building be established near the beginning of the planning process, ideally before the first meeting of the Regional Action Team, so that it can be thoroughly described to all participants in the planning process. In addition, the roles and responsibilities of the lead agency, team leaders, team members, and other participants (e.g., a facilitator) should be clarified.

Frequently, planning activities, including stakeholder meetings to build consensus, suffer from a lack of focus and an unspecified game plan. A perception of disorganization and a lack of clearly defined goals and objectives can severely hurt the regional action planning process and the development of an implementable plan. In the early stages of the regional action planning process, it is important to clarify the overall purpose of the planning activities, identify an approach to the planning process, determine a schedule and planning milestones, and define the roles and responsibilities of participants. The lead agency, in conjunction with an existing stakeholder group (if applicable, should the lead agency choose to delegate some or all of its authority to such a group), and Regional Action Team leaders, may want to draft a work plan to guide the planning process. At a minimum, the work plan should:

- Provide an overview of the approach that will be used to conduct the planning process (e.g., use of a professional facilitator, methods used to make decisions and build consensus)
- Identify roles and responsibilities for the planning process
- Outline potential meeting agendas, including anticipated decision points, for the Regional Action Team
- Present a schedule for planning activities (e.g., proposed meetings, draft materials, and plan completion).

A work plan provides the basis, or road map, for the regional action planning process. It ensures that all participants understand the anticipated process from the beginning, and contains a schedule to keep the process moving in a timely manner. The work plan is intended to serve as a guide only—it is not cast in stone, and should be reviewed throughout the process and revised as necessary. Exhibit 3-8 highlights selected activities that should occur during the development of the Regional Action Plan and should be addressed in the work plan. These activities are tied to hypothetical Regional Action Team meetings. The exhibit presents information on proposed agendas for each meeting, as well as suggestions for background materials needed to prepare the Regional Action Team for the meeting and suggestions for products/outcomes to be generated from the meetings. This information is presented as guidance and

**Exhibit 3-8. Overview of Activities Comprising the Regional Action Planning Process**

Meeting #1
<p><b>Materials Distributed in Advance</b></p> <ul style="list-style-type: none"> <li>• Agenda</li> <li>• List of team members</li> <li>• Background materials (summary materials describing planning process, Region of Concern; draft work plan; fact sheet summarizing existing information on problems; draft language on vision statement, preliminary goals and objectives)</li> </ul> <p><b>Suggested Agenda Topics [Responsible Party]</b></p> <ul style="list-style-type: none"> <li>• Welcome [Lead Agency]</li> <li>• Introductions, including statement of participant's interests, and personal goals and objectives for the process [Team Leaders]</li> <li>• Background Presentations <ul style="list-style-type: none"> <li>- Overview of the Planning Process [Lead Agency]</li> <li>- Roles and Responsibilities [Lead Agency, Team Leaders]</li> <li>- Preliminary assessment of problems [Lead Agency, Invited Speakers]</li> <li>- Overview of existing activities, including assessment of current actions by representative stakeholders (e.g., success stories) [Lead Agency, Invited Speakers]</li> <li>- Meeting ground rules [Lead Agency, Facilitator]</li> </ul> </li> <li>• Present work plan and describe approach for Regional Action Team. [Lead Agency, Team Leaders] <ul style="list-style-type: none"> <li>- Procedures (e.g., use of a facilitator; development of background papers)</li> <li>- Roles and responsibilities</li> <li>- Desired final product</li> <li>- Anticipated schedule</li> </ul> </li> <li>• Seek agreement on work plan and team approach. [Lead Agency, Team Leaders]</li> <li>• Discuss need for public participation. Seek volunteers to develop public participation strategy. [Lead Agency, Team Leaders]</li> <li>• Review presentations and other existing background information on problems with goal of beginning prioritization. If materials are distributed in advance of meeting (at least one week), it may be appropriate for group to reach facilitated consensus on problem statement and prioritization of problems for consideration. If advance distribution is not possible, use meeting to introduce materials and prepare Regional Action Team for next meeting. [Team Leaders, Facilitator]</li> <li>• Present draft language on vision statement, preliminary goals, and objectives. If distributed in advance of meeting (at least 1 week), it may be appropriate for group to reach facilitated consensus on preliminary goals and objectives. If advance distribution is not possible, use meeting to introduce materials and prepare Regional Action Team for next meeting. [Team Leaders, Facilitator]</li> </ul> <p><b>Products To Be Generated From Meeting</b></p> <ul style="list-style-type: none"> <li>• Problem definition and prioritization (if materials distributed in advance and adequate time allowed to discuss)</li> <li>• Vision statement, preliminary goals and objectives (if materials distributed in advance and adequate time allowed to discuss)</li> <li>• Summary of participants interests and desired outcomes</li> <li>• Finalized work plan</li> <li>• Meeting evaluation</li> </ul>

### Exhibit 3-8. Overview of Activities Comprising the Regional Action Planning Process (continued)

#### Meeting #2

##### *Materials Distributed in Advance*

- Agenda
- Meeting highlights
- Background materials (background reports on sources of problems, existing management approaches)

##### *Suggested Agenda Topics*

- Conclude unfinished business from previous meetings. [Team Leaders]
- Seek consensus on problem definition and prioritization. [Facilitator]
- Seek consensus on preliminary goals and objectives. [Facilitator]
- Present more detailed problem definition, including chemicals of concern and sources of concern. Present evidence, to date, linking sources to problems. If evidence is sufficient, and/or if team has had time to review materials, begin to prioritize sources for action. Develop criteria for identifying priority sources.<sup>1</sup> [Team Leaders, Lead Agency, Facilitator, Invited Speakers]
- Present results of evaluation of existing management measures. [Team Leaders, Lead Agency, Facilitator, Invited Speakers]

##### *Products To Be Generated from Meeting:*

- Products that must be completed from first meeting:
  - Final problem definition and prioritization
  - Vision statement, preliminary goals and objectives
- Preliminary ranking of priority source categories.
- List of action items for next meeting.
- Meeting evaluation.

#### Meeting #3

##### *Materials Distributed in Advance*

- Agenda
- Meeting Highlights
- Background materials (final report summarizing sources of chemical contamination; preliminary list of implementation actions based on preliminary ranking of source categories).

##### *Suggested Agenda Topics*

- Conclude unfinished business from previous meetings. [Team Leaders]
- Present additional information linking sources of chemical contamination to priority problems. Discuss sources of chemical contamination. Develop final ranking of sources based on evaluation criteria. [Team Leaders, Lead Agency, Invited Speakers, Facilitator]
- Evaluate preliminary goals and objectives. Modify as needed to reflect new information. [Facilitator, Team Leaders]

<sup>1</sup>It is important to remember that the Regional Action Plan's ultimate goal is to present an implementation approach for addressing problems caused by chemical contamination in a designated Region of Concern. The analyses conducted for the planning process should always bear this goal in mind so that limited resources can be utilized effectively. It is useful to streamline the planning approach by focusing on priority problems and sources of problems. Once priority problems and sources are identified, further investigations should be focused on those areas.

### Exhibit 3-8. Overview of Activities Comprising the Regional Action Planning Process (continued)

#### Meeting #3 (continued)

- Review work plan. Determine if work plan needs to be modified. [Facilitator, Team Leaders]
- Report of approach and results for identifying implementation actions.<sup>2</sup> [Lead Agency, Team Leaders, Invited Speakers]

#### *Products to Be Generated from Meeting*

- Final ranking of priority source categories
- List of action items for next meeting
- Meeting evaluation.

#### Meeting #4

#### *Materials Distributed in Advance*

- Agenda
- Meeting highlights
- Background materials (reports presenting comprehensive list of implementation actions by source category, including qualitative information needed to evaluate and prioritize actions)

#### *Suggested Agenda Topics*

- Conclude unfinished business from previous meetings. [Team Leaders]
- Present research on implementation actions. [Lead Agency, Team Leaders, Invited Speakers]
- Select implementation actions to be pursued further. [Lead Agency, Team Leaders, Invited Speakers]

#### *Products To Be Generated from Meeting*

- Short list of implementation actions to be evaluated in more detail.
- Meeting evaluation

#### Meeting #5

#### *Materials Distributed in Advance*

- Agenda
- Meeting Highlights
- Background materials (final report on implementation actions, outline and materials prepared to date for final plan)

#### *Suggested Agenda Topics*

- Conclude unfinished business from previous meetings. [Team Leaders]
- Review status of implementation actions. Seek implementation commitments. [Team Leaders, Invited Speakers, Facilitators]
- Discuss presentation of final plan (it is appropriate throughout the planning process for the lead agency and/or a drafting subcommittee from the Regional Action Team to prepare draft chapters of the plan for distribution, review, and comment). [Team Leaders, Lead Agency]
- Determine schedule for additional meetings, if necessary. [Team Leaders]

#### *Products to Be Generated from Meeting*

- Approach, including assigned responsibilities, for preparing final plan and securing commitments for implementation actions.
- List of remaining action items and next steps.
- Meeting evaluation.

<sup>2</sup>When developing implementation actions, it is important to focus on priority problems and sources. Also, the level of detail needed in the assessment should be limited to that required for sound decision-making (e.g., a qualitative analysis may be all that is needed for the purpose of narrowing list of potential implementation actions to those that should be pursued in more detail for the final plan). Excess analysis should be avoided.

should be modified to suit the unique needs of the Region of Concern. As discussed in more detail in Section 3.4, it is important to set aside sufficient time during the meetings to adequately cover each agenda topic.

### **3.4 CONDUCTING EFFECTIVE REGIONAL ACTION TEAM MEETINGS**

Successful regional action planning depends largely on effective stakeholder involvement so that parties affected by and contributing to chemical contamination problems in the Region of Concern feel an important part of the process, gain a sense of ownership to the plan, and commit to the proposed implementation actions. Since the Regional Action Team is the main forum for involving stakeholders, it is important to conduct effective Regional Action Team meetings. The efficiency and effectiveness of Regional Action Team meetings depends on an organized approach with clearly defined roles and responsibilities for all participants, a well-planned meeting schedule that accounts for all phases of plan development, and clearly articulated meeting agendas and approaches to developing the plan. Without these elements, the chances of conducting a successful regional action planning process are greatly reduced, as:

- Confusion over roles and responsibilities may result in a duplication of efforts and/or gaps in responsibilities.
- Meetings may lose focus, become rambling discussions, or are side-tracked, so that concrete action items are not developed.
- Participants may become disinterested and discouraged because they feel that they are not accomplishing anything (not a part of the process) or they lose sight of the overall purpose and end goal of the planning process.
- The resulting plan may lack focus and/or may not adequately represent stakeholder groups.

It is important to ensure that the overall meeting schedule, and individual meeting agendas, allow enough time for the consensus-based process to occur. The Regional Action Team must reach consensus on many issues throughout the planning process—vision statement, goals, and objectives; problem definition and prioritization; and implementation action selection. In order for the team to feel a legitimate part of the planning process, it is necessary for them to have time to review background materials, formulate their ideas, and discuss their opinions in a facilitated process. The amount of time needed for these activities varies, depending on the complexity of issues being addressed and the size of the Regional Action Team. In general, a facilitator needs at least 2 to 3 hours per issue (e.g., identifying goals and objectives) to effectively work with the Regional Action Team. The length of each team meeting should

be adjusted to reflect the number of issues being addressed. In many situations, it works well to have the Regional Action Team meeting run from mid-morning to early afternoon (e.g., 10:00 a.m. to 3:00 p.m.), with a break for lunch. This structure enables the morning session to cover background material, gives the team members time to discuss information and formulate opinions during the lunch break, and saves sufficient time for facilitated decision-making in the afternoon. The lead agency and team leaders should work closely with the facilitator to block off appropriate amounts of time for each topic.

The importance of clearly defining meeting roles and responsibilities, in terms of who is responsible for which parts of the meeting and how the meeting will be conducted, cannot be overemphasized. An effective Regional Action Team meeting must have a designated team leader or co-leaders and a balanced and representative group of participants (i.e., team members) representing key stakeholders. In addition, it is recommended that a facilitator conduct portions of the meeting and a meeting recorder provide notetaking and other support for the meeting. The appropriate roles and responsibilities for participants in Regional Action Team meetings (i.e., team leaders, team members, lead agency, facilitator, and recorder) are defined in Exhibit 3-9. The lead agency can remain active in the planning process by providing technical support and/or facilitation expertise, if possible. Frequently, it helps to have an outside facilitator to build trust among all meeting participants, so they do not perceive a hidden agenda. For this reason, it is also advisable that the Regional Action Team leader(s) be someone other than the lead agency. However, the lead agency is a valid stakeholder in the planning process and should appoint a member to the Regional Action Team.

Just as it is important to have clearly defined roles and responsibilities among planning participants, it is also necessary to have clearly articulated meeting agendas and approaches. The lead agency, its partner or designee (e.g., existing groups), team leaders, and the facilitator should work together to develop effective meeting agendas and approaches. Sometimes this process can be guided through the joint development of a work plan to guide the planning process (see Section 3.3). Regional Action Plans are developed from the evaluation of different types of information, as well as substantial input from the Regional Action Team and the general public. To effectively synthesize the information in a timely and efficient fashion and to ensure that all parties are adequately represented requires an organized meeting approach. Without an organized approach, meetings and/or the planning process can get side-tracked, result in time-consuming, unfocused discussions, and potentially not achieve the goals of the planning process.

**Exhibit 3-9. Roles and Responsibilities—Regional Action Team Meetings**

<b>Team Leader or Co-Leaders</b>
<ul style="list-style-type: none"> <li>• Establish meeting objectives and plans and are responsible for the overall direction of the meeting</li> <li>• Clarify participants' roles and responsibilities</li> <li>• Start meeting on time</li> <li>• Provide introductions, summarize meeting objectives and agenda items, and define roles and responsibilities</li> <li>• Work with facilitator to ensure meeting agenda is followed in a timely manner</li> <li>• Participate as group members</li> <li>• Summarize key decisions and actions</li> </ul>
<b>Team Members</b>
<ul style="list-style-type: none"> <li>• Generate ideas, analyze information, provide technical input, make decisions, and implement action plans</li> <li>• Review agenda and other meeting materials before attending meetings</li> <li>• Conduct enough pre-meeting background research to participate effectively in the meeting</li> <li>• Know purpose of meeting ahead of time and do "homework" if necessary to prepare</li> <li>• Confirm attendance and delegate an alternate if cannot attend</li> <li>• Attend meeting on time</li> <li>• Keep an open mind, avoid premature judgment, and try to understand other perspectives</li> <li>• Help facilitator eliminate distractions and encourage active involvement</li> <li>• Speak up; share useful ideas</li> <li>• Support ground rules and other meeting guidelines</li> <li>• Participate in a timely fashion</li> <li>• Volunteer for tasks only if capable of following through</li> <li>• Agree to participate in consensus-building exercises</li> </ul>
<b>Lead Agency</b>
<ul style="list-style-type: none"> <li>• Provides technical and financial support</li> <li>• Schedules meetings</li> <li>• Prepares draft agenda</li> <li>• Provides background materials for the meeting</li> <li>• Participates as a team member</li> </ul>
<b>Facilitator</b>
<ul style="list-style-type: none"> <li>• Manages how people work and communicate in the meeting</li> <li>• Is responsible for flow of the meeting</li> <li>• Coordinates with Regional Action Team leaders and lead agency to acquire any needed background or other preparatory information</li> <li>• Reviews planned agenda and action items</li> <li>• Ensures meeting runs smoothly</li> <li>• Reviews team's ground rules</li> <li>• Focuses the group</li> <li>• Monitors and regulates participation</li> <li>• Evaluates effectiveness of process and suggests alternative methods and processes as necessary</li> <li>• Protects people from "attack" and deals with problem people</li> <li>• Remains neutral at all times, particularly during disagreements</li> </ul>
<b>Recorder</b>
<ul style="list-style-type: none"> <li>• Keeps track of important information throughout the meeting, prepares flip charts and other necessary visual aids during the meeting, and prepares post-meeting summaries and action items.</li> <li>• Prepares necessary meeting summaries, highlights, and other materials.</li> <li>• Captures ideas visually without editing or paraphrasing.</li> <li>• Checks to ensure that appropriate information has been recorded; obtains clarification from the participant if needed.</li> <li>• Helps leader and facilitator keep track of information.</li> <li>• Produces meeting summaries, highlights, and other materials.</li> </ul>

Source: Adapted from Chang and Kehoe (1994)

Many references exist that summarize the elements of productive meetings, including preparing the meeting, conducting the meeting, and evaluating the meeting (Chang and Kehoe 1994; Doyle and Straus 1976; Fisher and Ury 1991). Exhibit 3-10 summarizes some basic considerations for conducting effective meetings in the context of regional action planning.

**Exhibit 3-10. Basic Considerations for Conducting Effective Regional Action Team Meetings**

- Determine appropriate participants (e.g., subject matter experts, key decision-makers, and affected parties, not unaffected parties and known meeting "disrupters").
- Ensure continual and balanced representation. Primary team member should select alternate if he/she cannot attend.
- Clearly define and reach agreement on roles and responsibilities for all meeting participants, including meeting leaders, meeting facilitator, recorder, Regional Action Team members, and lead agency. Define and maintain roles and responsibilities from the beginning to end of the process.
- Fully consider each stage of meeting development: (1) Preparing for the meeting, (2) Conducting the meeting, and (3) evaluating the meeting. No stage should be ignored or minimized.
- Develop a well-thought out agenda providing the following information: meeting objectives, logistics, anticipated attendee list (defining leader, facilitator, recorder), roles and responsibilities, action items (i.e., list of items that must be covered to achieve meeting objectives), and allocated time.
- Reach agreement on approach to planning process, including meeting schedules, ground rules, and guidelines.
- Distribute necessary background materials to meeting participants sufficiently in advance of the meeting
- Keep meetings focused on priority issues. When making decisions, develop a variety of options from which to prioritize using a consensus-based set of objective evaluation criteria.
- Allow sufficient time to cover the subject adequately and build consensus, if necessary.
- Avoid getting bogged down in details. Investigations are designed to support the development of sound implementation actions. Detail beyond that needed for the purpose of developing implementation actions may be superfluous.
- Ensure open and balanced participation from all participants.
- Strive toward consensus-based decision-making.
- Produce meeting summaries and progress reports to ensure that the overall planning process remains focused toward its end goal.
- Evaluate the meeting to ensure that participants are satisfied with the approach.

Sources: Chang and Kehoe (1994); Fisher and Ury (1991); Chechile and Carlisle (1991); Doyle and Straus (1976)



### **3.5 APPROACHES TO BUILDING CONSENSUS**

An effective Regional Action Plan will be developed using a consensus-based process involving major stakeholders represented through the Regional Action Team. This type of process, which ensures that all parties are heard and the actions are not dictated, but mutually agreed upon, typically leads to a greater sense of ownership to the plan, commitment to its recommendations, and a better chance that it will last over the long run. There are many techniques that can be used to develop plans based on a consensus-approach, depending on the size of the group involved and the particular situation in the Region of Concern. As mentioned previously, the optimal group size for this type of process is no more than 7 to 15 participants; if more people are needed, it may be necessary to break into smaller subgroups.

In an ideal planning situation, a trained facilitator (especially one having some technical familiarity with the issues facing the Region of Concern) will provide the skills needed to guide the Regional Action Team. If it is not possible for the Regional Action Team to have a professional facilitator, the team leader, or someone from the lead agency, could perform these duties if the team agrees to that approach and the chosen facilitator is able to remain objective. Alternatively, the lead agency may want to offer facilitation training as part of its overall technical assistance to the regional action planning process. Many organizations offer facilitation services and/or training. Regardless of the approach used to obtain a facilitator, care should be taken in the selection process because the facilitator has a great deal of influence on the overall success of the planning process. Selection criteria include experience with similar planning situations, familiarity with a variety of approaches used to build consensus, familiarity with the ground rules and procedures to conduct efficient meetings, enough technical background to have some familiarity with Region of Concern issues, experience working with groups of a similar size and composition, and ability to remain neutral (not representing any interests).

While it is beyond the scope of this document to provide a thorough discussion of the consensus-building approach to decision-making, two key elements are essential (Fisher and Ury 1991; Doyle and Straus 1976):

- Generating a wide variety of possibilities and alternatives before making a decision
- Measuring the possibilities against previously agreed upon, objective evaluation criteria to determine final outcome.

When evaluating candidates for the facilitator's role, it would be useful to ensure they have familiarity with this kind of approach.

Facility-based pollution prevention planning provides one example of using this approach. Typically, the facilities determine at the outset of the planning process the environmental problems or issues of greatest concern. Using those priorities as the basis for further investigations, the facilities identify a broad range of pollution prevention opportunities that will address targeted environmental problems. This broad list of opportunities is then compared against predetermined evaluation criteria (e.g., liability, regulatory compliance, implementation considerations, costs, environmental impacts) to determine final choices (Chechile and Carlisle 1991; Gaunt et al. 1994; SAIC 1993). Chapter 7 and Appendix D of this guidance document provide more information on decision-making using evaluation criteria.

In order to provide effective input to the planning process, participants need to have enough background information to form the basis for sound decision-making. Ideally, Regional Action Team members will have some technical familiarity and understanding of the issues concerning a Region of Concern. The preparation of background materials in advance of planned meetings can also help. An approach that was effective in conducting the Chesapeake Bay Program's Nonpoint Source Evaluation Panel (Chesapeake Bay Program 1990) is briefly summarized below and may be applicable to the regional action planning process:

- **Identify topics for investigation**—Overall purpose of the planning process is defined by Lead Agency and Regional Action Team, and discrete topics needing additional information are identified. For example, the Regional Action Team may want to learn more about the effectiveness of existing management approaches.
- **Prepare background and options papers**—Lead agency (or volunteers from the Regional Action Team) prepares background materials (e.g., short overview papers) on identified topics. In addition, options papers, outlining specific choices the group may want to use as the basis for its decision-making process, may be prepared. For example, the background paper would summarize the effectiveness of existing management programs, while the options paper would make suggestions on ways to modify/improve the existing programs. Suggestions made in the options paper could be included by the Regional Action Team as potential recommendations in the final plan. Background and options papers should be distributed to team members in advance of the planned meeting so they can have time to review the information (e.g., at least 1 week). The background and options papers may also be supplemented by a presentation at the meeting.
- **Facilitate decision-making**—Using the background and options papers as the basis for dialogue at the meeting, a facilitator guides the group through a consensus-building process to reach agreement on choices (e.g., which options paper recommendations to include in the final plan).
- **Prepare plan**—Using the decision-points generated from the options papers, supplemented by additional input, the lead agency, or a subcommittee of the Regional Action Team,

prepares sections of the final plan. Each section, and the completed draft plan, are distributed to the group for review, comment, and approval.

The length of time for this process obviously varies depending on the situation. It is necessary to give team members adequate time to review materials before the scheduled meetings, so drafts should be distributed at least a week in advance. As well, it is important to allocate sufficient time at the meetings to fully discuss issues and reach consensus. It may be necessary to discuss some issues over the course of several meetings. As outlined in Exhibit 3-8, the regional action planning process should plan on at least the following schedule (Note: Schedule assumes meetings will be conducted for most of a day [e.g., 10:00 a.m. to 3:00 p.m.]):

- Defining vision, goals, and preliminary objectives—One early meeting, but to be modified and refined throughout the process
- Developing a problem statement—One meeting
- Reviewing the efficacy of existing measures—Half of a meeting to one meeting. Could be coupled with a preliminary overview of proposed implementation actions.
- Developing implementation actions—At least two meetings.

### **3.6 PUBLIC PARTICIPATION AND EDUCATION**

A public participation and education program should be implemented throughout the regional action planning process. The Regional Action Team, in conjunction with the lead agency, should take responsibility for defining a public participation approach. Because the Regional Action Team may be consumed with developing the Regional Action Plan, a subset of the team, or a new group designated by the Regional Action Team and/or lead agency, should take responsibility for involving the public. In addition, the Regional Action Team should include ongoing public participation and education as an implementation action for the Regional Action Plan.

The public participation and education program recommended for regional action planning is different from, and moves beyond, stakeholder involvement on the Regional Action Team. Although specific segments of the public are represented on the Regional Action Team, the extent and level of public participation envisioned for the regional action planning process is much broader than the representation provided by the Regional Action Team. In addition, the roles and responsibilities of the Regional Action Team are very different than what is needed for public participation and education. The Regional Action Team is a small group tasked with developing a Regional Action Plan, whereas the

public participation and education approach is intended to build support for the Plan's implementation by informing and enthusing the general public about the Region of Concern.

The public includes all citizens who live in the area—those represented by specific stakeholder groups (e.g., Regional Action Team, civic groups, business associations, environmental organizations) and citizens who may not be so represented (e.g., homemakers, subsistence fishers). Some examples of specific sectors of the public that should be included in a public participation and education approach are private businesses, homeowners associations, garden clubs, civic groups, schools and colleges, churches, educational nonprofit organizations, and groups that represent racial and ethnic minorities. The broad involvement of these groups is necessary to ensure successful plan implementation. Only when the public understands and embraces the plan, will they be able to support implementation.

The importance of including the general public cannot be overemphasized. Public involvement is a critical link between plan development and implementation. During this era of severe constraints on both government and private sector funding, recognizing the value of the public as a resource is essential to achieving the goals and objectives of Regional Action Plans. Likewise, public involvement in planning will generate more commitment and volunteerism during implementation. An educated and motivated public can provide much of the expertise, time, effort, and leadership needed to protect and monitor the Region of Concern. Two factors are crucial for encouraging public involvement: (1) education about the Region of Concern, including how the individual is a part of the problem and solution, and (2) inclusion in the planning process, even if it is just to be kept informed. People work for that which they understand and are committed, and people are committed to that which they help create. The public's talents, energy, and technical and financial resources can be a cost-effective way of solving many of the Region of Concern's problems.

One of the cornerstones of successful action planning efforts is the building of coalitions among government agencies, parties affected by or contributing to problems in the Region of Concern, and an informed, committed general public. Citizens are important in keeping the regional action planning process focused and moving towards its goals. As well, citizens groups may be active participants in the process—serving as watchdogs, conducting volunteer cleanup and monitoring activities (e.g., schools and churches can sponsor an "adopt a watershed" program, contribute to "Bay or river watch" computer bulletin boards, or help with a speaker's bureau and with periodic conferences and workshops). The resident of a Region of Concern will work harder to secure his or her own future than other, more transient entities (e.g., distant government employees) (Hartig and Zarull 1992; Law and Hartig 1993).

Because the development and implementation of Regional Action Plans is a long-term, ongoing process, continued public involvement and a long-term commitment to regional action planning is essential.

Continued effective involvement can only be maintained, however, if all participants are convinced that the time spent on regional action planning is productive. If the public does not see short-term progress in remediation, they may become disillusioned and abandon the process. Short-term, focused projects must be organized that are of interest to and achievable by the public. Building a record of such successes is one mechanism of sustaining public involvement.

Two important components to any public participation program are to define the elements of effective public participation and to design a public participation program that will produce the support needed for Regional Action Plans. Critical elements to every public participation program are trust, communication, opportunity, and flexibility (Law and Hartig 1993). Trust must be established between those directly involved in the regional action planning process and the public. Although it is the most difficult of the four elements to attain, trust is also the most essential element in a successfully implemented Regional Action Plan. To establish *trust* the following must occur: *communication* must be open between participants, *opportunities* must exist for public input, and *flexibility* must be maintained in the planning process to accommodate both new information and necessary changes in the program.

To build broad-based community support, effective public participation in the regional action planning process should be encouraged throughout the entire planning process. Public involvement should be initiated at the outset of the planning process with the distribution of information (e.g., press releases, public meetings) about the planning process, including goals and objectives, approach, and timeframes and milestones. Opportunities for continued public involvement should also be outlined at that time. Actions to inform and involve the public should occur throughout the life of the planning process, especially at critical stages, such as defining the problems, developing goals and objectives, and brainstorming about implementation actions. The public should also be involved in monitoring the Plan's implementation until restoration is complete. It is not intended that the public become part of the Regional Action Team. Rather, the public participation and education approach provides opportunities for the general public to provide input to the Regional Action Team. Such citizen involvement will provide the Regional Action Plan with invaluable local knowledge, the continuous and vigorous public oversight needed to overcome bureaucratic inertia, and the political will accomplish goals and objectives (Hartig and Zarull 1992; Law and Hartig 1993).

To maximize its effectiveness, the public outreach should compliment existing user groups and avoid costly duplication of other groups' efforts. The Regional Action Plan's public participation programs most useful role may be coordinating between and filling gaps in existing programs. There are many ways to achieve these objectives; however, the following scenario is presented for example. First, the Regional Action Team or its public participation subgroup should identify the Regional Action Plan's educational priorities. Second, existing public education and outreach programs in the Region of Concern should be surveyed. This investigation may demonstrate that many public and private groups in the Region of Concern are addressing issues that the Regional Action Plan deems important. Once the list of major education organizations is compiled, the list can be analyzed for specific geographic areas or focus on a specific issue. The Regional Action Plan represents many interests throughout the Region of Concern and may serve a unique role as coordinator of a network of complementary, overlapping interests. Gaps of information can be filled by sharing and disseminating information and resources.

Not all user groups are the same and the Regional Action Plan should determine the audience's level of knowledge and involvement with the Region of Concern. The Regional Action Plan's public participation program should provide a foundation for a true understanding of issues related to the Region of Concern. Accordingly, the public participation program should devise a public education strategy that provides for different levels of involvement. First, the Regional Action Plan may promote existing programs. Second, the Regional Action Plan may seek to change existing programs or broaden their focus to incorporate Regional Action Plan messages. Third, the Regional Action Plan should encourage the creation of new programs when appropriate. For example, if another group is addressing an issue adequately, the Regional Action Plan may help to promote and publicize its efforts. Whereas, if a second group needs financial or logistical assistance, the Regional Action Plan may try to provide the resources necessary for the group to organize its work. As a last resort, if the Regional Action Plan identifies an educational need that no one else is addressing, then the Regional Action Plan should initiate a new program.

Once it defines areas needing additional involvement, the team should implement a range of public participation and education tools. In addition, the team should coordinate with any existing communications activities that support the Chesapeake Bay Program. Throughout the planning process, the public should be given regular updates through newsletters, fact sheets, and press releases. It is important to communicate possible planning options to the public before they are narrowed or selected. It may also be appropriate to publish a newsletter for each Region of Concern. Team members should periodically speak to organizations that represent sectors of the general public. Among other activities,

the team should establish contacts with the media and encourage regular stories and news clips. The media should be encouraged to take responsibility for educating the public at large by contributing staff and other resources to educational video spots and public service announcements, along with other actions. Depending on the public's involvement in the Region of Concern, it may be useful to consider establishing a nonprofit organization that could promote public education and participation during plan development and implementation or to build upon the efforts of an existing organization.

**Public Participation and Education Tools**

- Public meetings and hearings
- Public workshops and forums
- Public roundtables
- Speakers' bureau
- Outreach to schools, such as teachers' guides and curricula
- Citizen surveys
- Citizen monitoring and/or watchdog groups
- Newsletters, videos, and television programs
- Annual progress reports
- Computer bulletin boards
- Nonprofit educational groups
- Cleanup days and other special events

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**CHAPTER 4**

**DEFINING THE PLAN'S VISION, GOALS,  
OBJECTIVES, AND MILESTONES**

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## **CHAPTER 4**

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## **CHAPTER 4. DEFINING THE PLAN'S VISION, GOALS, OBJECTIVES, AND MILESTONES**

The successful development and implementation of Regional Action Plans depends, in part, on having an overall vision and clearly defined and measurable goals and objectives. Many comprehensive planning efforts, such as Great Lakes remedial action planning, have found that establishing an articulated long-term vision statement at the beginning of the planning process is an important prerequisite for the subsequent definition of goals and objectives (Hartig et al. 1994; Hartig and Zarull 1992). Once an overall vision for a Region of Concern is determined and agreed upon by all significant stakeholders (represented by the Regional Action Team), the process of establishing goals, objectives, and milestones becomes more clear. Establishing milestones throughout the planning process is an effective way to maintain momentum in plan development and implementation, especially with regards to measuring progress.

Regional action planning is a hierarchical process that proceeds from a general, all-encompassing vision statement to more specific goals, objectives, and milestones for achieving the vision. Each step is an important link in the process and a necessary prerequisite for the next aspect of the planning effort. As a general rule, the steps should be completed sequentially to ensure that actions completed later in the process are consistent with the vision statement and goals. However, many parts of the regional action planning process are iterative, and the plan should be flexible to accommodate change as more knowledge is gained about the Region of Concern. Goals, and especially objectives, are likely to be refined or otherwise modified as the information base grows.

This chapter addresses the importance of using stakeholders and the general public to develop a vision statement, goals, objectives, and milestones. This chapter also provides suggested techniques for establishing vision statements, goals, and objectives and presents a variety of examples. Drawing in part on the experiences of planning efforts in other areas of the United States, this chapter summarizes some key considerations in developing effective goals. Specifically, the chapter addresses:

- The Need for Vision Statements, Goals, Objectives, and Milestones
- Developing Effective Vision Statements, Goals, Objectives, and Milestones.

Developing a vision statement and corresponding goals is a crucial early phase of the planning process that focuses the additional investigations needed to develop an effective implementation approach.

This chapter defines objectives as more specific, often measurable, subparts of goals. Preliminary objectives and milestones may be prepared early in the planning process but are likely to be revised and expanded as more information is generated throughout plan development. Milestones, in particular, are likely to evolve from general to specific as the planning process progresses. Initial milestones will be developed as general targets associated with a goal, while later milestones will be more specific to address each step of an implementation action.

#### 4.1 THE NEED FOR VISION STATEMENTS, GOALS, OBJECTIVES, AND MILESTONES

The most important task in developing a Regional Action Plan is arguably the formulation of a vision statement and corresponding goals and objectives. The vision statement identifies the stakeholders' common purpose for the Region of Concern and provides the glue for holding the other components of the Regional Action Plan together. Empowering stakeholders to develop and reach consensus on the Regional Action Plan's vision statement, goals, and objectives is absolutely necessary to design an effective implementation approach. Working toward a unified vision and goals also focuses the planning process, thereby increasing the opportunity for efficient resource use.

The planning process is likely to be much more productive if early Regional Action Team consensus is achieved on the vision statement and goals. Such consensus establishes a common purpose and focus for the Regional Action Team. Operating without a clear vision statement and goals is like

#### Definitions and Examples of Vision Statement, Goals, Objectives, and Milestones\*

- **Vision Statement**—A very general statement identifying the desired future state of a Region of Concern that provides overall direction for the regional action planning process.

*Example: A healthy river and Bay environment providing the quality of water and habitat needed for indigenous species and recreational fishing.*

- **Goals**—Statements more specific than the vision statement, but still general, that describe a desired condition rather than a carefully defined end-point. Goals, when taken together, will move toward achieving the vision for the Region of Concern. Goals can be both short- and long-term and must be realistic. It is important to develop a mix of goals that are easy to implement/achieve early in the process (this will help build commitment/buy-in) and goals that may be more difficult (but are still realistic) to implement/achieve.

*Example: Return a sustainable recreational fishery in the river.*

- **Objectives**—More specific subsets of goals. Objectives can be used to guide the selection of concrete implementation actions and to judge proposed actions for funding priorities. They must be realistic, time-oriented, and sufficiently quantifiable to allow measurement of the plan's success.

*Example: Reduce ambient toxicity in the water and sediments in the Region of Concern so as to eliminate fish consumption advisories.*

- **Milestones**—Relate objectives to specific schedules. Again, it is useful to have both short-term and long-term objectives.

*Example: Reduce ambient toxicity in the water and sediments in the Region of Concern so as to eliminate fish consumption advisories by the year 2000.*

\* Examples are listed for illustrative purposes only.

traveling without a destination. Loosely defined objectives and milestones will fail to give the Regional Action Team the roadmap needed to measure progress during implementation. Stakeholder groups (e.g., Regional Action Team), including the lead agencies, often do not spend the time necessary to define properly a vision, goals, objectives, and milestones. Frequently, water resources planning efforts default to the Clean Water Act goal of "restoring beneficial uses" to the Region of Concern. While this is an admirable goal, it does not provide the level of specificity needed to guide the regional action planning process or to develop a measurable implementation approach. Stakeholder groups should be encouraged to think beyond a default regulatory goal to more broadly consider whether additional, more specific (and possibly less regulatory) goals should be developed.

Vague and undefined goals, objectives, and milestones cause problems in both developing and implementing Regional Action Plans. For instance, proposed implementation actions may be debated to a greater extent during plan development if the Regional Action Team did not build a consensus on goals and objectives earlier in the process. The process of developing a vision statement and goals can unify stakeholders. Developing an early consensus, however, does not guarantee that the group will agree on an implementation approach. Traditionally, these decisions, which incorporate economic, political, and social issues, are much harder to reach because they more directly affect stakeholders.

Undefined goals, objectives, and milestones can also erode plan implementation because they create a situation that weakens the accountability of parties responsible for implementing the plan. For instance, it is very difficult to measure success or to hold responsible parties, including public agencies, accountable if the plan's goals and objectives are not specific or measurable. Unclear goals and objectives can also reduce the value of a monitoring program because it is difficult to measure the results.

Securing commitments from elected officials to the goals and objectives will often increase the political accountability and impetus for the Regional Action Plan. In fact, commitment from top level management is often critical to a plan's success. Frequently, this level of buy-in may provide the needed authority (including regulatory) and financial resources required to improve plan development and implementation. Elected officials on the local and state level can also embrace the goals as political objectives.

Goals and objectives will evolve and change as the planning process moves forward. As more is learned about the Region of Concern, the goals and objectives may need to be modified to reflect better

the current state of knowledge. A successful regional action planning effort must be iterative, with the incorporation of re-evaluation steps and opportunities for plan adjustment.

## **4.2 DEVELOPING EFFECTIVE VISION STATEMENTS, GOALS, OBJECTIVES, AND MILESTONES**

This section describes the steps that the Regional Action Team should take in developing a Regional Action Plan that links a vision statement, goals, objectives, and milestones to problems and implementation actions. Although the process is iterative, the steps described in Exhibit 4-1 should generally be followed. The remainder of this section describes some of these steps in the following subsections:

- Conducting preliminary background research (Step 1)
- Developing a vision statement (Step 2)
- Establishing goals, objectives, and milestones (Steps 3, 5, and 6).

The subsections provide an overview of the process, including recommended methodologies, that could be applied when developing a vision statement, goals, objectives, and milestones. Information related to further problem definition (Step 4) is presented in Chapter 5 of this document.

### **Exhibit 4-1. Overview of Steps Needed to Develop a Vision Statement, Goals, Objectives, and Milestones**

1. **Conduct preliminary background research**—Gather and synthesize readily available information to prepare a general overview of chemical contaminant-related problems that are affecting the Region of Concern. Coordinate and, if applicable, integrate Regional Action Team efforts with existing plans and efforts (e.g., the Anacostia Watershed Restoration Committee and its six-point plan).
2. **Develop vision statement**—Use the background research to stimulate Regional Action Team development of a vision statement.
3. **Identify preliminary goals and objectives**—Use the background research, problem overview, and vision statement to facilitate Regional Action Team decision-making on preliminary goals and objectives.
4. **Further define problems**—Use the process presented in Chapter 5 of this document to further define problems in the context of the vision statement, goals, and objectives.
5. **Refine goals and objectives**—Modify preliminary goals and objectives and/or develop new ones, as necessary, as more is learned about the Region of Concern throughout the planning process, especially as problems become better understood.
6. **Develop milestones**—As the information base on the Region of Concern grows, it is possible to begin developing milestones for identified goals and objectives. Milestones will range from the general (e.g., achieving a goal by a certain year) to the specific (e.g., schedule for implementing each step of a proposed action).

Throughout the regional action planning process, technical experts and the scientific community should review the team's recommendations and supporting information to ensure that stakeholders have access to the most recent technical approaches and information and to provide an opportunity for balancing stakeholder interests with scientific information, as appropriate. Periodically, the team's progress should also be presented to the general public for their review and contributions. Section 3.6 of Chapter 3 provides more information on the importance of public participation.

#### **4.2.1 Conducting Preliminary Background Research**

It is important to have a general understanding of the problems facing the Region of Concern before a vision statement and preliminary goals and objectives can be established effectively. The reason for this is obvious—it is not expedient to have the Regional Action Team spend time and resources developing goals and objectives for problems that are not of concern. In later stages of the planning process, a much more detailed definition of the problems is needed to develop an effective, targeted implementation approach. Chapter 5 describes how to refine the understanding of problems by acquiring and interpreting information on the nature, extent, and sources of chemical contamination contributing to the problem. It is not practical nor desirable to complete these more detailed investigations before preliminary goals and objectives are established. Rather, goals and objectives should be used to focus the specific investigations needed to define problems so that a well-designed implementation approach can be developed.

The lead agency can use existing materials (e.g., reports, journal and newspaper articles, and fact sheets) and can contact groups or individuals familiar with the Region of Concern to build a basic understanding of issues and problems in the Region of Concern. The lead agency should present these background investigations for the Regional Action Team as a short paper or fact sheet summarizing the problems and other relevant information on the Region on Concern. Background materials prepared by the lead agency and distributed to the Regional Action Team in advance of its planned meeting for establishing a vision statement and preliminary goals and objectives, supplemented by presentations at the meeting and by Regional Action Team input, should provide the foundation needed to establish consensus on a preliminary problem definition and corresponding vision statement, goals, and, possibly, objectives. Because objectives are more quantifiable, they may be best developed later in the planning process. While it is necessary to focus the planning process by identifying key problems and corresponding goals, it is important not to focus too narrowly in these early planning stages, or other important problems could be excluded. The regional action planning process is a challenging one—

although it is necessary to focus the study to effectively use limited resources, it is also important to maintain an open mind and flexibility so that modifications can be made as more information is gathered.

Establishing specific goals and objectives based on an adequate general understanding of the environmental problems early in the planning process can minimize conflict and arguments about specific actions later on. For example, it may be clearer to an industry representative why stormwater plans and monitoring are necessary in a particular location within the Region of Concern if the stakeholder group establishes goals and objectives relating to the control of chemical contaminants from stormwater early in the process.

#### **4.2.2 Developing a Vision Statement**

Stakeholders should develop a vision statement as a way of creating a framework for more specific goals, objectives, and milestones. A vision statement should be a broad representation of stakeholder values, both human and non-human. The statement should convey a desired state for the Region of Concern. Stakeholders should consider the vision statement their overall mission. The vision should be a practical statement based on the physical, social, and political conditions in the Region of Concern. The vision statement, and the related goals and objectives, should recognize the current and expected land uses in the watershed surrounding the Region of Concern. In Baltimore Harbor or the Elizabeth River, for example, restoring water bodies to pristine conditions for aquatic life is not practical because of the current levels of chemical contamination and the expectation that most of the land will remain in urban and industrial use. A realistic vision statement could include restoring recreational fishing for species currently found in these Regions of Concern. Vision statements developed by stakeholders involved in regional action planning in several areas, including the Lower Green Bay area in Wisconsin and the San Francisco Bay in California, vary in their level of detail (San Francisco Estuary Project Management Committee 1993; Wisconsin Department of Natural Resources 1987; Wisconsin Department of Natural Resources and Green Bay Remedial Action Plan Public Advisory Committee 1993). Most statements, however, are broad-based and general, such as ensuring a healthy river and bay ecosystem.

As an example of a relatively specific vision statement, Exhibit 4-2 summarizes the citizens' desired state of the Lower Green Bay and Fox River Ecosystem that was developed by the Lower Green Bay Remedial Action Plan Citizens Advisory Committee (Wisconsin Department of Natural Resources and Green Bay Remedial Action Plan Public Advisory Committee 1993). This vision statement relates closely to the goals and objectives. For instance, the stakeholders who developed this statement obviously



**Exhibit 4-2. Example of a Relatively Specific Vision Statement for the Citizens' Desired State of the Lower Green Bay and Fox River Ecosystem**

1. A healthy river and Bay environment providing water quality and habitat for balanced and productive wildlife and plant communities including a well-balanced, sustainable, and edible sport and commercial fishery.
2. Water-based recreation opportunities including:
  - a. Accessible local swimming beaches on the Bay; and
  - b. Adequate boating areas and facilities,
3. Fox River and Lower Green Bay water quality that protects human health and wildlife from effects of contaminants and meets water quality standards which could provide for drinkable water after standard treatment.
4. Balanced public and private shoreline usage including park, agricultural, commercial, residential, and industrial lands.
5. An economical transportation network including both water and land-based systems which minimizes adverse environmental effects.
6. Point and nonpoint discharges and runoff consistent with the maintenance of the desired water quality future state.

Source: Wisconsin Department of Natural Resources and Green Bay Remedial Action Plan Public Advisory Committee (1993).

believed that a specific vision statement was necessary to guide plan development and to communicate a vision effectively to the public. The statement includes elements that other planning efforts, including the San Francisco Estuary Project, would include as goals and even objectives. For example, the element that involves point and nonpoint discharge and runoff control could be an appropriate objective. Developing a more specific vision statement may be possible if there is broad understanding of the problem and a general consensus on appropriate solutions early in the planning process. Also, as stated previously, the incorporation of vision statements and goals from planning documents that already exist for the Region of Concern or similar areas, such as watershed management plans, may allow for the development of a more specific vision statement.

Exhibit 4-3 provides an example of a general vision statement used as a preface for more specific goals. More than 100 stakeholders contributed to the vision statement, which was developed for the Comprehensive Conservation and Management Plan for the San Francisco Bay Estuary Project (San Francisco Estuary Project Management Committee 1993). The Estuary Project example, like the one for the Lower Green Bay, offers a vision that incorporates an ecosystem approach, not only concern about protecting human health and the environment from chemical contaminants.

**Exhibit 4-3. Example of a General Vision Statement and Associated Goals Developed for the Comprehensive Conservation and Management Plan for the San Francisco Bay**

**Vision Statement:** "We, the people of California and the San Francisco Bay-Delta Region, believe the San Francisco Bay-Delta Estuary is an international treasure and that our ongoing stewardship is critical to its preservation, restoration and enhancement. Acknowledging the importance of the estuary to our environmental and economic well-being, we pledge to achieve and maintain an ecologically diverse and productive natural estuarine system."

**Goals:**

- Restore and protect a diverse, balanced, and healthy population of fish, invertebrates, wildlife, plants, and their habitats, focusing on indigenous species.
- Assure that the beneficial uses of the Bay and Delta are protected.
- Improve water quality, where feasible, by eliminating and preventing pollution at its source, while minimizing the discharge of pollutants from point and nonpoint sources and remediating existing pollution.
- Manage dredging and waterway modifications to minimize adverse environmental impacts.
- Effectively manage and coordinate land and water use to achieve the goals of the Estuary Project.
- Increase our scientific understanding of the Estuary and use that knowledge to better manage the Estuary.
- Develop and expand nonregulatory programs, such as public-private partnerships and market incentives, in conjunction with regulatory programs, to achieve the goals of the Project.
- Preserve and restore wetlands to provide habitat for wildlife, improve water quality, and protect against flooding.
- Assure an adequate freshwater flow as one of the essential components to restore and maintain a clean, healthy, and diverse Estuary.

Source: San Francisco Estuary Project Management Committee (1993).

Although this guidance document focuses on chemical contaminants, the Regional Action Team may want to establish a vision statement and goals within the framework of a more holistic approach concerned about restoring a broader desired state (e.g., ecosystem restoration) for the Region of Concern. This can be accomplished by gathering information from stakeholder groups addressing other concerns, such as wetlands and wildlife, and planning goals, including public access and recreation.

Several methods, some more elaborate than others, can be used to develop vision statements. The methods include using visual preference or community image surveys, verbally characterizing a vision, and employing citizen surveys. A useful and creative way to develop a vision statement is to perform a visual preference survey of the stakeholders' images or visions of the desired future state of the watershed. Stakeholders (e.g., the Regional Action Team) are shown a series of photographic slides that illustrate possible visions for the watershed. The slides, taken from existing areas, should provide

a range of visions, representing ideal and current conditions, of the various qualities of a desired future state (e.g., fishing, other recreation, public access, wildlife, riparian habitat). As few as 40 slides can be used. The group should rank the slides on a scale of 1 to 5, with 1 being the preferred vision. The purpose of this exercise is to create a common vision of the Region of Concern. If appropriate, after the group establishes the vision, a local artist (perhaps a community college art teacher or another person interested in watershed protection that could volunteer his or her time) could visit the group and draw a sketch based on the shared understanding. Exhibit 4-4 provides an example of a common vision sketch based on the environmental indicators program of the Chesapeake Bay Program. The use of pictorial images to convey a vision is gaining popularity in the design of community land use and development plans and is appropriate for identifying a vision for the uses and qualities of a watershed (Nelessen 1994).

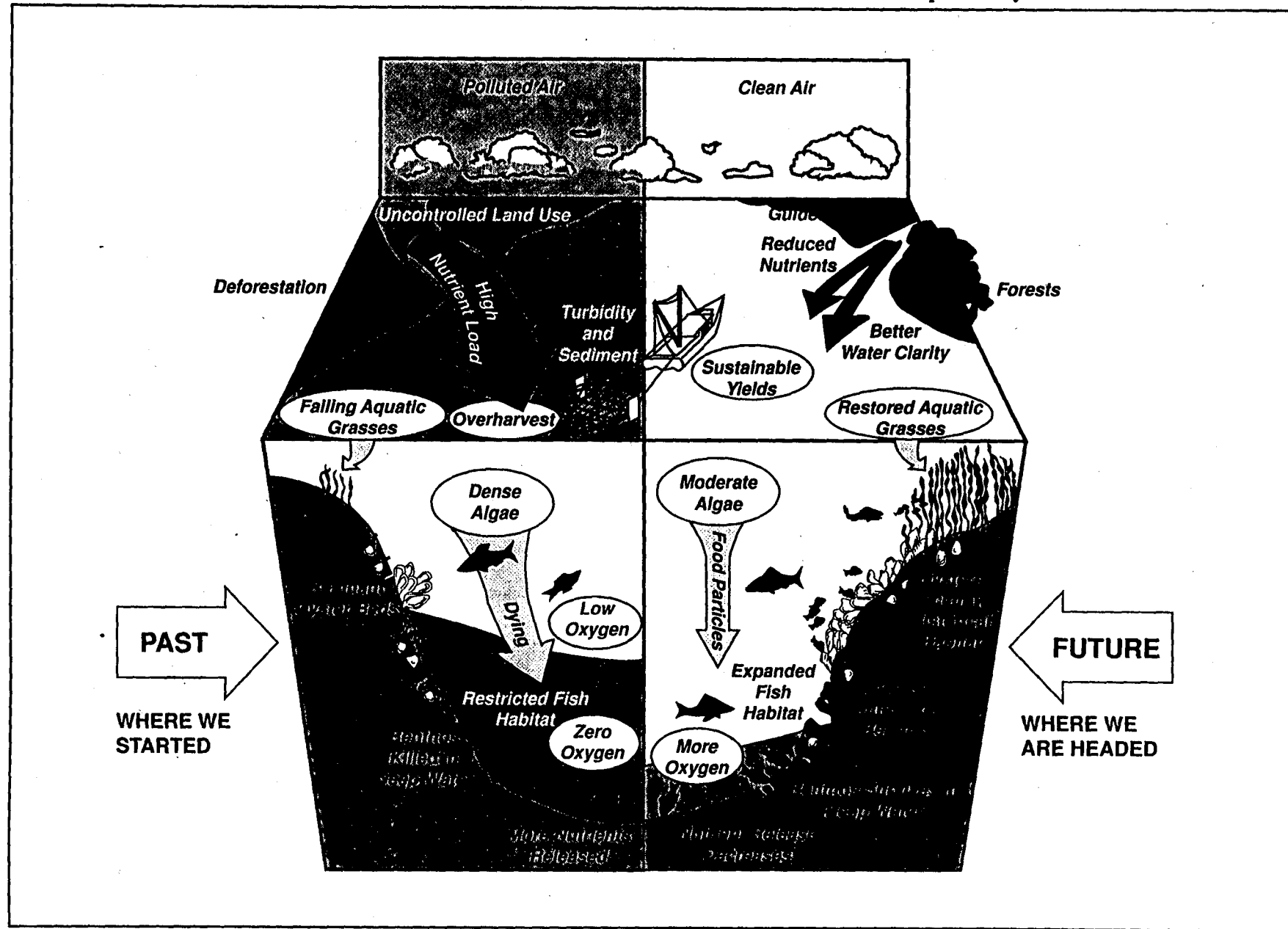
The general public can also provide input for establishing the vision statement. When the vision, goals, and objectives are being established, large meetings and workshops should be held to invite public participation. A visual preference survey can be given at a public meeting, or the common vision, as well as possible alternative visions, established by the Regional Action Team can be displayed and discussed.

Other ways of getting public input for the vision-setting process include:

- Asking students to develop images for class projects
- Videotaping images of the watershed (perhaps based on another area that is already at a "desired future state") and showing these images on local news programs and to community and business groups.

Citizen surveys, either by mail or telephone, to determine public perceptions of the problems and images for a desired future state provide another technique for developing a vision statement. Preferences or tradeoffs between different values, such as aquatic habitat and public access to rivers, can be gauged and numerically weighted during these surveys or focus groups. Preference surveys are often used in environmental management to determine the relative importance of environmental and other attributes. For example, this technique has been used extensively in siting studies for industrial facilities. Using the resulting information, stakeholders and public agency decision-makers can craft solutions that consider public preferences. Exhibit 4-5 provides a list of example questions that could be included in a citizen survey.

Exhibit 4-4. Common Vision Sketch of the Desired Future State for the Chesapeake Bay Basin



Source: Chesapeake Bay Program (1994a).

**Exhibit 4-5. Example Questions for a Citizen Survey**

1. What role or interests do you have in the Region of Concern?
2. What do you see as the major problems (associated with chemical contamination) in the Region of Concern?
3. Has chemical contamination in the Region of Concern caused you to stop doing or do less of the things you used to do for recreation (e.g., fishing, boating, sightseeing)?
4. Has chemical contamination in the Region of Concern affected you in any other ways?
5. Do you think that the current water quality in the Region of Concern makes it very safe for swimming, somewhat safe, somewhat unsafe, or very unsafe?
6. Do you think that the current water quality in the Region of Concern makes it very safe to eat fish and other seafood from the Region of Concern, somewhat safe, somewhat unsafe, or very unsafe?
7. Do you think that the current water quality in the Region of Concern makes it very safe for fish and other aquatic life that live in the Region of Concern, somewhat safe, somewhat unsafe, or very unsafe?
8. What do you think the highest priority should be for the Region of Concern (e.g., to make it safe for swimming, safe to eat seafood from, safe for fish and other aquatic life)?
9. Can you think of any other improvements, with regards to problems associated with chemical contamination, that you would like to see in the Region of Concern?
10. What is your primary goal for addressing chemical contamination issues in the Region of Concern?
11. What method or techniques should be used to involve citizens in the development of the Regional Action Plan (e.g., newsletters, workshops)?

Sources: Chesapeake Bay Program (1994b); Lane Council of Governments (1995).

**4.2.3 Establishing Goals, Objectives, and Milestones**

Specific goals, objectives, and milestones must be developed to realize the vision established for the Regional Action Plan. They should be clearly stated and supported by a realistic assessment of the problem and the feasibility of resolution. The goals should encourage physical change in the watershed, such as restoring fish and wildlife populations. Goals should also be established for improving scientific understanding and public education, as well as for developing management approaches, such as regulatory and nonregulatory programs (e.g., public-private partnerships).

Objectives are even more specific than goals. They can establish quantitative measures, such as a percentage reduction in a particular chemical contaminant or the attainment of a particular water quality standard. Building a capital improvement project, such as a retention basin for combined sewer

overflows, or creating a public education center are other examples of objectives. Achieving high profile and easy to implement objectives, such as public education centers and improved public access to the Region of Concern, early in the plan's implementation can create momentum and public support for more complex and expensive objectives, such as the establishment of a stormwater retention basin. Preliminary objectives can be developed early in the planning process, at the same time goals are being established. Because they contain more specific information than goals, however, objectives will probably be developed and refined throughout the process as the information base expands.

Milestones should relate objectives to a specific end-point (e.g., product) and schedule. For example, an appropriate milestone could be to reduce polychlorinated biphenyl concentrations in sediment in a particular stream section by 40 percent by the year 2000.

Exhibit 4-6 shows the relationship among the vision statement, goals, objectives, and milestones. As shown in this exhibit, goals and objectives should be measurable. Consequently, milestones provide timetables for monitoring and tracking progress towards achieving goals and objectives. The Regional Action Team also may choose to add comments reflecting possible opportunities and challenges associated with the goals and objectives. For example, objective I.A.3 simply notes that the milestones would necessitate nearly a "... 30 percent reduction from current levels." The exhibit formats are useful models for Regional Action Plans in the Chesapeake Bay area.

If the process to establish goals and objectives adequately accounts for the interests of stakeholders, it should be possible to get volunteers (e.g., members of the Regional Action Team) to marshal specific implementation actions. As a backup strategy, the lead agency may want to give the goals and objectives more clout by incorporating them into the Clean Water Act regulatory framework. The process would formally establish a goal as a regulatory standard so that it becomes a designated use for the Region of Concern or a segment of this area. This procedure must be performed in accordance with applicable water quality regulations (40 *CFR* 131).

In certain Regions of Concern, plans and programs related to watershed restoration have been developed and are being implemented. For example, a six-point action plan has been developed for the Anacostia River watershed (Anacostia Restoration Team and MWWCOG 1991). As mentioned previously in this chapter, the Regional Action Team should review existing plans and programs already developed for the Region of Concern and similar locations when establishing goals, objectives, milestones, and specific implementation actions. The team should, for example, review other Regional Action Plans,

Exhibit 4-6. Regional Action Plan Example—Vision Statement, Goals, Objectives, and Milestones\*

Vision Statement	Goals	Objectives	Milestones	Comments
I. Water quality that protects human health and wildlife from the effects of chemical contaminants and meets water quality standards that could provide drinkable water after standard treatment	I.A Achieve and maintain water quality that protects the ecosystem from the adverse effects of chemical contaminants on shoreline and aquatic vegetation, fish, aquatic life, and wildlife utilizing the aquatic resources and that protects human health	I.A.1 Reduce chemical contaminants in the water column to levels that meet the most stringent state and/or federal fish consumption advisory levels and protect human health, wildlife, and fish and aquatic life, as well as their reproductive success <sup>1</sup>	Achieve by the year 2000	
		I.A.2 Reduce chemical contaminants in fish tissue to levels that protect the humans, birds, and animals that consume them and that protect reproductive success <sup>1</sup>	Achieve by the year 2000	
		I.A.3 Reduce chemical contaminants in wildlife tissue to levels that protect human and wildlife health and do not impair reproductive success (i.e., Food and Drug Administration Action Level of $2.0 \times 10^3 \mu\text{g/kg}$ ) <sup>1</sup>	Achieve by the year 2000	30-percent reduction from current levels
		I.A.4 Reduce chemical contaminants in sediment or the release from sediment to levels that are not acutely or chronically toxic to fish and aquatic life or humans and wildlife that consume them <sup>1</sup>	Achieve by the year 2005	

\* Items are listed for illustrative purposes only and are not intended to be an exhaustive list. They are partly based on the *Lower Green Bay Remedial Action Plan, 1993 Update* (Wisconsin Department of Natural Resources and Green Bay Remedial Action Plan Public Advisory Committee 1993).

<sup>1</sup> Specific contaminants include polychlorinated biphenyls, dioxin, DDT, ammonia, mercury, and lead.

area-wide water quality management plans (e.g., 208 plans, 319 plans, tributary strategies), sewer service area plans, wastewater facility plans, and other specific watershed plans. Proceeding from this review, the group can incorporate ongoing initiatives into the Regional Action Plan. For instance, if an existing plan establishes goals for stormwater management (e.g., development of municipal stormwater management plans), these goals should be incorporated, as appropriate, into the Regional Action Plan rather than developing new goals. It is also important to ensure that goals, objectives, and milestones developed for the Regional Action Plan are not in conflict with ongoing planning efforts.



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## **CHAPTER 5**

### **DEFINING THE PROBLEM**

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## **CHAPTER 5**

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## CHAPTER 5. DEFINING THE PROBLEM

The overarching objective when defining problems in the context of regional action planning is to assemble and evaluate sufficient information to develop a sound, defensible, and targeted implementation approach for the Regional Action Plan (see Chapter 7 of this document for information on developing an implementation approach). This requires identifying adverse ambient effects, linking them to elevated concentrations of chemical contaminants, and identifying sources of contamination contributing to the elevated concentrations. The approach further requires focusing on priorities established by the Regional Action Team so that limited resources can be used most efficiently and investigations can be completed in a timely fashion. As described later in this chapter, the investigations needed

**Defining Problems for the Regional Action Plan**

Regions of Concern are designated when available data show evidence for a causal relationship between adverse ambient effects (i.e., effects) and elevated concentrations of chemical contaminants above thresholds associated with adverse effects (i.e., stressors) (Chesapeake Bay Program 1994). Therefore, the problem definition portion of the Regional Action Plan must identify adverse ambient effects (e.g., water column and sediment toxicity, impaired ecological community structures, fish and shellfish tissue contamination) and link them to elevated levels of chemical contamination. Further, to develop an implementation approach for the Regional Action Plan, the problem definition must also include an assessment of the sources contributing to the elevated levels of chemical contamination. The investigations should be geared toward defining the linkages between adverse ambient effects, elevated levels of chemical contamination, and sources of the elevated levels of chemical contamination.

To streamline the planning process, all investigations must be prioritized. The problem definition should prioritize adverse ambient effects in order of preference for future actions. The types of chemical contaminants causing the adverse effects, and their sources, should be similarly prioritized.

to define problems in the Region of Concern will move from the general to more specific, although the following three tasks are critical to the process:

1. Identifying and prioritizing adverse ambient effects associated with chemical contamination
2. Identifying and prioritizing chemical contaminants causing or contributing to the adverse ambient effects
3. Identifying and prioritizing sources of chemical contaminants.

Although described separately, many of the activities to complete these investigations are similar, especially when evaluating chemical contaminants and their sources, and may be conducted simultaneously. These investigations are also dynamically related to the development of the Regional Action Plan's vision statement, goals, and objectives. As described in Chapter 4 of this guidance, a preliminary overview of problems is used by the Regional Action Team to develop a vision statement,

and initial goals and objectives. The vision statement, and initial goals and objectives, are used, in turn, to focus further, more specific, investigations needed to define problems (e.g., providing more detail on chemical stressors and their sources).

It is crucial to keep the problem definition investigations focused. Not only should the investigations target priorities established by the Regional Action Team, but existing information (e.g., technical reports) should be used whenever possible. Additional analyses (e.g., evaluating and/or integrating environmental data bases, calculating waste load allocations) should only be conducted if the existing materials do not provide sufficient background information for sound decision-making. Original investigations, such as developing and implementing a monitoring program, are beyond the scope of the Regional Action Plan, but could be proposed as an implementation action in the plan.

Exhibit 5-1 summarizes an approach that will help focus problem definition investigations for the Regional Action Plan. This chapter describes available sources of information relevant to conducting the investigations and provides an overview of techniques that can be used for ranking and decision-making. Chapter 4 describes how to develop a vision statement and define preliminary goals and objectives using available information on problems. The chapter presents information in the following two sections:

- Identifying and Ranking Adverse Ambient Effects
- Identifying and Ranking Chemical Contaminants and Sources.

As shown in Exhibit 5-1, the lead agency, supported by existing groups, and/or subject matter experts, will usually initiate this process by providing an overview of the problems (including a summary of adverse ambient effects and associated chemical contaminants and their sources), based on readily available information, to the Regional Action Team at one of its first meetings. This general background information is used by the Regional Action Team to facilitate development of a vision statement, and preliminary goals and objectives (see Chapter 4). The vision statement and preliminary goals and objectives are necessary to guide the planning process and focus further investigations. The Regional Action Team will also use this background information, in conjunction with the vision statement and preliminary goals and objectives, to begin prioritizing the adverse ambient effects according to level of importance for future action. The Regional Action Team may feel that the available materials provide sufficient information to prioritize ambient effects, or it may request additional investigations. It is important that the Regional Action Team complete its prioritization of adverse ambient effects as early in the planning process as possible, because this information will guide most subsequent investigations.

**Exhibit 5-1. Description of the Steps Required for Defining the Problems in a Regional Action Plan**

- **Prepare Overview of Problems**

The lead agency (and/or its partner or designee) will assemble readily available background information to prepare an overview of problems for consideration by the Regional Action Team. Information should be evaluated to summarize what is readily known about adverse ambient effects, elevated levels of chemical contaminants, and sources of the chemical contaminants. Three main sources of information should be evaluated at this stage:

- Results of Regions of Concern identification process
- Other available, documented information (e.g., technical reports)
- Consultation with subject matter experts.

- **Develop Vision Statement, and Preliminary Goals and Objectives (see Chapter 4)**

The lead agency (and/or its partner or designee) will present the overview of problems (e.g., visual presentation, fact sheets) to Regional Action Team and obtain input from the team on the completeness of the definition and to further identify problems and additional sources of information. The information on problems will be used as the foundation for developing a vision statement and preliminary goals and objectives.

- **Prioritize Adverse Ambient Effects**

After developing the vision statement, and preliminary goals and objectives, the Regional Action Team will rank adverse ambient effects according to priority for action. If the Regional Action Team feels they do not have adequate information to prioritize, additional investigations may be conducted. Sources of information for additional investigations include:

- Clean Water Act authorities
- Environmental data bases
- More extensive literature reviews and consultation with subject matter experts.

- **Conduct Additional Investigations to Identify and Prioritize Chemical Contaminants and Their Sources**

The lead agency (and/or its partner or designee) and the Regional Action Team will conduct investigations needed to identify chemical contaminants causing or contributing to the adverse ambient effects and link chemical contaminants to their sources. The following investigations might be appropriate depending on the required level of detail:

- Review existing materials
- Analyze environmental data bases (including geographic information systems)
- Perform modeling.

After developing a vision statement, goals and objectives, the Regional Action Team will conduct more detailed investigations to further define the problem (i.e., identifying and prioritizing chemical contaminants and their sources) so that sufficient information is available to develop the implementation approach for the plan. Generally, these more detailed investigations ask who, what, when, where, and how questions, such as:

- What is causing the problem? (e.g., investigations into contaminant types, such as oily wastes)
- Who is contributing to the problem's cause? (e.g., investigations into contaminant sources, such as petroleum storage facilities)
- When does the problem occur? (e.g., investigations into time and frequency, such as low volume leaking on a continuous basis)
- Where does the problem occur? (e.g., investigations into which portion of the Region of Concern is affected, such as the lower half-mile of the river)
- How does the problem occur? (e.g., investigations into the exact cause of the problem, such as leaking tanks and insufficiently treated storm water runoff).

Although these questions do not have to be answered in any particular order, the Regional Action Team should seek this type of information, to the extent possible, to have an adequate basis of understanding for developing the implementation approach.

The more detailed investigations needed to develop the implementation approach should always be conducted in the context of the vision statement, and preliminary goals and objectives defined by the Regional Action Team. This type of focused, or targeted, investigation is necessary to keep the planning process on track and to efficiently and effectively utilize limited resources. Too often, planning efforts suffer because they take on too much, become diffuse and unfocused. For example, after several years of remedial action planning in the Great Lakes, planners found that the process had become "very complex, time consuming, and cumbersome" because the focus of the remedial action planning process had become "development of detailed, voluminous documents rather than identification and implementation of actions to address priority environmental issues in the Areas of Concern (Klemans 1993)." As a result, the remedial action planning process was revised through a series of conferences and workshops in 1993 to streamline the plans in two key ways (Klemans 1993):

- Agree on a long-term "vision" and short-term goals/objectives
- Prioritize environmental issues and focus activities on the highest priorities first.

This guidance acknowledges the lessons learned in the Great Lakes and promotes an approach that requires prioritizing information for action. The approach described in this chapter presents the full range of potential activities that could be accomplished when defining problems in the Region of Concern. Remembering that the overarching consideration when defining problems is to limit investigations to the

level of detail needed to develop a sound implementation approach, the more complicated and time-consuming procedures described in this chapter should only be pursued if they are needed to clarify areas of uncertainty. If readily available background information (e.g., technical reports) summarizes adverse environmental effects, stressors, and sources of the elevated levels of chemical contaminants, the Regional Action Team may not need to pursue more detailed investigations. Expending limited resources on marginally useful data collection and analysis is not cost-effective.

#### Overarching Considerations When Evaluating Information on Problems

- Start with readily available information and conduct additional investigations as needed. Use existing, and readily available, sources of information as much as possible.
- Focus investigations on those areas needed to achieve the plan's vision statement, goals, and objectives.
- Do not overanalyze information. Limit the level of detail to that needed by the Regional Action Team to make informed decisions regarding an implementation approach (see Chapter 7 of this document for more information).
- Ensure that adequate resources are saved to complete later stages in the planning process (e.g., developing implementation actions). Avoid over-characterizing and overanalyzing information (e.g., when defining problems) in the early planning stages.

## 5.1 IDENTIFYING AND RANKING ADVERSE AMBIENT EFFECTS

Adverse ambient effects must be identified and ranked in order to focus the regional action planning process. A basic understanding of adverse ambient effects provides the foundation for developing the Regional Action Plan's vision statement, goals, and objectives. This, in turn, provides the focus for prioritizing adverse effects and further defining the problem to identify and prioritize chemical contaminants and their sources. This section of the guidance describes the process of assembling and evaluating information to identify and rank adverse ambient effects. It describes available sources of information and provides an overview of approaches that could be used to rank the adverse environmental effects in order of priority for action.

### 5.1.1 Identifying Adverse Ambient Effects

There are many sources of information that can be tapped by the lead agency to identify adverse ambient effects. The lead agency should begin its investigations by gathering readily available information and then, if necessary, assemble additional sources. The lead agency should first contact the Toxics Subcommittee's Region of Concern Workgroup and/or the Chesapeake Bay Program Office's Toxics Coordinator to determine the availability of information as a result of the Regions of Concern identification process. The extent of data accumulated and synthesized for this process will determine whether additional investigations are needed. Published reports and other written materials (e.g., journal



articles, white papers) are other good sources of information. Input from the Regional Action Team and subject matter experts should also be solicited.

Researchers and managers outside of the immediate Chesapeake Bay Program agencies and institutions may also be working in some of the Regions of Concern. They may be able to contribute additional information and expertise and identify local experts who are more familiar with some of the areas. It may also be possible to obtain relevant technical reports, published papers, and hard copy or electronic data from these sources.

The remainder of this section describes the types of information that might be available from the Regions of Concern identification process and identifies potential, additional sources of information.

### **Using Regions of Concern Information**

When an area is designated as a Region of Concern, it has usually undergone a fairly intensive data analysis procedure using written materials assembled by the Toxics Subcommittee's Regions of Concern Workgroup and information contained in the Chesapeake Bay Program's Toxics Data Base. The Toxics Subcommittee's Regions of Concern Workgroup evaluates information to determine if an area qualifies as a Region of Concern. The process comprises the following steps (see Appendix A):

1. Initial identification of areas where there is reason to believe a chemical contaminant-related problem is present
2. Compilation of evidence for the presence of chemical contaminant-related problems
3. Classification into one of four categories using a matrix of exposure and effects indicators with quantitative thresholds and professional judgment.

The third step of the Regions of Concern identification process is the most data intensive and involves examining the data against some measure of severity (e.g., thresholds or standards). The data requirements for the Regions of Concern identification protocol are very specific and include an evaluation of contaminants in water and/or sediment and effects data (e.g., toxicity, fish tissue contamination). Factors examined in Step 3 include (see Appendix A for more detail):

- Water column contamination
- Bottom sediment contamination
- Water column toxicity

- Bottom sediment toxicity
- Benthic community structure
- Finfish tumors
- Finfish and shellfish tissue contamination.

From the investigations conducted for the Regions of Concern identification process, especially Step 3, information on problems, chemicals, and sources will begin to be synthesized. To designate a Region of Concern using the identification protocol, adequate data must exist; otherwise, the area is characterized as having insufficient data and designation is postponed pending further investigation. In some cases, areas may be named as Regions of Concern without going through the formal identification protocol (e.g., Anacostia River, Baltimore Harbor, and Elizabeth River). However, this is more the exception than the rule. Areas being considered as potential Regions of Concern are usually subject to the protocol outlined in Appendix A. Therefore, an excellent foundation for the problem characterization phase of the Regional Action Plan development may exist in many cases.

### **Reviewing Additional Sources of Information**

If additional data are needed to identify adverse ambient effects, other sources can be accessed. The Clean Water Act prescribes that the states adopt water quality standards recognizing the value of our Nation's waters for "...their use and value as public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and also taking into account their use and value for navigation" (CWA 303(c)(2)(a)). As a result, the states in the Chesapeake Bay Basin have adopted water quality standards for all waters, establishing a list of beneficial uses often on a segment-specific basis. By consulting state water quality standards (which include a list of designated uses for all segments in their jurisdiction), the Regional Action Team can develop a list of desired beneficial uses for the Region of Concern. By assessing the attainment of these beneficial uses, additional information regarding problems in the Region of Concern can be gathered. It may be necessary to consult numerous sources to determine the status of use attainment, including direct consultation with the state agency responsible for preparing the following reports mandated by the Clean Water Act:

- **Section 305(b)**—Provides data on whether uses are being supported and what sources/pollutants are barring attainment of uses
- **Section 304(l)**—Identifies all surface waters not achieving water quality standards due to the discharge of toxic conventional and nonconventional pollutants

- **Section 319**—Identifies waters adversely affected by nonpoint sources
- **Section 303(d)**—Identifies waters not meeting/not expected to meet water quality standards in the absence of water quality-based control measures.

In addition, a well-selected and representative Regional Action Team should be able to supplement the list of information sources, if necessary. Numerous readily accessible data bases may also provide information pertinent to identifying problems and impaired uses. These data bases may provide information on chemical contaminants and sources as well. Exhibit 5-2 lists problems or impaired uses potentially present in a Region of Concern and identifies relevant information sources. Appendix C provides more detail on these sources and additional tools that can be used to obtain information (e.g., other federally compiled data bases). The sources in Appendix C are listed alphabetically. The Regional Action Team will need to consider, as appropriate for the specific Region of Concern, some of the following use impairments or other indicators and evidence of environmental and biological health:

- Advisories on fish and wildlife consumption
- Tainting of fish and wildlife flavor
- Degradation of fish and wildlife populations
- Presence of fish tumors or other deformities
- Bird and/or animal deformities or reproductive problems
- Degradation of benthos
- Restrictions on dredging activities
- Restrictions on drinking water consumption, including taste/odor problems
- Beach closings
- Aesthetics degradation
- Added costs to agricultural/industry water use consumption
- Degradation of phytoplankton/zooplankton populations
- Loss of fish and wildlife habitat.

When developing final problems and goals statements, the Regional Action Team may choose to further specify preliminary assessments of problems (use impairments) and goals (beneficial uses) to establish a solid framework for subsequent regional action planning analyses. For example, rather than having a goal of "maintaining a recreational fishery," the Regional Action Team may want to refine the goal to "improving the fishery for striped bass at the X pier." Further definition of the desired goals for the Region of Concern, both in definitional and geographic/spatial terms, will focus on analyses directed

Exhibit 5-2. Potential Sources of Information<sup>1</sup>

Problem/Impaired Uses	Potential Information Source
Atmospheric Deposition of Contaminants	Aerometric Information Retrieval System (AIRS) Database - Data on airborne pollution
Superfund Sites	Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database - Data on all aspects of cleanup and inventory of sites Record of Decision System (RODS) Database - Tracks history of cleanup sites, response actions, and remedies Facility Index System (FINDS) Database - Basic and specific information on regulated facilities
Hazardous Waste Generator or Transfer/Storage Facility	Biennial Reporting System (BRS) Database - RCRA data on waste generation, management, and minimization Resource Conservation and Recovery Information System (RCRIS) Database - Tracks permit application status and compliance monitoring
Agricultural Runoff of Pesticides	Pesticide Monitoring Inventory (PIN) - Inventory on pesticide monitoring Agricultural Waste (AgWaste) Database - Data on management, disposal, and productive use of agriculture waste Pesticide Action Network Updates Service (PANUPS) - Variety of information on integrated pest management and pesticide use
Water Column Contamination	Ocean Data Evaluation System (ODES) Database - Data on sewage discharges, NPDES, ocean dumping, and industrial discharges Storage and Retrieval (STORET) Database - Files on CWA, TSCA, RCRA, drinking water, and solid waste STORET-Water Quality System (WQS) File - Contains information from monitoring sites Water Pollution Control Act Section 305(b) Reports - Data on each state's surface water and groundwater quality Water Body System (WBS) Database - Data on water body specific assessments per 305(b) Aquatic Toxicity Information Retrieval (AQUIRE) Database - Data on the effects of toxics on aquatic organisms
Contaminated Sediments	National Sediment Inventory (NSI) - Data on nature, extent, and causes of sediment contamination Ocean Disposal Database (ODD) - Data on ocean disposal of sediments from U.S. Corps of Engineer Projects Accumulation Factor Database (AFD) - Data on concentrations of organic chemicals in sediments and organisms Contaminants Database - Data on sediment and tissue residue levels of dioxins, furans, PAHs, and PCBs AQUIRE Database - Data on the effects of toxins on aquatic organisms
Urban/Stormwater Runoff	Stormwater Bulletin Board - Information shared between users, including special studies and compliance monitoring

Exhibit 5-2. Potential Sources of Information<sup>1</sup> (continued)

Problem/Impaired Used	Potential Information Source
Fish Consumption Advisories	Fish Advisory Bulletin Board National Fish Tissue Data Repository – National repository on potential risks of chemical contaminants
Water Column Toxicity	AQUIRE Database – Data on the effects of toxics on aquatic organisms
Industrial Discharges/ Municipal Discharges	Toxic Release Inventory (TRI) Database – Data on chemical releases, offsite waste transfers, and waste treatment Permit Compliance System (PCS) Database – Information on NPDES facilities STORET Database – Files on CWA, TSCA, RCRA, drinking water, and solid waste FINDS Database – Basic and specific information on regulated facilities Industrial Facilities Discharge (IFD) Database – Information on 1,200 NPDES discharges Complex Effluent Toxicity Information System (CETIS) – Provides whole effluent toxicity data
Restrictions on Drinking Water	Federal Reporting Data System (FRDS) Database – Information on public drinking water supplies STORET – Files on CWA, TSCA, RCRA, drinking water, and solid waste
Groundwater Contamination	FRDS Database – Information on public drinking water supplies
Fish Kills	STORET Fish Kill – Files on fish kills Water Pollution Control Act Section 305(b) Reports – Data on each state's surface water and groundwater quality
Degradation to Benthos, Fish, and Zoo/Phytoplankton Populations	STORET-Biological Data System (BIOS) – Data on community structure and habitat of organic organisms
Degradation to Habitat	STORET-BIOS – Data on community structure and habitat of organic organisms STORET-Daily Flow System (DFS) – Data on stream flow and water quality standards
Water Quality	Chesapeake Bay Water Quality Standards (CBWQS) Database – Data on water quality standards and aquatic life criteria Integrated Risk Information System (IRIS) – Data on chemical health risks and regulatory summaries
Habitat Loss/Land Use	Land Use and Data Analysis (LUDA) Database – Data on land use types and locations for entire United States National Wetlands Inventory (NWI) – Computerized mapping of wetlands
Restriction on Shellfish Harvesting	State Public Health Departments – Contact directly for reports and bulletins U.S. Food and Drug Administration (USFDA) – Contact directly for reports and warnings

**Exhibit 5-2. Potential Sources of Information<sup>1</sup> (continued)**

<b>Problem/Impaired Used</b>	<b>Potential Information Source</b>
Bird/Animal Deformities	State Resource Protection Agency National Wildlife Federation
Restrictions on Dredging	State Port Authority Army Corps of Engineers
Beach Closings	State Health Departments
<b>Other Information</b>	
Mapping the Region of Concern	Geographic Resources Information Data System (GRIDS) Database – Commonly needed geographic data products National Wetlands Inventory (NWI) – Computerized mapping of wetlands
General Information	Information Systems Inventory (ISI) Database – Information on more than 500 EPA systems Online Library System (OLS) Database – Bibliographic citations from EPA and other agencies U.S. Geological Survey, Mapping Earth Science Information Center U.S. Geological Survey, National Water Information Clearinghouse
Pollution Prevention	EnviroSense (formerly Pollution Prevention Information Exchange System) - Provides pollution prevention, regulatory, case study, research data, and funding information Small Business Ombudsman Clearinghouse – Regulatory activities information for small communities/business
Hazardous/Solid Waste	Clean-Up Information BBS (CLU-IN) – Bulletin board on hazardous waste remediation and corrective action
Pesticides	National Pesticides Information Retrieval System (NPIRS) – Information on registered pesticides National Pesticide TeleCommunications Network (NDTN) – Impartial information on pesticides
Nonpoint Sources	Nonpoint Source (NPS) Information Exchange – Information on nonpoint source water pollution

<sup>1</sup> Appendix C contains more detailed information on the information sources, including contacts.

at identifying chemical contaminants of concern and on the identification and evaluation of implementation actions. Refinement of the goals may proceed throughout the regional action planning process in an iterative fashion. Chapter 4 of this guidance document provides more information on developing goals. To enhance the implementation of the Regional Action Plan, it is important to clearly define measurable goals.

Adverse effects can be compiled on a segment or sub-segment basis within the Region of Concern. Exhibit 5-3 presents one way of organizing this information. The Regional Action Team will use its initial assessment of adverse ambient effects as a starting point for analysis. As the analyses unfold, an iterative process will develop, where potential, and actual adverse effects are added, subtracted, and modified from the original list. Regional Action Plan developers should continually review the original list of possible adverse effects by asking some of the following questions:

- Is it a complete list of possible adverse effects?
- Have all stakeholders been consulted, or do additional members of the stakeholder community (e.g., subsistence fisherman) need to be contacted to verify and/or expand the list?
- Are adverse effects not associated with elevated levels of chemical contaminants included?
- Can adverse effects be identified as acute, chronic, or sporadic/episodic?

The Regional Action Team should develop as complete an inventory of potential adverse ambient effects as possible, even if the adverse effects have not been fully documented. For example, if recreational fisherman are not using public access point A, which is upstream from restricted site B, then this "impairment" should be noted for further study even though fishing is not restricted at point A. If past studies have documented that submerged aquatic vegetation degradation is correlated with elevated turbidity levels due to nonpoint source runoff, the Regional Action Team may want to explore the possibility that pesticide runoff might also contribute to the problem in this localized area. Potential adverse effects should not be removed from the list too early; further investigation of existing chemical contaminant data may reveal that past studies missed elevated contamination levels of chemical constituents as a contributing cause to the adverse effect.

### **5.1.2 Ranking Adverse Ambient Effects**

Information gathered for the Regions of Concern identification protocol provides an excellent starting point for evaluating and ranking adverse ambient effects. The protocol provides a decision-making framework for ranking the relative "severity" of problems by providing thresholds for comparison with contaminant and/or effects data. This information, coupled with input from stakeholders on their priorities (e.g., stakeholders can be used to develop evaluation criteria against which adverse effects can be weighed—see Appendix D on ranking and decision-making procedures), provides the base to prioritize and rank adverse effects for action.

Exhibit 5-3. Example Goals/Beneficial Uses and Associated Adverse Effects

Goal/Beneficial Use	Adverse Ambient Effects	Location
<b>Anacostia River<sup>1</sup></b>		
Restore fishery to historic species abundance and diversity.	Elevated concentrations of chemical contaminants in water column and sediments are prohibiting species diversity and reproduction.	Particularly in Sligo Creek and Lower Beaverdam Creek.
Restore recreational subsistence fishery for catfish, carp, and eels.	Elevated concentrations of PCBs and chlordane in sediments are reflected in bottom feeder tissue, resulting in fishing advisories.	Lower Anacostia: Kingman Lake, North East Boundary combined sewer overflow, 11th Street and South Capitol Street bridges, Buzzards Point Marina, and Washington Ship Canal.
Improve aquatic life habitat in Anacostia River.	Sediment loads altering natural habitats.	High in lower Northwest Branch, Point Branch, and Lower Indian Creek.
<b>Elizabeth River<sup>2</sup></b>		
Improve aquatic species abundance and diversity.	Sediments and water are contaminated with organic compounds and metals, which is reducing species diversity and abundance. Occasional fish kills also occur.	Highest levels in southern and western branches of the Elizabeth River.
Alleviate the potential for adverse impacts on biota, such as skin lesions, cataracts, and fin rot. Restore public confidence in recreational fishery.	Sediments contaminated with polyaromatic hydrocarbons (PAHs) are causing finfish abnormalities.	Southern and western branches of the Elizabeth River.
Restore shellfish fishery.	PAH-contaminated sediments are impairing shellfish fishery.	Hampton Roads area.
<b>Baltimore Harbor<sup>3</sup></b>		
Provide recreational fishery for catfish, carp, and eels.	Elevated concentrations of chlordane resulted in a consumption advisory for catfish, carp, and eels.	Baltimore Harbor and Back River.
Improve species diversity and abundance.	Point and nonpoint source loadings of lead and chromium are contributing to reductions in species diversity and abundance.	Baltimore Harbor, Patapsco River, and Back River.

<sup>1</sup> Sources: CBP 1992; MWCOG 1990<sup>2</sup> Sources: CBO 1991; CBP 1993; ACB<sup>3</sup> Sources: ACB; BRCOG 1992



If information was not assembled as part of the Regions of Concern identification procedure, the Regional Action Team will have to gather and analyze data in order to determine priorities for action. However, the evaluation criteria presented in the Chesapeake Bay Program's Chesapeake Bay Regions of Concern identification protocol (see Appendix A) provides a good starting point from which to analyze new data for the ranking characterization. Although the Regional Action Team can select any prioritization procedure, it may be prudent to follow the existing Regions of Concern identification protocol as closely as possible to ensure consistency and resource efficiency. Again, this process should be supplemented with input from the stakeholders (e.g., have they noticed any problems not covered by the Regions of Concern identification process).

If the Regional Action Team decides it does not want to follow the Chesapeake Bay Program's Regions of Concern identification protocol, then it can establish its own ranking procedure. The art and science of ranking and decision-making analysis is a growing field, described in many textbooks, journal articles, and academic courses. Broadly stated, ranking and decision-making analysis is a process to identify the best solution to a problem or to select preferred options (priorities) from multiple choices using predetermined evaluation criteria. The discipline of ranking and decision-making analysis is too broad to discuss in detail in this guidance document; however, Appendix D provides an overview of some of the main techniques used in environmental decision-making. Two additional sources provide more information on these techniques: *Environmental Decision Making: A Multidisciplinary Perspective* (Chechile and Carlisle 1991) and *Geographic Targeting: Selected State Examples* (EPA 1993a). References on facilitating meetings, described in Chapter 3 of this guidance, provide additional background.

## **5.2 IDENTIFYING AND RANKING CHEMICAL CONTAMINANTS AND THEIR SOURCES**

After gaining a sense of which adverse ambient effects are priorities for the Regional Action Plan, it is necessary to identify chemical contaminants, and their sources, that cause or contribute to the adverse effects. For the purposes of developing the plan's implementation approach, it is most important to determine the linkages between sources of chemical contaminants and adverse ambient effects. Most actions proposed in the implementation approach will be targeted at contaminant sources (e.g., urban stormwater runoff, direct discharges from certain industries)—investigations into the types of chemical contaminants should be conducted only to the level of detail needed to credibly identify contributing sources. In some situations, sources of chemical contamination may be obvious from the available background information. In other instances, it may be necessary to carefully identify contaminant types

so that linkages to sources can be made. The level of detail required for this part of the problem definition process will vary on a case-by-case basis.

As described in Section 5.1, the process of identifying an area as a Region of Concern and refining adverse ambient effects has probably involved compiling and assimilating a large volume of information. Some of this information may provide a good starting point for identifying and prioritizing chemical contaminants and sources contributing to the adverse effects. This section describes selected approaches for identifying and prioritizing chemical contaminants and sources so that sufficient information will exist to develop an effective implementation approach. Specifically, this section discusses ways to:

- To verify the nature, extent, relevance, and quality of chemical data available for the Region of Concern
- To associate, but not necessarily statistically correlate, the presence of chemical concentrations with the (possible) adverse ambient effects
- To evaluate the spatial distribution of concentrations of each chemical contaminant
- To identify and target sources of chemical contamination.

To accomplish each of these steps, the Regional Action Team will need to review available ambient (physical, chemical, biological) data on chemical constituents and compare chemical concentrations to standard references, including criteria, standards, and laboratory-generated toxicity data, to provide a measure of contamination severity. The Regional Action Team will also have to compare the relative extent and magnitude of sources using a variety of information and techniques. Prior to initiating any analysis, however, the quality and relevance of available ambient chemical data must be assessed.

### **5.2.1 Identifying Chemical Contaminants**

Information and data to support the identification of chemical contaminants and sources in the Region of Concern may be in a variety of forms. As in the case of assessing adverse ambient effects, a logical starting point for this investigation is to determine what information was assimilated and analyzed as part of the Regions of Concern identification process. Information may also be contained in other data bases (see Appendix C) or in written reports and other technical documents. In some cases, data may not be available, or sufficiently available, to characterize ambient concentrations of all chemical contaminants. In these cases, the Regional Action Team may model theoretic concentrations of these

chemical contaminants using, for example, National Pollutant Discharge Elimination System (NPDES) effluent, modeled nonpoint source, or Toxicity Release Inventory data. This section describes how to (1) assess chemical contaminant data availability/quality and (2) generate "secondary" sources of data, as necessary.

The first activity in developing an information base for chemical contaminants is to determine whether the existing data are sufficient to support the development of Regional Action Plans. The Regional Action Team must assess whether enough data exist to provide the base needed to develop well-conceived strategies to reduce chemical contamination within the Region of Concern. This initial compilation of available chemical data should be undertaken with the objective of quickly identifying key characteristics of the data to enable analysts to assess the extent and coverage of chemical information. The data do not need to be extensive to provide a first-cut overview of data quality, relevance, and sufficiency. Additional data will be gathered throughout the regional action planning process.

This initial data evaluation should be exploratory in nature, offering a broad characterization of the data. The Regional Action Team should be prepared to answer the following key questions:

- Are ambient chemical data available for all toxics of concern?
- Are the data available for one or more exposure routes, water column, sediment, and fish tissue?
- What were the detection limits used in measuring the data? Will data comparability emerge as an issue as a result of differing detection limits?
- How recent are the data? What is the period of record?
- What is the geographic scope of the available data? Does it represent a portion of the Region of Concern or the entire Region of Concern?
- What is the time period associated with the data?
- How many observations were noted for each chemical constituent?
- Were accepted analytical methods used?

The Regional Action Team will face two distinct situations in this early stage. The first situation is when a Region of Concern has been established with little prior data collection to support its designation. The second is when a Region of Concern has been established with prior data collection and analysis as part of the Region of Concern identification process. In each situation, the types of

information necessary to assess data sufficiency are similar. The level of detail needed to develop the final Regional Action Plan, including implementation approaches, however, is more demanding. If the Regional Action Team has data from the Region of Concern identification process, then the level of effort needed to assemble initial data should be reduced greatly.

All data sets should be screened for relevance, extent of coverage, and quality. Exhibit 5-4 provides an example format for organizing the initial data review. Although not necessary to complete the plan, this format summarizes the crucial data elements needed to characterize the extent of chemical contamination within a Region of Concern. By summarizing data in this manner, data quality issues will also be easier to evaluate. While these minimum requirements provide sufficient information to evaluate whether the data exist for a specific chemical contaminant, judging data quality requires further review.

After assembling this basic information and conducting some simple analyses to summarize the data (e.g., distribution, means, medians, ranges, number of nondetects, outliers), the Regional Action Team should have adequate information to identify data gaps and determine geographic areas for which additional data are needed. The preliminary review and analysis also provides the basis for designing additional information collection programs in the field or from other sources. Some judgment and management discretion are required. It is important to remember that the purpose of any additional data collection in the context of the regional action planning effort is to develop a plan for reducing chemical contamination in a specific location. Therefore, extensive surveys and monitoring efforts should not be necessary at this stage. Severe data quality issues should be addressed as part of the Regional Action Plan, however.

The Regional Action Team must evaluate two essential data considerations:

- **Geographic Coverage**—The Regional Action Team should review and evaluate available data to determine whether information is sufficient to characterize and describe the entire Region of Concern. The key objective at this stage is to determine if data gaps exist that will preclude linking problems with contaminants in parts of the Region of Concern.
- **Temporal Coverage**—The Regional Action Team needs to determine whether data are sufficient to describe patterns of chemical contamination over time. Long-term and evolving problems need to be distinguished. This is a crucial component of the ranking process that will assist in determining which chemicals to address in the Regional Action Plan. A good guideline is that the data should cover a sufficient time period to assess seasonal and long-term patterns of chemical contamination.

Exhibit 5-4. Summary Checklist of Factors To Be Considered During Initial Data Reviews

Chemical	Detected?	No. of Observations	Concentration (units)	Media	Location	Collection Date	Detection Limits	Analytical Method	Reference
X <sub>i</sub>	yes/no	e.g., 10	mean	water column, sediment, air, tissue	lat/long or other geographic identifier	m/d/yr	__ mg/l, ppb	e.g., Standard Methods	e.g., Jane Doe (1994)

The number of observations or data points necessary to meet these data quality objectives cannot be fixed. It is important to note, however, that the confidence the Regional Action Team can assign to the problem definition and characterization of chemical contamination relates directly to the available data. The type and variability of summary statistics that will be used to describe the data are calculated, in part, using the number of observations. In addition, the analytical method used to detect and to quantify levels of chemical contamination is a key factor in assessing the accuracy and precision of the reported levels. Because evaluating data quality and analyzing data and information for Regional Action Plans involve so many considerations, it is important that the Regional Action Team contain, or have access to, individuals familiar with using and interpreting data. An ideal candidate, for example, would include a statistician or chemist.

If additional data are needed beyond that which were assimilated for the Regions of Concern identification process (e.g., if the Regions of Concern identification process was incomplete or not done at all), it is recommended that this analysis begin with a review of the Chesapeake Bay Program's Toxics Data Base. As described in Appendix C, this data base contains a significant amount of information on ambient concentrations, including water column and surface microlayer, sediments, finfish, and shellfish. The Regional Action Team may choose to initiate this exploratory data analysis on a location-specific basis, dividing the Region of Concern, for example, by segment codes and/or other location-specific parameters available in the Toxics Data Base.

As a result of data quality conventions established by the Chesapeake Bay Program, many of the common problems encountered in using water quality data have already been addressed in the Toxics Data Base. For example, the detection limits used in all analyses have been recorded. The minimum data elements described previously are standard items in this data base.

In some cases, the Toxics Data Base may not provide sufficient data to support the regional action planning process. For example, data for a specified chemical contaminant may never have been collected or it may not have been collected at location A with sufficient frequency to support a valid analysis. In these cases, the Regional Action Team should develop alternative strategies for building a more inclusive data base. Pooling the data from more than one location, while reducing the site-specific analyses available to the Regional Action Team, may provide a more useful data base for the entire Region of Concern. The Regional Action Team should always consider combining data from a variety of sources to fill data gaps. In other words, the Regional Action Team must use data from a variety of studies, sources, and programs conducted over time and throughout the Region of Concern to build an adequate

information base to develop a strategy to reduce chemical contamination. A well-selected Regional Action Team could be instrumental in providing information. In addition, a number of readily accessible data bases, listed in Appendix C, may provide additional information.

The Regional Action Team may also want to consider accessing and integrating environmental data bases (e.g., Toxics Release Inventory, Permit Compliance System) that are available through the U.S. Environmental Protection Agency (EPA). One available EPA tool is the Environmental Data Display Manager (EDDM), which accesses selected federal data bases to provide information for a number of potential investigations (e.g., identifying river reach segments that are not meeting water quality standards and evaluating the causes for use impairment), performs a number of different analyses, and displays results in several formats (e.g., summary tables or on maps) (see Appendix E).

If ambient data for specific chemical contaminants are not sufficient for conducting further investigations (e.g., comparing ambient data to reference data), the Regional Action Team may choose to supplement the data set with modeled ambient concentrations. Modeling chemical contaminant concentration data should be performed to fill data gaps only where absolutely necessary to support the decision-making process for determining implementation actions. Depending on the level of sophistication, modeling efforts can be very resource intensive. It is important to use this tool only as necessary and to avoid falling into the data analysis trap. Rather than modeling in the chemical contaminant identification and characterization phase of the Regional Action Plan, it may be more appropriate to initiate it later in the planning process or to recommend it as a potential implementation action (see Chapter 7).

If modeling is needed to assess chemical contaminants, many types of input information may be needed, including loadings data (e.g., data from NPDES permit files and the Toxic Release Inventory), and less "direct" information (e.g., procedures for estimating urban runoff, atmospheric deposition, sediment release rates). Again, the Toxics Data Base is a repository for some of this information and includes such data as EPA's Permit Compliance System loadings data for NPDES point source dischargers, extrapolations (by county) of urban runoff loadings of specified chemical contaminants, extrapolations (by basin) of atmospheric deposition loadings, and pesticide usage by county/basin.

Additional information may be available from other federal, state, and local sources. For example, state NPDES files (e.g., NPDES application forms) may provide more complete information on the chemical contaminants contained in a particular discharger's effluent than presented in the NPDES

permit. Knowledge of a particular publicly owned treatment work (POTW) within an industrial user community may enhance the Regional Action Team's understanding of possible contaminants detected in the effluent. Similarly, an understanding of the community's industrial/commercial base should enhance efforts to model runoff quality.

Exhibit 5-5 provides an example for modeling information to determine chemical concentrations. The following materials, among others, provide more information on these procedures:

- *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water—Part I (Revised 1985)* (EPA 1985)
- *Technical Support Document for Water Quality-Based Toxics Control* (EPA 1991a)
- *Technical Guidance Manual for Performing Wasteload Allocations. Book 2, Streams and Rivers* (EPA 1984)
- *Technical Guidance Manual for Performing Wasteload Allocations. Book 4, Lakes, Reservoirs, and Impoundments* (EPA 1986a)
- *Draft Technical Guidance Manual for Performance Wasteload Allocations. Book 3, Estuaries* (EPA 1989)
- *Technical Guidance Manual for Performing Wasteload Allocations. Book 6, Design Conditions* (EPA 1986b)
- *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 1991b)
- *Superfund Exposure Assessment Manual* (EPA 1988).

Modeling approaches for both point and nonpoint sources that are more sophisticated than the example presented in Exhibit 5-5 are available. In the early stages of the regional action planning process, it is presumed that the Regional Action Team would use the "simple method," which is documented in *Controlling Urban Runoff: A Practical Manual For Planning and Designing Urban BMPs* (MWWCOG 1987). During later stages, as implementation actions are prioritized, more advanced models may be appropriate to ensure that the most cost-effective controls are adopted. The type of model to be used will depend, in part, on the hydrologic characteristics of the water body, the types and sources of pollutants, and the desired degree of sophistication of the modeling effort (e.g., simple dilution models, steady state models, or dynamic models). The EPA Center for Exposure Assessment Modeling distributes and supports the use of 21 simulation models and data bases, many of which could be applied to the Regional Action Plan area analyses. *Access EPA* (EPA 1993b) contains information on the center and the 21 models it supports.



## Exhibit 5-5. Example Calculation for Estimating Receiving Water Concentrations

The following example provides a simple method for approximating pollutant concentrations in a water body based on information available for the pollutant sources to the water body. For purposes of the example, we are estimating the pollutant concentration in a river, downstream of the pollutant sources. The example is based on the following simplifying assumptions:

- No provisions are made for the environmental fate of the pollutant; it is assumed to be conservative in the environment and reduced only by the dilution of the receiving water.
- Atmospheric deposition and agricultural runoff do not contribute to the pollutant loading.

## Step 1. Source Scenarios and Load Calculations

Source A - Urban Development	Source B - Industrial Point Source	Source C - Municipal Point Source
Using the Simple Method (MWWOG 1987): $L = [(P)(P_j)(R_v)/12](C)(A)(2.72)$	$L = (C)(Q)(8.34)(D)$	$L = (C)(Q)(8.34)(D)$
Where:	Where:	Where:
L = Annual storm pollutant load (lbs/year)	L = Annual pollutant load (in lbs/year)	L = Annual pollutant load (in lbs/year)
P = Rainfall depth (inches)	C = Long-term average discharge concentration (mg/L)	C = Long-term average discharge concentration (mg/L)
P <sub>j</sub> = Correction factor for storms that produce no runoff	Q = Long-term average flow (MGD)	Q = Long-term average flow (MGD)
R <sub>v</sub> = Runoff coefficient	D = Number of operating days per year	D = Number of operating days per year
C = Flow-weighted mean concentration of pollutant (mg/L)	Example Calculation	Example Calculation
A = Area of site development (acres)	$L = (0.05 \text{ mg/L})(20 \text{ MGD})(8.34)(350 \text{ days/year})$	$L = (0.03 \text{ mg/L})(5 \text{ MGD})(8.34)(365 \text{ days/year})$
Example Calculation	$L = 2,919 \text{ lbs/year}$	$L = 457 \text{ lbs/year}$
$L = [(40 \text{ in})(0.9)(0.30)/12](0.25 \text{ mg/L})(500 \text{ acres})(2.72)$		
$L = 306 \text{ lbs/year}$		

## Step 2: Estimating Ambient Concentration in Receiving Water

Total Load	= (Source A Load + Source B Load + Source C Load)
	= 306 lbs/year + 2,919 lbs/year + 457 lbs/year
	= 3,682 lbs/year
	= 10 lbs/day
C <sub>s</sub>	= (Total Load)(1/Q <sub>s</sub> )(1/8.345)
Where:	
C <sub>s</sub>	= Receiving water effluent concentration (mg/L)
Q <sub>s</sub>	= Receiving water flow (MGD)
C <sub>s</sub>	= (10 lbs/day)(1/40 MGD)(1/8.345)
C <sub>s</sub>	= 0.03 mg/L

### **5.2.2 Identifying Contaminant Sources**

A Region of Concern can be affected by various potential sources of chemical contamination, including point sources (e.g., industrial dischargers, POTWs, combined sewer overflows), nonpoint sources (e.g., agricultural and urban runoff, contaminated sediments, atmospheric deposition), and hazardous and solid waste disposal facilities (active and inactive). At a minimum, the Regional Action Plan should address the possible sources of each chemical contaminant and the method used to identify the source. If the sources can be quantified, the basis of the quantification and the associated rationale should be identified.

Through its efforts to summarize adverse ambient effects and chemical contaminants, the Regional Action Team will probably identify a preliminary list of potential sources of contaminant(s). For example, where ambient chemical information is not widely available and where such data are modeled using point and/or nonpoint source data, the team will come into contact with information on chemical contaminant sources. Using this list as a starting point, the Regional Action Team may review, if necessary, additional information to identify other potential contaminant sources. As a result of regulatory control and planning efforts over the last several decades, a significant amount of information on chemical sources is available to the Regional Action Team. Moreover, many of these data are readily accessed through computerized data bases (see Appendix C).

This section describes information that may be available on potential sources of chemical contaminants according to the following topics:

- NPDES point source discharges
- POTW and combined sewer overflow (CSO) discharges
- Availability of total maximum daily load (TMDL) calculations and waste load allocations (WLAs)
- Use of the EDDM to evaluate point source information
- Active and inactive hazardous and solid waste sites
- Information contained in EPA's Integrated Data for Enforcement Analysis (IDEA) system
- Nonpoint sources of pesticides

- Contaminated sediments
- Urban runoff.

**NPDES point source discharges:** Past regulatory efforts have focused on point source discharges and, consequently, a significant amount of data is available on the chemical contaminants released by these dischargers. NPDES permit files provide the loadings and concentrations of effluent regulated pollutants. In addition, more comprehensive information, addressing pollutants not limited by the NPDES permit, are also available in the NPDES permit file. Many NPDES dischargers (both industrial and municipal) have whole effluent toxicity testing or effluent toxicity limits in their permits. Some permittees have conducted intensive toxicity identification evaluations. Background information on industrial processes, such as that contained in effluent guidelines development documents, may also indicate different chemical contaminants that may be associated with industrial waste streams.

**POTW and CSO discharges:** In addition, contaminants discharged from POTWs may include chemical contaminants detected in industrial, commercial, and residential discharges. While pretreatment POTWs generally have an excellent understanding of significant industrial users discharging to their systems, less is generally known about other users. Nonetheless, many POTWs have developed estimates of industrial, commercial, and "other" flows, which are generally associated with the regulatory requirements to develop local limits. Commercial and residential users may be significant sources of chemical contaminants, especially as POTWs exercise increasing control of industrial users through the application of local limits designed to protect worker health, water quality, and sludge quality. Indeed, many POTWs indicate that the residential sector is providing a greater proportion of remaining loads of certain chemical contaminants. As a result, household hazardous waste programs are often considered a potentially cost-effective alternative to additional chemical contaminant control. Commercial users, including service stations and photo finishing shops, are also viewed with increasing scrutiny. Information on contaminants detected in CSOs, while more variable than that detected in more "traditional" point source discharges, should also be obtained. With EPA's increased emphasis on CSO discharges, POTWs are continually generating increasing amounts of information on contaminants detected in these discharges as a result of revised NPDES permit requirements.

**TMDLs and WLAs:** State agencies may have already made significant gains in assessing the relative contributions of various point and nonpoint sources to the Region of Concern. As a result of longstanding Clean Water Act requirements, TMDL calculations and wasteload allocations (WLAs) may have been initiated or completed. If the Region of Concern encompasses Section 304(l)-listed water

bodies, such water quality studies probably exist. These data should be used to the maximum extent possible.

**Environmental Data Display Manager:** Point source data on industrial and municipal dischargers can be accessed either directly from the Permit Compliance System or through EDDM. Using EDDM, specific water quality segments can be targeted and the system can be searched for point source discharges up or downstream of the discharge within specified distances. In addition, EDDM enables the user to locate hazardous waste sites and public drinking water intakes within specified distances of the water quality segment of concern. Appendix E provides more information on EDDM.

**Active and inactive hazardous and solid waste sites:** Active and inactive hazardous and solid waste sites are another potential source of chemical contaminants. As a result of Comprehensive Environmental Response, Compensation, and Liability Act remedial action studies and Resource Conservation and Recovery Act (RCRA) corrective action studies, a significant body of information exists on chemical contaminants released from these sources. Of particular note are the RCRA facility assessment reports completed at active RCRA treatment, storage, and disposal facilities. These reports summarize potential releases to surface and ground waters from active and inactive units. Information on hazardous waste sites can be gathered from state and EPA files. EPA's Resource Conservation and Recovery Information System and Biennial Reporting System files provide information on the types of hazardous wastes handled at waste sites. This information can be accessed on a state, locality, latitude/longitude, or ZIP code basis.

**Integrated Data for Enforcement Analysis:** The Regional Action Team can review non-enforcement sensitive data from EPA's IDEA system to support the source identification procedure. Through IDEA, multiple EPA compliance data bases can be accessed to identify regulated parties (e.g., Clean Air Act; Clean Water Act; Federal Insecticide, Fungicide, and Rodenticide Act; and Toxic Substances Control Act) within the Region of Concern. Using sorting techniques, for example, all regulated parties within designated ZIP codes that release more than some specified mass of chemical contaminants of concern can be identified. IDEA can be accessed through EPA's Office of Enforcement and Compliance Assurance.

**Nonpoint source pesticides:** Nonpoint sources of contaminants have long been recognized as a source of chemical contaminants. Pesticides are detected in both agricultural and suburban runoff. Golf courses and other recreational activities involving intensive turf management are a potentially

significant source of pesticides. As noted previously, the Chesapeake Bay Program's Toxics Data Base includes estimates of pesticide application by county/basin. Similarly, atmospheric deposition estimates are available from the Toxics Data Base.

**Contaminated sediments:** Another nonpoint source of chemical contaminants is contaminated sediments. By developing models on a site-specific basis, contaminant releases from these sediments can be estimated. As noted earlier, the U.S. Army Corps of Engineers and port authority studies can serve as important data sources for this information. In addition, the Chesapeake Bay Program's Toxics Data Base includes significant data on contaminated sediments.

**Urban runoff:** Urban runoff is another potential source of chemical contaminants. Recent Clean Water Act regulations offer a significant control alternative for this source. The NPDES stormwater regulations, issued in November 1990, require municipalities with populations greater than 100,000 to obtain NPDES permits for their stormwater discharges (55 FR 48062). More than 20 municipalities are regulated in the Chesapeake Bay watershed, including large cities (e.g., Baltimore, Maryland, Washington, D.C., and Richmond, Virginia) and suburban counties (e.g., Montgomery County, Maryland, and Fairfax County, Virginia). State permitting authorities are issuing permits to these municipalities with requirements to implement a comprehensive stormwater management plan that may include both structural and nonstructural best management practices. Industrial activities, including activities on military installations, are also required to obtain NPDES permits for their stormwater discharges. Permits require that these facilities prepare and implement stormwater pollution prevention plans and, in some cases, submit monitoring data. These monitoring data, as well as other information submitted as part of the NPDES application and permitting process, may contain information useful in preparing the Regional Action Plan. State permitting authorities can be contacted to obtain access to this information.

### **5.2.3 Ranking Chemical Contaminants and Sources**

After assembling and analyzing chemical contamination data, it is essential to measure the relative severity or contribution of each chemical and source to adverse ambient effects. This analysis will provide a base level of information needed to prioritize chemicals and sources for the Regional Action Plan's implementation approach.

**Ranking Chemical Contaminants**

In some cases, available information may clearly identify chemical contaminants, provide information on severity, and link the contaminant to a particular adverse effect and/or contaminant source. If such background information is available, it may be relatively easy to evaluate the chemical contaminant. For example, the weight of evidence presented in available technical reports may clearly link chemical contamination from a particular chemical/source to the identified problem. If a link can be made, then comparisons of ambient concentrations of water quality or sediment quality data to prescribed threshold or reference levels may not be necessary. If "indisputable" data are not available, however, but the inventory of available and modeled ambient data indicates the presence of chemical contaminants, then inventory data should be compared to threshold/reference data to assess potential toxicity. Exhibit 5-6 demonstrates this procedure by comparing concentration data to available reference points using protocols similar to those defined for the Regions of Concern identification protocol.

Reference criteria are directly available, or can be derived, from a number of sources. The most obvious sources are the applicable state water quality standards, although other reference levels are being developed (in some locations) for sediments and fish/shellfish tissue. The Chesapeake Bay Program has developed three data bases as part of its overall Toxics Data Base development that summarize the following threshold or reference levels:

- **Chesapeake Bay Water Quality Standards Data Base**—Summarizes water quality standards from each state in the Chesapeake Bay Basin and EPA Region III. The data base also summarizes Chesapeake Bay Program habitat requirements (CBP 1991).
- **Sediment Quality Threshold Compendium**—Contains a comprehensive compilation of federal and state sediment threshold values used to evaluate the toxicity of contaminated sediments.
- **Compendium of Fish/Shellfish Tissue Human Health Protection Values**—Compiles U.S. Food and Drug Administration and other available fish/shellfish action levels.

The Chesapeake Bay Program has also developed habitat requirements for key living resources (CBP 1991). The habitat requirements present numeric guidelines, or thresholds, for selected contaminants and species. The numeric habitat requirement guidelines were developed through an extensive literature review and represent the geometric means of literature values for acute toxicity and chronic or sublethal toxicity to target species. In addition to being published in report format (CBP 1991), the habitat requirements are also included in the Chesapeake Bay Water Quality Standards Data Base.

**Exhibit 5-6. Sample Evaluation to Determine Chemical Contaminants of Concern**

Water Body: Welch Sound, a remote inlet classified as freshwater and designated for primary and secondary recreation and sport fishing.

**I. Available Data**Water Column Concentrations of Chemical Contaminants (Maximum Concentrations)

mercury: 10 ug/l (48 samples)

cadmium: 45 ug/l (48 samples)

phenol: 15 ug/l (48 samples)

Acute Toxicity: No significant difference from control (1 sample)

Sediment Toxicity Data

Acute Toxicity: Mortality is significantly different from control (based on numerous samples in a long-term study).

Chronic Toxicity: Growth is significantly different from control (based on numerous samples in a long term study).

Fish Tissue Information

Fishing advisory is in effect, due to mercury.

**II. Applicable Criteria/Thresholds**State Standards

mercury: 2.4 ug/l (acute), 0.012 ug/l (chronic)

cadmium: 3.9 ug/l (acute), 1.1 ug/l (chronic)

phenol: 100 ug/l (acute), 20 ug/l (chronic)

Ambient Acute Toxicity: Narrative prohibition on toxics in toxic amounts

EPA (Water Column) Criteria

mercury: 2.4 ug/l (acute), 0.012 ug/l (chronic)

cadmium: 3.9 ug/l (acute), 1.1 ug/l (chronic)

phenol: 10,200 ug/l (acute), 2,560 ug/l (chronic)

Ambient Acute Toxicity: 0.3 acute Toxic Units

**III. Comparison to Criteria**Water Column Chemical Analyses

mercury

phenol

cadmium

Results of Comparison

Actual Concern—Exceeds 50% of state standards and EPA criteria for aquatic life.

Potential Concern—Is within 25% of state standard for aquatic life.

Actual Concern—Exceeds 50% of state standards and EPA criteria for aquatic life.

Water Column Toxicity

acute toxicity

Insufficient Data—One data point does not characterize the whole Region of Concern, especially considering that chemical-specific data indicate there probably is ambient toxicity.

Sediment Toxicity

acute toxicity

Actual Concern—Percent mortality is significantly different from the control.

chronic toxicity

Actual Concern—Growth is significantly different from the control.

Fish Tissue Contamination

Actual Concern—Fishing advisory is in effect.

In the absence of applicable state water quality standards, the Regional Action Team could derive protection criteria. One such approach is described in the NPDES regulations. Permitting authorities are required to derive water quality-based effluent limitations using criteria established from relevant information contained in *Water Quality Standards Handbook* (EPA 1993c), risk assessment data, exposure data, information available through the U.S. Food and Drug Administration, and current EPA criteria documents (40 *CFR* 122.44(d)). Other potential sources for criteria development include field and laboratory studies, including the IRIS and AQUIRE data bases that are accessible through the Chesapeake Bay Program's Toxics Data Base. The Regional Action Team may also consider using the methodology recently proposed under the Great Lakes Water Quality Guidance (58 *FR* 20802; April 16, 1993) for the derivation of Tier II criteria. Essentially, the methodology was derived to enable development of criteria with limited data. Although the procedure yields more conservative (i.e., stringent) criteria, it provides a mechanism that ensures that protection criteria can be developed for all chemicals of concern.

Depending on data availability, the Regional Action Team can apply a number of manipulations to assess the potential severity of ambient conditions. While analysts prefer to use the most "powerful" statistical tests available, data may limit the analyst to less powerful tests (e.g., reliance on non-parametric tests as opposed to parametric tests). If data are especially sparse, the Regional Action Team may be reduced to reporting "...only two data points are available at this station. Both data points were generated in the same study during a high flow period in spring 1987. Neither data point exceeded the existing acute water quality standard. However, dischargers within the water quality segment are known to discharge the chemical contaminant and have exceeded permit limits within the last Discharge Monitoring Report (DMR) period."

Comparing chemical contaminant concentrations to various reference points/threshold levels provides one means of assessing the relative risk of the chemical and provides information needed to prioritize chemical contaminants. The Regional Action Team may also want to use other tests of severity to prioritize chemicals. These tests include evaluating the physical/chemical properties of the chemicals of concern. Physical/chemical properties, such as water solubility, vapor pressure, Henry's law constants, organic carbon partition coefficient ( $K_{ow}$ ), and persistence, can be used to determine the potential for these pollutants to be exposed to aquatic life, wildlife, humans, and other pathways. In addition, the propensity for the chemical to bioconcentrate or bioaccumulate and whether the chemical is a carcinogen should also be considered.



Information from assessing all of these measures, supplemented by stakeholder input, can help generate a list of evaluation criteria useful in prioritizing chemical contaminants for action. For example, evaluation criteria might include the following:

- Number of problems/impaired uses linked with the chemical
- Magnitude and duration of exceedance of water quality criteria
- Relative toxicity of the chemical
- Physical/chemical properties of the chemical
- Level of populations to be affected by (exposed to) the chemical.

Appendix D presents various techniques for ranking and prioritizing chemical contaminants. When developing these evaluation criteria, many other factors (e.g., cost, available resources, and technical feasibility) may need to be considered. These will be more of an issue when developing/weighing implementation actions (see Chapter 7). If remediation of certain chemical contaminants is exorbitantly expensive, resource intensive, or technically infeasible, the Regional Action Team may want to consider these factors as part of the evaluation criteria. Exhibit 5-7 demonstrates some of the factors that might be considered when prioritizing chemical contaminants for action.

The Chesapeake Bay Program is also developing procedures for ranking and prioritizing chemical contaminants as part of its commitment to "evaluate and revise as necessary the Chesapeake Bay Toxics of Concern List and the Chesapeake Bay Chemicals of Potential Concern List (1994 *Chesapeake Bay Basinwide Toxics Reduction and Prevention Strategy*). The chemical ranking system incorporates sources, fate, exposure, and effects of chemical contaminants on Chesapeake Bay living resources and human health. The detailed procedures for the ranking system are described in a draft workplan, reproduced as Appendix F of this guidance document.

Chesapeake Bay Toxics of Concern Chemical Ranking System Criteria (Chesapeake Bay Program 1994)	
• Source	• Exposure/Effects
– Loadings	– Water column
	– Sediment
• Fate	– Fish tissue
– Bioconcentration	
– Environmental persistence	

### Ranking Sources of Chemical Contaminants

The Regional Action Team can review existing source data to associate sources with adverse ambient effects to determine the relative extent to which each source contributes to the adverse effect.

**Exhibit 5-7. Example Prioritization for Chemicals To Be Addressed in a Region of Concern****Description of the Region of Concern**

- Periodic, but significant, exceedances of acute and chronic aquatic life water quality criteria for copper.
- Frequent exceedances of acute aquatic life water quality criteria for phenol; periodic exceedances of human health criteria.
- Periodic minor exceedances of chronic aquatic life criteria for mercury.

**Considerations for Prioritization**

- Designated use(s) of the receiving water: Secondary contact and warm water aquatic life uses would focus attention on copper and phenol due to the relatively significant exceedances of criteria as compared to mercury.
- Chemical properties/relative toxicity of pollutants: Mercury has a greater potential to bioaccumulate and biomagnify compared to phenol and copper. Mercury is also relatively more toxic to aquatic life than either phenol or copper.
- Source(s): Phenol and copper are discharged by known point sources; mercury is discharged by nonpoint sources (atmospheric deposition and urban storm water runoff).

**Possible Conclusion**

Phenol and copper become short-term priorities because controls can most likely be quickly identified and implemented. Mercury would be considered the long-term priority due to aquatic life concerns (high relative toxicity) and the uncertainty of sources and controls.

A precise, quantitative assessment of source-specific effects is not necessary to complete this assessment. Assessments can be completed, as needed, throughout the Regional Action Plan implementation process. While an assessment on a loadings basis is not a scientifically valid approach for determining which source may have the greatest effect, using loadings data as a surrogate for effects is appropriate at this stage. Loadings estimates by themselves do not provide much information. However, a comparison of loadings with other environmental aspects, such as critical habitats and species abundance, may indicate cause-effect relationships between chemical contaminant concentrations and impacts.

To evaluate the contributions from sources, several techniques can be used. A relatively simple qualitative approach, such as listing all possible sources of a certain contaminant, may be all that is needed. This type of approach is comparable to the problem assessments performed prior to TMDL development. Alternatively, data could be arrayed geographically in a geographical information system (GIS) or other mapping system. Sometimes, this pictorial evidence may provide enough information to

match adverse effects, chemical contaminants, and sources. GIS is a tool that is especially effective when dealing with large data sets. In addition to mapping, it may be helpful to evaluate loadings with respect to compliance information to determine whether permit limit excursions are contributing significantly to overall loadings.

Frequently, however, more analytical techniques are needed where (1) identification of all potential sources within X miles of the affected site is required and (2) cursory or more refined analyses are conducted to estimate the likely impact of various sources on the subject site. More refined analyses would involve modeling upstream (and upwind) sources on the affected site. The Regional Action Team should use data from any past studies on source-specific impacts, such as WLAs on local point sources, or allocations defining loads from upstream tributaries. The Regional Action Team can also calculate TMDLs, which have been expressed as the sum of the WLAs (i.e., point source loads) and the load allocations (i.e., the nonpoint source loads) plus a margin of safety to account for uncertainty about the relationship between pollutant loads and water quality. Nonpoint sources to be addressed in the TMDL include urban and agricultural runoff, atmospheric deposition, contaminated sediments, and natural background (EPA 1992).

The derivation of TMDLs can range from simple to complex, depending upon the pollutants being controlled and the number and types of sources contributing the pollutants. For simple cases, TMDLs and WLAs can be calculated using simple mass balance equations. As situations become more complex, one of several mathematical models can be used to establish TMDLs, as well as to evaluate alternative WLA scenarios. The Regional Action Team should refer to the *Compendium of Watershed-Scale Models for TMDL Development* (EPA 1992) for further guidance related to mathematical TMDL models.

Generally, these TMDLs and associated WLAs have been more definitive in capturing the magnitude and effects of point sources than nonpoint sources. Nonetheless, these studies, which are often associated with intensive surveys of relevant river segments, can provide useful information for establishing priorities among point sources. TMDL and WLA information is likely to be available in previously water quality-limited segments. As a result of the Section 304(l) listing process and other CWA-inspired water quality assessment activities, significant data may be readily available. Example sources of analytical and flow data necessary to estimate point source loadings include the following:

- Permit Compliance System for monthly monitoring results
- NPDES permit files for monthly Discharge Monitoring Reports

- U.S. Geological Survey water data (for receiving water flows)
- Chesapeake Bay Basinwide Toxics Loading and Release Inventory.

Data related to nonpoint source loadings of toxic pollutants may not be as readily available. In the absence of data, however, the Regional Action Team can estimate nonpoint source loadings by using models. Data inputs needed for calculating nonpoint source loadings vary according to the models being used. The most common models are listed below:

- "Simple Method"
- Hydrologic Simulation Program-Fortran (HSPF) model
- Storm Water Management Model (SWMM).

Of these three methods, the Simple Method is a non-computer model and is the least complex. The Simple Method recommends a series of standard default values for chemical contaminant concentrations in runoff. These concentrations are multiplied by the runoff volumes. *Controlling Urban Runoff: A Practical Manual For Planning and Designing Urban BMPs* (MWCOC 1987) describes the Simple Method. Hydrology textbooks are also appropriate references for calculating runoff volumes (e.g., Veissman et al. 1989). The HSPF model (EPA 1993d) is often used to develop TMDLS. The HSPF model predicts pollutant loadings by modeling numerous point and nonpoint sources. For example, the HSPF model was used to develop the Watershed Model of the Chesapeake Bay, which was developed for nutrient modeling. SWMM (Huber and Dickinson 1988; Veissman et al. 1989) is designed for analyzing urban point source discharges of storm water, but may also be used to analyze nonpoint source runoff quality in an urban area. Input parameters for SWMM include precipitation, temperature, snow melt, surface and subsurface runoff, catchment geometry, and drainage network. The output is in the form of hydrographs to describe the quantity of runoff and pollutographs to show the quantity of individual chemical contaminants. Further guidance related to estimating nonpoint source loadings is presented in the *Modeling of Nonpoint Source Water Quality in Urban and Non-Urban Areas* (EPA 1991c).

When data are limited, it becomes difficult to make good decisions. Estimates of chemical contaminant concentrations are not equal substitutes for actual data. Therefore, rather than ineffectively using resources to develop potentially inaccurate estimates of loadings, resulting in potentially misinformed decisions, it may be more cost-effective to collect data. Analogous to the requirements for a phased-TMDL, the Regional Action Team can establish interim implementation actions concurrent with

data collection activities. Further guidance related to the development of TMDLs and phased TMDLs is provided in *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 1991b). The Regional Action Team can also use the following approaches to evaluate limited data sets if new data cannot be collected:

- Estimate distribution using probability/statistics
- Look at weight of evidence (e.g., if loadings estimates are inaccurate, consider population studies, observations from fishermen, fish tissue concentrations, and number of sources to determine whether a chemical contaminant exists in concentrations that may cause impacts).

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**CHAPTER 6**

**EVALUATING EXISTING MANAGEMENT PROGRAMS**

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## **CHAPTER 6**

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## **CHAPTER 6. EVALUATING EXISTING MANAGEMENT PROGRAMS**

Once the problems being targeted in the Region of Concern have been defined, the Regional Action Team should focus on developing a comprehensive approach to address the problems. This requires an understanding of the capabilities and limitations of existing programs (both regulatory and nonregulatory) to address problems in the Region of Concern. After characterizing the current programs, the Regional Action Team can identify specific actions that may be implemented under existing programs or that require new implementation mechanisms. Chapter 6 focuses on the evaluation of current programs being implemented in the Region of Concern. Chapter 7 builds on this evaluation to identify the specific actions necessary to achieve the objectives for the Region of Concern.

This chapter will assist the Regional Action Team in identifying and evaluating existing programs. Through this evaluation, a Regional Action Team can identify linkages, as well as gaps, between existing programs and Regional Action Plan goals. The chapter is organized according to the following steps for identifying and evaluating the programs that could be used to address the problems in the Region of Concern:

- Identify existing regulatory (e.g., zoning restrictions, discharge permits) and nonregulatory (e.g., recycling centers, voluntary pollution prevention) programs
- Target programs that address the priority problems and goals identified by the Regional Action Team
- Evaluate the effectiveness of the targeted programs
- Synthesize findings
- Present the evaluation in a Regional Action Plan.

### **6.1 IDENTIFYING EXISTING REGULATORY AND NONREGULATORY PROGRAMS**

Numerous organizations administer programs that directly or indirectly affect chemical contaminant loadings to Regions of Concern. Identifying these organizations and their programs is critical to solving problems in any Region of Concern. In addition to federal, state, and local environmental protection agencies responsible for environmental quality, other organizations may be active in addressing chemical contaminant problems:

- Local planning offices have programs on building and development, zoning, growth management, parks, and conservation
- Local public works offices administer trash collection, recycling, wastewater treatment, sewage sludge disposal, road maintenance, vehicle maintenance, and public transportation
- State universities often administer agricultural extension services in cooperation with state departments of agriculture
- Local and regional public and/or business interest groups (e.g., citizen organizations, grassroots environmental groups, chambers of commerce) frequently have education and assistance programs.

Based on their existing knowledge, the Regional Action Team members can probably develop a preliminary list of both regulatory and nonregulatory programs that currently address, or could address, the problems identified. It is critical that the initial list of programs be as comprehensive as possible. Therefore, the Regional Action Team should also solicit input from other stakeholders whose interests may not be represented by Regional Action Team members (see Chapter 3). Stakeholder input at this stage helps ensure a comprehensive starting point and initiates the process of developing support for Regional Action Plan recommendations. Mechanisms used to obtain stakeholder input range from distributing the initial list of programs for review and comment to convening stakeholder roundtable meetings.

Exhibit 6-1 lists examples of existing programs. The programs are organized according to the general problems that they address. The list does not provide the level of specificity that the Regional Action Team and stakeholders would include in the Regional Action Plan for a specific Region of Concern, however.

## **6.2 FOCUSING ON PROGRAMS THAT ADDRESS KEY PROBLEMS**

Once the preliminary list of programs is developed, the Regional Action Team should narrow the list of the programs to be evaluated in order to most effectively utilize resources. The Regional Action Team should focus on the programs offering the greatest potential to support the goals and objectives developed for the Regional Action Plan. The Regional Action Team should use the problem characterization data developed for the Regional Action Plan to further focus this section of the Regional Action Plan on an assessment of the existing regulatory and nonregulatory programs most relevant to the problems in the Region of Concern. For example, if the Region of Concern is being threatened by the deposition of airborne chemical contaminants, the discussion should address programs capable of reducing

**Exhibit 6-1. Examples of Existing Programs That Address Problems Encountered in Regions of Concern**

Problem	Federal Programs	State Programs	Local Programs	Implementation Mechanisms
Direct discharge to water body (point source)	<p>Under the Clean Water Act, all point sources that discharge to U.S. waters must be authorized by a National Pollutant Discharge Elimination System (NPDES) permit (40 CFR Part 122) to discharge conventional, toxic, and nonconventional pollutants. The permit includes the following controls:</p> <ul style="list-style-type: none"> <li>• <b>Technology-Based Controls</b>—Include use of national effluent guidelines limitations and standards for industrial dischargers. Guidelines for conventional pollutants are based on the best conventional pollutant technology; guidelines for toxic and nonconventional pollutants are based on the best available pollutant technology economically achievable. Controls for municipal dischargers are based on secondary treatment standards for biological oxygen demand, total suspended solids, and pH (40 CFR Part 133).</li> <li>• <b>Water Quality-Based Controls</b>—Water quality-based effluent limits required as necessary to protect water quality beyond technology-based controls.</li> <li>• <b>Best Management Practices</b>—Allowed in lieu of effluent limits to control point source discharges to surface waters.</li> </ul> <p>All point source stormwater discharges associated with designated industrial activity and from large and medium separate storm sewers. Coverage includes conventional, toxic, and nonconventional pollutants.</p>	<p>Maryland, Virginia, and Pennsylvania are authorized to implement the NPDES permit program, which they do under state law. These programs regulate point source discharges, including point source stormwater discharges from industrial, municipal, and federal facilities.</p> <p>Pollution prevention assistance is provided through public/private partnerships.</p>	<p>Medium and large municipalities with separate storm sewers regulate point source stormwater from industrial facilities.</p> <p>Some municipalities provide local technical assistance.</p> <p>Emergency response programs can affect point source discharges.</p>	<p>General permits and/or individual permits that include:</p> <ul style="list-style-type: none"> <li>• Discharge limits</li> <li>• Monitoring requirements</li> <li>• Reporting requirements</li> <li>• Best management practices</li> <li>• Spill control and response plans</li> <li>• Pollution prevention plans.</li> </ul>
Indirect discharge to publicly owned treatment works (POTW)	<p>Under the Clean Water Act, all indirect industrial discharges of conventional, toxic, and nonconventional pollutants to POTWs are subject to the following controls:</p> <ul style="list-style-type: none"> <li>• <b>Technology-Based Controls</b>—In the form of national categorical pretreatment standards for industrial indirect dischargers.</li> <li>• <b>Prohibited Discharges</b>—General and specific prohibitions based on General Pretreatment Regulation practices.</li> <li>• <b>Local Limits</b>—Pollutant limits developed by POTWs to protect the collection system, treatment works, worker health and safety, receiving stream water quality, and sludge quality.</li> </ul>	<p>Maryland and Virginia are authorized to implement the federal pretreatment program. Their authorities are outlined in state law. Pennsylvania implements the pretreatment program jointly with EPA.</p>	<p>Local governments implement most pretreatment programs. Their authority is outlined by local sewer use ordinances, state law, and NPDES discharge permits.</p>	<p>Sewer use ordinance. Discharge permits. Spill control and response plans. Pollution prevention plans. Local discharge limits. Monitoring and reporting. Community outreach. Technical assistance to industry.</p>

**Exhibit 6-1. Examples of Existing Programs That Address Problems Encountered in Regions of Concern (continued)**

Problem	Federal Programs	State Programs	Local Programs	Implementation Mechanisms
Combined sewer overflows	<p>Under the Clean Water Act, all combined sewer overflows that discharge to U.S. waters must be authorized by a permit that includes the following controls:</p> <ul style="list-style-type: none"> <li>• <b>Technology-Based Controls</b>—Includes consideration of nine minimum controls.</li> <li>• <b>Water Quality-Based Controls</b>—Water quality-based effluent limits required as necessary to protect water quality beyond technology-based controls. Includes conventional, toxic, and nonconventional pollutants.</li> </ul>	Implementation of state combined sewer overflow strategies.	Implementation of combined sewer overflow controls as directed by NPDES permit.	NPDES permit or other enforceable mechanism, including long-term control plan.
Ambient water quality	<p>The Clean Water Act requires development of water quality criteria for toxic pollutants. States are required to develop procedures for the establishment of water quality standards and provide for the review and revision of those standards. EPA is required to develop national water quality criteria to serve as the basis for state criteria.</p> <p>Currently, water quality criteria are available for protection of aquatic life and human health in surface waters. EPA is developing sediment protection criteria and biocriteria.</p> <p>EPA programs implemented under the Comprehensive Liability Act and the Emergency Response and Compensation Liability Act use water quality standards as action levels for remedial action determinations.</p>	<p>Maryland, Virginia, Pennsylvania, and the District of Columbia develop state water quality standards.</p> <p>Hazardous waste remedial action programs use water quality standards as action levels when appropriate to determine level of cleanup.</p>	<p>Municipalities with pretreatment programs develop local limits for chemical discharges in the sewer system.</p> <p>Volunteer monitoring programs.</p>	<p>NPDES permits through water quality-based effluent limits.</p> <p>Local indirect discharge permits to ensure POTW meets water quality standards.</p> <p>Water quality standards are also used as action levels for remedial actions.</p>
Nonpoint source	<p>Section 319 of Clean Water Act provides funding to assist states in developing nonpoint source programs.</p> <p>Coastal Nonpoint Pollution Control Program enhances state and local efforts to manage land use activities that degrade coastal waters and coastal habitats, including agricultural runoff, urban runoff, silvicultural runoff, hydromodification, and marinas.</p>	<p>Nonpoint source programs.</p> <p>Agricultural assistance programs.</p> <p>Coastal zone management.</p> <p>Department of Transportation road construction and maintenance.</p> <p>Department of Parks and Conservation land management and acquisition.</p>	<p>Household hazardous waste collection.</p> <p>Public education (e.g., storm drain painting, fact sheets).</p> <p>Land use planning and zoning (e.g., set backs, buffer strips).</p> <p>Road and vehicle maintenance.</p>	<p>Management plans.</p> <p>Permits.</p> <p>Zoning rules.</p> <p>Education.</p>

**Exhibit 6-1. Examples of Existing Programs That Address Problems Encountered in Regions of Concern (continued)**

Problem	Federal Programs	State Programs	Local Programs	Implementation Mechanisms
Ambient air quality	National Ambient Air Quality Standards (NAAQS) consist of national primary and secondary ambient air quality standards for criteria pollutants. NAAQS regulate carbon monoxide, particulate matter, sulfur dioxide, nitrogen dioxide, ozone, and lead (40 CFR Part 50).	States are traditionally responsible for implementation through State Implementation Plans and state permits. Clean Air Act amendments require states to adopt permit program for regulated air emissions.	Land use planning and management.  Regional transportation.	Criteria pollutants emissions are controlled through State Implementation Plans and state permit programs. Such plans and permits specify emission levels necessary to meet NAAQS.
Stationary sources of air pollution	National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for asbestos, beryllium, mercury, vinyl chloride, benzene, inorganic arsenic, radionuclides, and coke oven emissions (40 CFR Part 61). The 1990 amendments significantly expanded the NESHAP program to address 189 toxics over 10 years.	States are traditionally responsible for implementation through State Implementation Plans and state permits. The 1990 Clean Air Act amendments require states to adopt permit program for regulated air emissions.	Local governments may participate in Regional Air Boards and other planning initiatives.	EPA sets NESHAPs for different sources or types of operations. These standards are implemented through permits applicable to major sources of these pollutants.
	New Source Performance Standards (NSPSs) set out performance standards for new stationary sources of air pollution (40 CFR Part 60).	State permit programs.	Local governments may participate in Regional Air Boards and other planning initiatives.	Requires the use of best demonstrated emission control technologies.
	Sewage sludge regulations require sewage sludge that is incinerated to meet site-specific limits for lead, nickel, arsenic, cadmium, and chromium, in addition to NAAQS, NESHAPs, and NSPS, when applicable.	States may seek delegation of federal sludge management program; states may regulate through air programs.	Municipal pretreatment programs affect sludge quality.	NPDES or sludge-only permits.
	Title IV of the Clean Air Act amendments of 1990 addresses the emissions of acid rain precursors—sulfur dioxide and nitrogen oxides—from power plants and opt in facilities nationwide. A two-phased program of emissions control and allowance trading is established under 40 CFR Parts 72, 73, 75, 77, and 78.	Response to phased emissions reductions may trigger new source review permitting by state.	Local decisions related to energy conservation and development influence emission rates.	Implemented through a two-phased national program of emissions monitoring and allowance trading. Affected facilities must reduce emissions or acquire allowances to meet permit.

**Exhibit 6-1. Examples of Existing Programs That Address Problems Encountered in Regions of Concern (continued)**

<b>Problem</b>	<b>Federal Programs</b>	<b>State Programs</b>	<b>Local Programs</b>	<b>Implementation Mechanisms</b>
Mobile sources of air pollution	Clean Air Act prescribes emissions standards for moving sources of air emissions (40 CFR Parts 85, 87). Limit tail pipe emissions of non-methane hydrocarbons, carbon monoxide, and oxides of nitrogen from new cars and other vehicles. Clean Air Act amendments of 1990 tighten the controls on motor vehicles and require the production and use of clean fuels.	States implement federal standards.	Local jurisdictions address mobile sources through transportation planning and land use/zoning requirements.	Implemented through federal regulations, state implementation programs, and local requirements.
Contaminated sediments	Under the Clean Water Act, EPA is developing water quality criteria to protect sediment quality. EPA, in cooperation with other regional agencies, has published contaminated sediment management guidance.  EPA also has jurisdiction over the safe disposal of contaminated sediments.  The U.S. Army Corps of Engineers is responsible for management of contaminated sediments that are dredged from navigable waterways.	Some states may have developed contaminated sediment management strategies.	Local land use planning may affect the potential for sediment contamination.	NPDES discharge permits.  Remedial action plans.
Hazardous waste disposal	Resource Conservation and Recovery Act (RCRA) establishes standards applicable to the generation, transportation, and treatment, storage, and disposal of hazardous waste (40 CFR Parts 148, 240-299).  Hazardous wastes include specific wastes that are listed as such under 40 CFR Section 261 Subpart D, as well as other wastes that exhibit one or more EPA-defined hazardous "characteristics," which include ignitability, reactivity, corrosivity, and toxicity (40 CFR Section 261, Subpart C).	States may be authorized to implement the program if as stringent as federal requirements. Forty-eight states and territories are authorized to implement base RCRA program. Joint EPA-state implementation where states are not authorized for complete program. Waste exchange and technical financial assistance to businesses.	Household hazardous waste disposal.  Pretreatment program.  Waste exchange.  Technical and financial assistance to businesses.	Technical standards, notification, and recordkeeping requirements applicable to generators and transporters.  Treatment, storage, and disposal facilities must obtain permits or operate pursuant to interim status.
Ground water quality	RCRA establishes regulatory standards for municipal solid waste landfills establishes criteria defining open dumping, which is prohibited under RCRA Section 4005, and regulates municipal solid waste.  Underground storage tanks of petroleum and hazardous substances (excluding hazardous waste) must meet operation, monitoring, and repair/removal standards for underground storage tanks.  Under the Clean Water Act, the sewage sludge regulations are designed to prevent ground water contamination from sewage sludge that is land applied or placed in surface disposal facility	States implement municipal solid waste landfills criteria through EPA-approved permit or prior approval program.  Wellhead protection program.	Local jurisdictions protect ground water through zoning and land use restrictions (e.g., design codes for septic systems).	State or prior approval program.  Land use and zoning restrictions  Building codes.
Land use	Coastal Zone Management Program establishes state coastal zone management programs to achieve wise use of land and water resources of coastal zone. Land use activities that affect the coastal environment are managed.  Programs designed to address ambient air quality and nonpoint source pollution also address land use planning.	State agencies develop and implement coastal zone management plans.  State Implementation Plans for air quality.  Nonpoint source programs.	Primary authority to control land use.	Local zoning and land use requirements.  Coastal zone management program and special area management plans.

or preventing the emissions of concern (e.g., state air pollution control board, regional transit authority, industries). An exhaustive evaluation of all existing programs should not be an exercise strictly for purposes of drafting the Regional Action Plan document; a targeted evaluation should be an opportunity to identify linkages between the problems and potential solutions. It is critical that the evaluation of individual programs include not only their current actions but also possible other actions consistent with their missions.

Targeting the relevant regulatory and/or nonregulatory programs for addressing problems in the Region of Concern is accomplished by linking the priority problems with programs that appear to have the greatest potential to address them. The Regional Action Team and other stakeholders should work with the information previously generated to define and rank the problems in the Region of Concern when identifying which programs to evaluate. The Regional Action Team and stakeholders should array (perhaps using a matrix) all of the programs identified for each problem (e.g., chemical contaminants, sources, pathways, impacts) and then perform a preliminary screening to select programs and/or organizations offering the greatest potential to address the problems in an effective and timely manner. Once the programs are selected, they should be prioritized for detailed evaluation. The following considerations should be helpful:

- Ability of the program to have a local impact (e.g., a local program controlling industrial discharges to the sewer system may be able to respond more quickly to reduce loadings of chemical contaminants than a state or federal program)
- Ability of the program to respond rapidly (e.g., a program requiring legislative or regulatory changes may be slower to respond)
- Whether the program directly or indirectly addresses the problems
- Whether an obvious gap or deficiency in the program needs to be filled or corrected (e.g., a municipality has not developed or implemented a stormwater pollution prevention plan in a region where urban runoff is a major source of chemical contaminants of concern).

### **6.3 EVALUATING THE EFFECTIVENESS OF PROGRAMS**

The next step is to characterize linkages between existing programs and the Regional Action Plan goals. The purpose of characterizing linkages is to identify partners for implementation, as well as programs or organizations with conflicting missions. The evaluation must provide specific information on how the program is currently addressing the problems in the Region of Concern, the accomplishments of the program, whether the program has encountered any impediments to implementation, and ways to



overcome any impediments. It may be useful to organize each program evaluation by focusing on the (1) authority or mission of the program, (2) tools used by the program, and (3) resources of the program.

The process of evaluating existing programs should create awareness among program managers and staff of both the Regional Action Plan's goals and objectives and of the integral role of key programs in the success of the Regional Action Plan. It is important for the Regional Action Team to recognize that the Regional Action Plan may not be a priority to many programs, even though they exert a great deal of influence over the conditions in the Region of Concern. The Regional Action Team should be careful not to adopt a command and control approach when working to identify linkages with other programs. Through cooperative evaluation, the Regional Action Team can build support for implementing the Regional Action Plan actions. The program evaluation phase of the process may also uncover additional sources of information relevant to Regional Action Plan preparation (e.g., about the problems in the Region of Concern).

### **6.3.1 Program Authority or Mission**

In reviewing the authority or mission of programs, the Regional Action Team needs to understand the legislative mandate, regulatory approach and interpretation, and current implementation. Similar analysis is needed for nonregulatory programs, though the scope is more likely to be described in a charter or mission statement than legislation or regulation. The review should provide information on the extent to which chemical contaminants and associated problems are or are not addressed and the flexibility for initiating actions to support the Regional Action Plan. It is particularly important to identify potential opportunities to expand or refocus the program to incorporate the Regional Action Plan objectives. Exhibit 6-2 lists some basic questions to explore when documenting the program's authority or mission.

#### **Exhibit 6-2. Questions Regarding Program Scope and Mission**

- What are the program's statutory goals and mandates, charter, or mission statement and are they being achieved?
- Are program goals consistent with or counter to the goals of the Regional Action Plan? What is the net result?
- Which sources, activities, or chemical constituents are covered and which are specifically exempted?
- What are the regulatory requirements and what is the rate of compliance and/or what are the non-regulatory commitments and the rate of success?
- What entity has the authority to alter the scope or mission of the program?
- Can the scope or mandate be modified to better target the issues in the Region of Concern?

### **6.3.2 Program Tools**

All programs, whether regulatory or nonregulatory, employ various tools to achieve their goals or mission. Understanding how these tools are used and their effectiveness will help the Regional Action Team understand the possibilities and limitations of an existing program to support the Regional Action Plan recommendations.

All levels of government utilize numerous regulatory tools, including applications, permits, licenses, plans, inspections, monitoring, reporting, and enforcement actions. For example, municipal agencies use a variety of tools to control discharges to the sewage system under their local pretreatment program authorities. At a minimum, municipalities adopt local ordinances that specify conditions for use of the sewer system (e.g., pollutant limits, prohibition of explosive materials, permits required for some discharges). Municipalities develop and issue industry-specific discharge permits for significant industrial users. Frequently, other industrial and commercial users are issued simpler or more generic permits. In addition to establishing limits of chemical contaminants in facility discharges, these permits are opportunities for the municipalities to require industrial or commercial facilities to develop and implement pollution prevention plans; spill prevention, control, and response plans; and employee training programs. Municipalities evaluate and reinforce compliance by conducting inspections and monitoring and by taking enforcement action when appropriate. Inspections provide pretreatment program staff another opportunity to assess facility operations and identify pollution prevention opportunities. In addition to enforcement actions (or to supplement some), many creative tools have been developed to facilitate improved compliance, including the following examples:

- Community-wide source reduction projects, including technical assistance, workshops, and newsletters, targeted to different sectors of the community
- Compliance awards
- Use of penalties to fund source reduction activities.

Nonregulatory tools used by government, public, and private programs frequently involve education and/or technical assistance actions. Nonregulatory programs also serve as a conduit for organizing private sector and citizen action to address regional and local problems. The Regional Action Team should identify the communication or outreach strategy of key nonregulatory programs, including target audience, media, tone, and response. Another type of tool commonly used by nonregulatory programs and increasingly used by regulatory programs is incentives (e.g., grants, tax breaks, subsidies,

and positive public relations). Again, the evaluation should identify the target audience, the techniques for creating the incentive, and the response of the target audience.

Exhibit 6-3 outlines some questions the Regional Action Team may explore in documenting the effectiveness of regulatory and nonregulatory tools used by existing programs that address problems in the Region of Concern.

#### **Exhibit 6-3. Questions Regarding Program Tools**

- What tools are employed by the program?
- Who or what activities do these tools target?
- Are procedures for implementing tools efficient?
- Do these tools effectively reach all members of the targeted community?
- Is there a means to measure their effectiveness?
- Could these tools be an effective mechanism for addressing problems in the Region of Concern?
- Could existing programs adopt new or modified tools to implement the Regional Action Plan?

#### **6.3.3 Program Resources**

Examination of program resources extends beyond the level of funding and staffing to organizational efficiency. Evaluating standard operating procedures for implementing program tools is useful for identifying opportunities and obstacles to linking existing programs with implementation of Regional Action Plan recommendations. For example, the Regional Action Team could evaluate the program approach for identifying its target or regulated community, the way tools are applied, and tools for measuring and ensuring program effectiveness or compliance. Exhibit 6-4 suggests specific questions for exploring program resources.

#### **Exhibit 6-4. Questions Regarding Program Resources**

- Does the program have adequate resources to achieve the goals of the program (i.e., to implement the program as it is designed)?
- Does the program have resources to evaluate whether the program is achieving its goals?
- How is the program funded?
- What is the mix of skills and expertise of program staff?
- Could the existing program be modified to better achieve the goals of the Regional Action Plan within the existing resources or if new or modified funding mechanisms were available?
- Is the program willing to commit, in writing and action, to implementing the goals of the Regional Action Plan?

## **6.4 SYNTHESIZING FINDINGS**

After evaluating the effectiveness of key regulatory and nonregulatory programs, the Regional Action Team and stakeholders should discuss the findings. This discussion should focus on four issues:

- Documenting linkages among regulatory and nonregulatory programs and problems in the Region of Concern
- Resolving gaps where problems in the Region of Concern are not addressed by existing programs
- Improving the effectiveness of existing programs so that individual programs better target problems in the Region of Concern
- Coordinating programs to improve the efficiency with which combined resources are applied to solving problems in the Region of Concern.

The outcome of the discussion should be specific recommendations and commitments to adopt them.

## **6.5 PRESENTING THE EVALUATION IN THE REGIONAL ACTION PLAN DOCUMENT**

The Regional Action Plan should document the process of identifying and evaluating existing programs. The full range of programs identified for each problem should be listed. If the list is very long, it can be placed in an appendix. Documenting this initial list in the Regional Action Plan keeps it available for future reference.

The Regional Action Team should identify the programs selected for detailed evaluation, as well as the reasons for their selection, and document the findings of the evaluation. The contributions that a program can make to the goals of the Regional Action Plan should be assessed in either a table or a couple pages of text. Each program assessment should include a description of the authority or mission of the program, tools used to implement the program, and resources dedicated to program implementation and evaluation. The program assessments most valuable function is to describe the problems and sources of problems that are, or could be, addressed by the program. If program gaps were identified, the Regional Action Team should include recommendations for addressing these gaps.

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## **CHAPTER 7**

### **APPROACH TO DEVELOPING IMPLEMENTATION ACTIONS TO ACHIEVE THE GOALS OF THE REGIONAL ACTION PLAN**

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## **CHAPTER 7**

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## **CHAPTER 7. APPROACH TO DEVELOPING IMPLEMENTATION ACTIONS TO ACHIEVE THE GOALS OF THE REGIONAL ACTION PLAN**

Previous chapters of this document provide guidelines to the Regional Action Team and the stakeholders on establishing goals and objectives, reviewing evidence of problems, ranking problems and sources, and evaluating existing programs. The purpose of this chapter is to assist the Regional Action Team in taking the next step—developing implementation actions to achieve the goals and objectives of the Regional Action Plan. In doing so, the Regional Action Team will need to:

- Identify the universe of applicable implementation actions, both regulatory and nonregulatory, that can address specific problems and help achieve stated goals.
- Evaluate and select the most appropriate implementation actions based on factors such as technical feasibility, cost, financing, incentives, and public support.
- Assign responsibility and track progress.

This chapter provides guidelines for addressing each of these points. This chapter assimilates information from the two previous chapters to develop feasible implementation actions using existing programs to address priority problems in the Region of Concern. This chapter outlines one approach, although any approach developed by the Regional Action Team is welcomed as long as it fully considers all possible implementation actions, provides a rational process for selecting the most appropriate implementation action, and presents a scheme for ensuring that implementation actions move to successful completion, facilitating full achievement of goals and objectives established for the Region of Concern.

Before presenting the suggested approach to developing implementation actions, it is important to note that implementation of the Regional Action Plan will involve coordinating individuals, organizations, and programs. It is highly unlikely that one, or even a few, implementation actions and implementing entities will represent the total Regional Action Plan implementation effort. As noted throughout the Chesapeake Bay basin, improving Bay water quality depends on the efforts of government, industry, and the public at large. This reinforces the need to leverage the creative energy and resources of multiple organizations and individuals.

Within this framework, "community-wide action" (i.e., where stakeholders throughout the community get involved in Bay restoration) is a useful paradigm for Regional Action Plan implementation. Community-wide action, in the context of a Regional Action Plan, would distribute

responsibilities for implementation among all relevant stakeholders: industrial/commercial facilities, government facilities, public interest groups, households, and regulators. In this way, all members of the stakeholder community are engaged in the return of the resource, and all are provided with an opportunity to take part in achieving the goals and objectives established for the Region of Concern.

## **7.1 IDENTIFYING ALL APPLICABLE ACTIONS**

The purpose of this section of the Regional Action Plan is to define all possible implementation actions necessary to achieve established goals and objectives in the Region of Concern (see Exhibit 7-1, which defines the relationship among goals, objectives, and implementation actions). As noted in Chapter 4, each goal will probably have multiple objectives. Each objective, in turn, will probably involve numerous implementation actions. Individual implementation actions may address multiple sources of chemical contaminants, and individual sources may require multiple actions. When identifying all applicable implementation actions, the Regional Action Team should include:

- Regulatory and nonregulatory actions
- Activities throughout every stage of the implementation process, from conducting further studies to evaluating the success of an action
- Projects already underway, as well as those not yet initiated
- Actions required under existing federal, state, and local law, as well as projects traditionally beyond the reach of statutory/regulatory control.

If the Regional Action Team has been established appropriately (see Chapter 3), it will be able to build a fairly comprehensive inventory of implementation actions based on members' knowledge of the problems and sources, the community's socioeconomic base, and the available regulatory and nonregulatory programs, as well as technical control alternatives. Nonetheless, when building an inventory of all applicable actions, the Regional Action Team should consult with state and local regulatory officials, planning and zoning agencies, resource management agencies, public utility officials, community and business leaders, and other individuals, as appropriate, to identify currently active and planned projects. Appendix G contains a matrix illustrating example implementation actions and various entities that could contribute to their implementation.

In some cases, the list of implementation actions applicable to a specific problem may be fairly narrow. For example, if aromatic hydrocarbons are impairing the commercial and sport fishery and



**Exhibit 7-1. Relationship of Goals/Objectives to Applicable Actions\***

<b>Goal</b>	<div><b>Goal I</b></div> <div>Restore recreational fishery in the Attaboy Creek.</div>
<b>Objective</b>	<div><b>Objective A</b></div> <div>Reduce elevated concentrations of metals and organics affecting shad health and propagation.</div>
<b>Actions</b>	<div><b>Actions A.1-A.x</b></div> <div> <ol style="list-style-type: none"> <li>1. Conduct analyses to develop total maximum daily load (TMDL) for stream segment.</li> <li>2. Conduct data collection effort to assess current loading from point and nonpoint sources (e.g., industrial and municipal dischargers, agricultural runoff, urban runoff, atmospheric deposition, and sediment source loading contributions).</li> <li>3. Determine necessary reductions from point and nonpoint sources to meet TMDL.</li> <li>4. Implement necessary reductions through: <ul style="list-style-type: none"> <li>- Review National Pollutant Discharge Elimination System (NPDES) permits as they come up for renewal</li> <li>- Revise NPDES monitoring requirements and limits, as necessary</li> <li>- Recalculate local limits for pretreatment publicly owned treatment works as necessary</li> <li>- Conduct pollution prevention outreach seminars</li> <li>- Investigate opportunities for integrated pest management with agricultural extension agents</li> <li>- Assess opportunities for household hazardous waste programs.</li> </ul> </li> </ol> </div>

contaminated sediments represent the overwhelming contribution of aromatic hydrocarbons to the system, then the list of applicable actions may be narrowed to this source. Even in this situation, however, the use of various control authorities may be possible: Resource Conservation and Recovery Act corrective actions, Comprehensive, Environmental Response, Compensation, and Liability Act remedial actions, and U.S. Army Corps of Engineers maintenance dredging. Within each of these authorities, different remediation techniques can be considered, including upland disposal and innovative bioremediation techniques.

In other cases, the list of applicable implementation actions may be broad. For example, if the chemical contaminant is relatively ubiquitous, such as lead, then the potential sources, control authorities, and control techniques may be numerous. The Regional Action Plan might recommend several phases of implementation actions, including (1) immediate action to control major sources, (2) initiation of an analysis of the relative contribution of other sources, and (3) evaluation of the efficiency of actions targeted as lesser sources.

At the conclusion of the initial review of available alternatives, it is recommended that the Regional Action Team prepare a preliminary inventory of implementation actions and circulate the list to key stakeholders and recognized experts for comment and revision. Because the list will be subjected to the evaluation process described in Section 7.2, developing a broad and creative list of applicable implementation actions is recommended at this stage of the process.

To illustrate the myriad of implementation actions being considered, the Regional Action Team may choose to use tabular displays as an organizing framework. Consistent with the framework of tying actions to goals and objectives, as described in Exhibit 7-1, Exhibit 7-2 illustrates one means of displaying all applicable actions under consideration. The exhibit lists alternative actions for achieving a specified goal (return the recreational fishery) and a specified objective (reducing effects of lead on shad health and propagation). Preparing lists of potential implementation actions for each specified objective by geographic location and chemical contaminant may result in redundant entries. However, this approach enables the Regional Action Team to address each objective so that each problem, each geographic area, and each source of contamination is given careful consideration. Summary table formats can be arranged in many ways, including by chemical contaminant type and source category.

Once the preliminary inventory of implementation actions meets the expectations of the Regional Action Team and, as applicable, peer reviewers are identified, it is recommended that the Regional Action

**Exhibit 7-2. Potential Implementation Actions for Improving Shad Fishery at Attaboy Creek:  
Elevated Concentration of Lead in Fish Tissue\***

<b>Goal:</b> Restore recreational fishery in the Attaboy Creek		
<b>Objective:</b> Reduce elevated concentrations of lead so that the health and propagation of shad can be restored		
<b>Contributing Sources</b>	<b>Potential Implementation Actions</b>	<b>Responsible Parties</b>
Publicly owned treatment works (POTW)	Develop water quality-based permit limits	National Pollutant Discharge Elimination System (NPDES) Authority (state/EPA)
	Develop technically based local limits for application to industrial users	POTW Pretreatment Program
	Calculate loading and associated influent concentrations from commercial and residential sources	POTW Pretreatment Program
	Implement lead reduction program across sewer users	POTW Pretreatment Program, municipal public works, business associations
Municipal solid waste disposal operations	Separate lead acid batteries by source prior to disposal/incineration	Municipal solid waste authority, commercial waste management, industry associations
Recreational fishermen	Establish outreach/replacement program to reduce lead-based fishing tackle	Park authority/public interest groups, tackle stores
Coal piles associated with power generation	Cover coal piles, reduce runoff potential	Utilities, industrial/commercial sector, state/local water management program
Urban/suburban runoff	Improve best management practices, including frequency of street sweeping and maintenance of catchment basins	Municipal public works, state/local planning and zoning authorities
Drinking water lead service lines	Accelerate replacement of lead service lines in older residential neighborhoods, reducing residential contributions to POTW; coordinate with street repair	Public utility/municipal public works

\*Items listed are for illustrative purposes only; this list is not intended to be comprehensive.

Team invite wider public participation in the review and modification of the list of potential implementation actions. As noted throughout this document, the need to leverage the resources of government agencies, the private sector, public interest groups, and the general public is paramount to successful implementation of the Regional Action Plan.

## **7.2 EVALUATING AND SELECTING THE IMPLEMENTATION ACTION(S)**

The Regional Action Team should develop a procedure for identifying the most appropriate or priority implementation actions from among all those identified. This procedure should include a full definition of the evaluation criteria and the decision-making process that the Regional Action Team expects to use in selecting the most appropriate actions, so that stakeholders understand, from the beginning, the basis of subsequent decision-making. When appropriate, the Regional Action Team should develop preliminary screening criteria in addition to the evaluation and selection criteria. A preliminary screening may be necessary if the inventory of actions is too large to allow complete evaluation given available resources.

In addition to identifying a range of activities that may be implemented, the Regional Action Plan should offer an approach for assessing which actions may be more appropriate than others based on the action's feasibility and its ability to address problems. Feasibility is influenced by technical limitations, cost, financing incentives, and public support. This section describes seven criteria that the Regional Action Team can use to evaluate implementation actions:

- Relationship of the action to the problem
- Technical feasibility
- Cost
- Financing options
- Incentives (regulatory and nonregulatory)
- Public support
- Indicators for measuring progress.

The Regional Action Team is responsible for developing the decision-making framework, including selecting the factors to be included in the framework and the interaction of those factors in the decision-making process. The Regional Action Team can choose any combination of factors in assessing implementability. This list is not meant to circumscribe the Regional Action Team's consideration of additional factors. Some implementation actions may require the Regional Action Team to consider

factors not described herein, such as actions requiring changes in the state's statutory authority. In these cases, the likelihood of legislative support will need to be gauged.

In addition, the Regional Action Team may "score" the actions in order to establish a hierarchy for implementation or for more detailed evaluation. This scoring can be done using an explicit scoring approach, where the implementation action is given a high, medium or low score for each criterion. Exhibit 7-3 illustrates this scoring technique. The Regional Action Team can also differentially weight the various criteria, so that, by way of example, the relationship of the action to mitigating the use impairment is given greater value than cost considerations. Appendix D provides additional information on techniques for ranking and prioritizing.

### **7.2.1 Relationship of the Action to the Problem**

Chapter 5 covers the topic of identifying the relative severity of chemical contaminants or contribution of different sources associated with Region of Concern problems. The chapter also presents techniques to rank the sources of pollutants for action. When developing an implementation approach, it is important, as one evaluation criterion, to address the priority sources of contamination. Using the information evaluated as part of Chapter 5, the Regional Action Team should assess the relative extent to which each source contributes to the problem(s). A precise, quantitative assessment of source-specific effects is not necessary. More complete assessments can be conducted, as needed, while the Regional Action Plan implementation process proceeds. Exhibit 7-4, suggests questions to consider when evaluating the relationship of the action to the problem.

### **7.2.2 Technical Feasibility**

The purpose of this aspect of the analysis is to identify whether or not the identified actions are technically feasible. In some cases, the Regional Action Team may label the feasibility of the approach as "unknown" or "to be investigated." Technical infeasibility should *not* be confused with whether or not the technology is reasonable from a cost perspective. Cost factors are addressed in Section 7.2.3. Exhibit 7-5 contains several questions that can be considered when evaluating the technical feasibility of a proposed implementation action.

While these questions and the remainder of this section target reviews of the technical feasibility of engineering approaches, similar questions should be considered when evaluating the technical feasibility of other types of implementation actions. For example, the sampling designs or approaches for

Exhibit 7-3. Summary of Evaluation of Implementation Actions

Goal I: Returning Recreational Fishery  
Objective A: Reducing Elevated Metals Concentrations  
Actions: Point Source Reduction Actions

Implementation Action	Evaluation Criteria							Comments
	1	2	3	4	5	6	7	
1. Reduce metal loadings from industrial point sources	●	■	■	■	○	■	○	Industrial sources already reducing to best available technology; further reductions may prove more beneficial elsewhere. Feasibility/cost impact not expected to be an issue, dependent on stringency of "new" limits. Public support not likely to emerge as an issue unless limits result in plant closures, unemployment.
2. Reduce metal loadings from publicly owned treatment works	●	■	■	■	■	■	○	Technical feasibility not expected to be a concern. Limits on commercial users are expected to result in reductions and that they can be achieved by adapting good housekeeping measures.
3. Reduce metal loadings from urban runoff	●	●	●	●	●	●	■	No urban runoff control program currently in place. Program adoption requires establishing administrative framework and financing new program. Technical feasibility of controls needs to be established.
4. Reduce metals loading from atmospheric sources	●	●	○	■	○	○	○	Oncoming Clean Air Act regulatory requirements may provide sufficient controls.

Key: ● High  
■ Medium  
○ Low

Evaluation Criteria:

- |                                     |   |
|-------------------------------------|---|
| 1 Relationship of Action to problem | 5 Regulatory and nonregulatory incentives |
| 2 Technical feasibility             | 6 Public support                          |
| 3 Cost                              | 7 Indicators for measuring progress       |
| 4 Financing                         |   |

**Exhibit 7-4. Questions for Evaluating the Relationship Between the Action and the Problem**

- Does the action target a priority problem?
- Does the action target a priority source?
- Will the action have a direct impact on the problem?
- What is the magnitude of impact of the action on the problem?
- What is the timeframe for implementation of the action?
- What is the timeframe for measuring the results of the action?

**Exhibit 7-5. Questions for Evaluating Technical Feasibility**

- Does the technology or practice exist to implement the action?
- Is the technology or practice commonly used?
- Is the technology or practice readily available?
- Are any negative side effects associated with the technology or action (e.g., transfer of pollutants across media, or generation of different pollutants)?

developing total maximum daily loads can also be evaluated from a technical feasibility perspective. Questions might include what data will be necessary to develop a complete survey, what assumptions will need to be made, and how reliable the resulting analysis will be.

As a result of the continued demand for pollution control and remediation technologies, innovative environmental technologies are constantly being developed. Some of these technologies may be applicable to problems in the Region of Concern. Technology performance depends on factors including space limitations, energy requirements, product specifications, and pollutant concentrations. Consequently, the Regional Action Team will need to use both site-specific information about the source category and technical literature to determine whether the action can be applied in the local situation. To illustrate this kind of evaluation, Exhibit 7-6 provides an example of contaminated sediments and potential sediment remediation. The example is not meant to provide sufficient rigor to allow for evaluating the use of sediment remediation technologies in a site-specific situation. Readers are directed to texts and experts in the field for site-specific evaluations. This exhibit is provided as an overview of the types of factors that need to be considered when assessing technical feasibility, specifically in evaluating sediment remediation technologies.

Pollution prevention technologies are important actions meriting review with regard to this criterion. Commonplace pollution prevention techniques, such as good housekeeping approaches,

**Exhibit 7-6. Example of Evaluating Technical Feasibility:  
Contaminated Sediment Remediation**

Technology	Availability	Feasibility
Removal and placement in confined disposal facility (CDF)	Well-developed and widely used.	Requires participation of local and state authorities for site location. Also entails long-term maintenance responsibilities. Placement of CDFs near populated areas may attract "Not in My Backyard" opposition. Requires significant public outreach.
Open-water disposal	Only applicable to uncontaminated and very slightly contaminated sediments. May be used for slightly more contaminated sediments if combined with capping.	Protocols for determining suitability of sediments for open-water disposal are well-developed at the national (e.g., the EPA/Corps Green Book) and regional (e.g., Region V guidelines) levels.
In-place capping	Degree of usage not known.	Applicable to sediments in fairly quiescent waters. May require long-term maintenance and monitoring.
Removal and upland placement	Well-developed and widely used.	Requirements similar to those for CDFs.
Application of contaminant removal and treatment technologies, such as: <ul style="list-style-type: none"> <li>• Thermal destruction</li> <li>• Chemical conversion</li> <li>• Biodegradation</li> <li>• Chemical extraction</li> <li>• Soil washing</li> <li>• Solidification/Stabilization</li> </ul>	Under various levels of development.	Most require removal and dewatering or other pretreatment. Costs run from moderate to prohibitive.

chemical substitution, and raw material recovery, are well-known throughout industry and, in many cases, can be transferred to other industries. However, many pollution prevention technologies involve redesigning production processes and even final products. Many industries may be reluctant to invest in pollution prevention technologies, because, for example, product substitution techniques may detract from overall product quality or financial incentives favor waste treatment technologies. In addition, individual companies may be reluctant to share trade secrets/production patents with competitors, even if pollution prevention opportunities accrue. Consequently, in considering the potential reductions that one might gain from pollution prevention approaches, the Regional Action Team will need to work closely with the industrial, commercial, and government sectors.



**7.2.3 Cost**

A key variable that the Regional Action Team should consider when choosing among alternatives is the cost of each implementation action. The Regional Action Team should identify the economic issues, as well as the level of precision about the costs of implementation actions that will be addressed during Regional Action Plan development. Several factors need to be considered when evaluating costs, as indicated by the questions presented in Exhibit 7-7. Before committing to answering these questions during the Regional Action Plan development process, the Regional Action Team should understand the activities involved. Evaluation of costs ranges from a simple order of magnitude estimate to a detailed cost-benefit analysis. Both levels of cost estimates provide valuable information for evaluating and selecting implementation actions to the Regional Action Team. The Regional Action Team should consider which level of analysis is appropriate and may decide that both should be applied at different stages in the process of evaluating and selecting implementation actions.

**Exhibit 7-7. Questions for Evaluating Costs of Actions**

- What is the life-cycle cost of the action, including capital costs, operation and maintenance costs, and avoided costs?
- Can an alternative action deliver similar, or greater, benefits at a lower cost?
- Who will pay for implementation?
- Are there mechanisms to provide financial assistance to those who are expected to participate in implementing the action?
- Will the action under consideration impose "unacceptable costs" on the firm or community?
- What is the expected return, or benefit, on the investment?

One example of an approach for evaluating the costs of potential implementation actions is that being used for the Elizabeth River Regional Action Plan. The Virginia Department of Environmental Quality is proposing to apply two levels of cost categories when evaluating implementation actions. Level 1 is designed to be used as part of a preliminary screening of the initial inventory of implementation actions. After the priority implementation actions are selected, the Level 2 cost categories are applied using a more quantitative evaluation of the costs associated with the implementation action. Exhibit 7-8 summarizes the suggested cost categories.

The following paragraphs provide a general overview of three more rigorous analytical techniques for evaluating economic issues: economic achievability analysis, cost-effectiveness analysis, and benefit-cost analysis. The Regional Action Team will need to determine whether and how it plans to use each of these three types of economic analyses in assessing which implementation actions may be most

Exhibit 7-8. Cost Categories

Level		Dollars
1	2	
Very low	1	< 10,000
	2	10,000 - 50,000
Low	3	50,000 - 100,000
	4	100,000 - 250,000
Medium	5	250,000 - 500,000
	6	500,000 - 750,000
	7	750,000 - 1 million
High	8	1 - 5 million
	9	5 - 10 million
Very high	10	10 - 25 million
	11	25 - 100 million
	12	> 100 million

"appropriate." The most expensive action may be the most likely to achieve the objectives and goals, but taking such an action will depend on whether it is justifiable and understandable to the stakeholders. Exhibit 7-9 defines each of these economic techniques and how each is commonly used in evaluating projects.

One of the most commonly used techniques in evaluating environmental expenditures is the economic achievability test. (See the *Work Book for Determining Economic Achievability for National Pollutant Discharge Elimination System Permits* [EPA 1982].) Using this technique, regulatory officials can assess the impact of a given pollution control expenditure on the firm's balance sheet and/or the community's tax burden. This technique does not address the value of the benefits derived from the

Exhibit 7-9. Overview of Economic Techniques

Technique	Definition	Use in Evaluating Pollution Control Expenditure
Economic achievability	Financial analysis of the affordability of capital investments at the plant and/or community level	Used to determine cost impacts of point source controls on the affected plant's balance sheet and/or community's tax burden
Cost-effectiveness analysis	Systematic analysis that compares cost among alternative means to achieve the same objective	Used to identify least expensive alternative to achieving a specified reduction (e.g., reduce cadmium loadings by half)
Benefit-cost analysis	Investigation to assess whether investments are justified based on expected societal benefits accrued in short- and long-term	Used to evaluate the impact of large-scale investments or projects to select the project resulting in the greatest benefit-cost ratio, including the "no-action" alternative

expenditure; however, it does answer a very real question of interest to stakeholder: How will this cost affect my pocketbook?

Cost-effectiveness analysis can be used to assess alternative implementation actions for achieving the same objective at a single site (e.g., identifying the least expensive alternative for reducing metal loadings to a publicly owned treatment works [POTW]) or across sites (e.g., evaluating whether urban nonpoint source control or more stringent POTW National Pollutant Discharge Elimination System [NPDES] limits can achieve metals loading reductions at lesser cost). The need to place dollar values on intangible environmental benefits is reduced in cost-benefit analysis, because benefits are assumed to be constant across the alternatives being evaluated. Cost-effectiveness analysis employs life-cycle analysis to quantify the direct (e.g., capital cost, operation and maintenance) and indirect (e.g., avoided waste disposal costs) costs anticipated over the life of the alternative projects.

Benefit-cost analysis is usually used to evaluate large-scale investments or infrastructure projects. This technique presents many practical problems for environmental projects, the most obvious being that it is difficult to calculate monetary benefits accurately, such as the value of a recreational fishery. Consequently, benefits are often underestimated because factors that influence their value cannot be quantified objectively and are ignored. While it is not recommended that the Regional Action Team expend the resources to perform benefit-cost analysis for each implementation action (e.g., controlling urban runoff from a particular site), it may want to consider the use of benefit-cost analysis in evaluating the benefits of the entire "package" of actions.

Each method of analysis requires different data inputs, but all share the need for basic costing information:

- What are the capital costs associated with the project?
- What operation and maintenance costs can be expected?

Exhibit 7-10 provides examples of variables that generally must be considered in a costing exercise. It also lists reference manuals that can be used in generating cost estimates. For example, costs for remediating contaminated sediment can be obtained from vendors of the technology and, for more standard techniques, engineering texts can be consulted. Typical variables used in estimating the cost of sediment projects include the volume of sediment to be pumped (including water content), the number

**Exhibit 7-10. Primary Variables of Concern and References/Contacts  
for Key Source Categories**

Source Category	Primary Costing Variables	References/Contacts
Industrial sources	Wastewater volume and variability, pollutants of concern, influent concentrations and variability, desired effluent concentration, residual generation and management, existing treatment processes (including upgrade capabilities), energy costs, pumping requirements, land availability	<ol style="list-style-type: none"> <li>1. Specific wastewater treatment system vendors (lists available from sources such as <i>Pollution Equipment News</i> Buyers' Guides, <i>American Chemical Society</i> Environmental Buyers' Guides).</li> <li>2. EPA Office of Science and Technology Effluent Guidelines industry-specific Development Documents and contacts.</li> <li>3. EPA Office of Research and Development Risk Reduction Engineering Laboratory Treatability Database (Version 4.0).</li> <li>4. Engineering News-Record Construction Cost Index.</li> <li>5. Metcalf and Eddy, Inc., McGraw-Hill Series in Water Resources and Environmental Engineering (particularly, <i>Wastewater Engineering</i>).</li> <li>6. Robert Snow Means Company, indices for unit price estimating (i.e., The Means Index).</li> <li>7. EPA's Pollution Prevention Information Exchange Systems.</li> </ol>
Municipal wastewater treatment plants	Wastewater volume and variability, organic and solids loadings, pollutant influent loadings, energy costs, effluent limitations, sludge generation and management, existing treatment processes, geographic location, land availability	<ol style="list-style-type: none"> <li>1. EPA Sewer Construction and Sewage Treatment Plant Construction Cost indices.</li> <li>2. Sources 1, 5 and 6 from above.</li> </ol>
Urban nonpoint sources	Percent impervious surfaces, volume average and peak of stormwater, pollutant concentrations, development density (availability of land for retrofit structural practices), staff to inspect maintenance of structural practices	<ol style="list-style-type: none"> <li>1. EPA. 1993a. <i>Guidance for Specifying Management Measures for Sources of Nonpoint Pollution on Coastal Waters</i>. EPA 840-B-92-02.</li> <li>2. Metropolitan Washington Council of Governments. 1992. <i>A Current Assessment of Urban Best Management Practices: Techniques for Reducing Non-Point Source Pollution in the Coastal Zone</i>.</li> </ol>
Agricultural sources	Volume of agricultural chemicals handled onsite, access to mixing pad	<ol style="list-style-type: none"> <li>1. Soil Conservation Service Local and District Offices.</li> <li>2. EPA. 1993a. <i>Guidance for Specifying Management Measures for Sources of Nonpoint Source Pollution</i>. EPA 840-B-92-02.</li> </ol>
Contaminated sediments	Location, volume, pollutant concentration	<ol style="list-style-type: none"> <li>1. National Academy of Sciences. 1989. <i>Contaminated Marine Sediments-Assessment and Remediation</i>. Washington, DC: National Academy Press.</li> <li>2. EPA. 1993b. <i>Selecting Remediation Techniques for Contaminated Sediment</i>. EPA 823/1393/001.</li> <li>3. EPA. 1993c. <i>Assessment and Remediation of Contaminated Sediments (ARCS) Program Assessment Guidance Document</i>. EPA 905-R-94-002.</li> <li>4. EPA. 1993d. <i>Assessment and Remediation of Contaminated Sediments (ARCS) Program Remediation Guidance Document</i>. EPA 905-R-94-003.</li> </ol>

of dredge pumps and barges required, the amount of water, if any, that will require treatment, and any ancillary construction that will be necessary. The estimated costs for remediation are project-specific.

Procedures for estimating the cost of industrial and municipal water pollution control technologies are well established. The U.S. Environmental Protection Agency's (EPA) effluent guidelines development documents, available from the EPA's Industrial Technology Division, provide a rich source of information on the cost of industrial wastewater treatment. A greater challenge will be quantifying costs associated with high-technology pollution prevention alternatives, such as redesigning a manufacturing process.

Cost information for urban and agricultural nonpoint source control is less straightforward due to the number of site-specific factors that need to be addressed. Comparative costs for urban nonpoint source controls, such as stormwater runoff controls, can be obtained from *A Current Assessment of Urban Best Management Practices: Techniques for Reducing Non-Point Source Pollution in the Coastal Zone* (MWWCOG 1992). An excellent source for both urban and agricultural nonpoint source controls is *Guidance for Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (EPA 1993a). Costs for urban and agricultural nonpoint source controls may include the size of the areas contributing to the contamination, local labor rates and construction rates, and expected size of control features.

Cost data will likely be generated in an iterative fashion throughout the development and implementation of the Regional Action Plan. For example, the Regional Action Plan may simply provide previously generated cost information for some alternatives and present no more than a "guesstimate" (e.g., less than \$100,000, approximately \$1 million) for other identified alternatives. If cost data are not available, however, the Regional Action Plan should identify sources, methods, and responsible parties for generating that cost data. Available cost data may be presented in tabular form, as shown in Exhibit 7-11, to facilitate the decision-making process for various alternatives.

#### **7.2.4 Financing**

A factor closely related to cost is financing. Environmental planners need to consider budgetary and fiscal constraints early in the Regional Action Plan process. The Regional Action Team should review the costing information and current funding directed by state, regional, and local programs and public utilities to assess the possibility of any financial constraints. The Regional Action Team should also consider the area's economic health and identify whether particular implementation actions will create unacceptable economic hardships. Exhibit 7-12 lists questions to consider.

**Exhibit 7-11. Example Cost Comparison for Potential Implementation Actions  
for Controlling Stormwater Runoff\***

Action	Estimated Costs			Source/Date of Estimate
	Capital	Annual O&M	Total Annual	
Construct infiltration basin	Average: \$0.5/ft <sup>3</sup> storage	Average: 7% of capital cost	\$0.03 - \$0.05/ft <sup>3</sup>	Wiegand et al. (1986); SWRPC (1991)
Construct infiltration trench	Average: \$4.0/ft <sup>3</sup>	Average: 9% of capital cost	\$0.3 - \$0.9/ft <sup>3</sup>	Wiegand et al. (1986); SWRPC (1991); Macal et al. (1987); Kuo et al. (1988)
Construct porous pavement	Average: \$1.5/ft <sup>2</sup>	Average: \$0.01/ft <sup>2</sup>	\$0.15/ft <sup>2</sup>	SWRPC (1991) Schueler (1987)
Construct sand filter/ filtration basin	Average: \$5/ft <sup>3</sup>	Average: Not Available Probable Cost: 7% of construction cost	\$0.1 - \$0.8/ft <sup>3</sup>	Tull (1990)
Construct oil/grit separator	Average: \$18,000/ drainage acre	Average: \$20/drainage acre	\$1,000/ drainage acre	Schueler (1987)
Construct extended detention dry pond	Average: \$0.5/ft <sup>3</sup> storage	Average: 4% of capital cost	\$0.007 - \$0.3/ft <sup>3</sup>	APWA Res. Foundation

\* This example is for illustrative purposes only and is not intended to be comprehensive.

Source: EPA (1993a).

## Exhibit 7-12. Questions Concerning Financing

- How much money will be required for the implementation action?
- Do the anticipated environmental benefits warrant the cost?
- Who will pay for the implementation action?
- Is funding available?
- Can innovative finance mechanisms be used?
- Is the implementation action required under an existing regulatory program?
- Is the implementation action already being initiated under an existing voluntary plan?

Funding shortfalls, both public and private, can be a serious roadblock to environmental projects. The success of the Regional Action Plan will depend on the ability of stakeholders to identify funding mechanisms. Appendix H briefly describes potential financing mechanisms. The appendix includes both traditional (e.g., general tax revenues, surcharges, revolving funds) and nontraditional (e.g., permit fees) mechanisms that may be used to raise funds for environmental projects. Many of these funding mechanisms are incentive-based, such as lower-than-market loans, NPDES permit fees based on mass pollutant or discharge toxicity, and user fees that more closely reflect the costs of providing services. Another good general reference for financing implementation actions is the 1995 report from the Governor's Blue Ribbon Panel entitled, *Financing Alternatives for Maryland's Tributary Strategies*. The report describes a wide array of financing ideas, including bonds, fees, loans, private initiatives/incentives, public/private partnerships, redirection of existing programs, and surcharges.

At this stage of the process, the Regional Action Team should identify which of the available projects, such as a stormwater utility, require finding an alternative funding source. The Regional Action Team may also want to initiate discussions with financial experts (both in

Prince Georges County, Maryland, funds a stormwater utility through an ad valorem tax and by requiring developers to set aside land (or equivalent value) for stormwater control projects. Other jurisdictions fund stormwater utilities by taxing properties based on "percent permeability," an indicator of runoff potential.

and out of government) to determine which alternative funding sources may be appropriate to raise the necessary funds. To the extent these discussions can be accomplished prior to production of the final Regional Action Plan, the contact points and funding sources discussed should be identified in the Regional Action Plan. In lieu of these discussions prior to production of the Regional Action Plan, the Regional Action Plan should identify the contacts to be made and the party(ies) responsible for making those contacts.

The Regional Action Team should also consider what other programs can be "leveraged" to fund Regional Action Plan implementation actions. For example, has a Superfund preliminary assessment/site investigation been conducted at abandoned waste sites? Is it possible to speed Resource Conservation and Recovery Act corrective actions at local industrial sites? Can the U.S. Corps of Engineers maintenance dredging be coordinated with remediation priorities? The Regional Action Plan should identify the ongoing environmental programs that can be viewed as "leveraging candidates" and the basis for attempting to leverage that program.

### **7.2.5 Regulatory and Nonregulatory Incentives**

The Regional Action Team will need to consider whether implementation actions can reasonably succeed, given the incentives and disincentives associated with the implementation action. As the cost of the action increases, the incentives must increase. Whether the program has a regulatory and/or nonregulatory component, incentives must exist. In the context of regulatory programs, the expectation of enforcement creates an incentive for compliance. Without the benefit of regulatory enforcement, nonregulatory programs depend on market incentives or public commitment to generate voluntary compliance. If a nonregulatory action is important to meeting the objectives of the Regional Action Plan, the Regional Action Team will want to evaluate whether sufficient incentives are in place to foster voluntary implementation. Exhibit 7-13 lists questions to consider when evaluating how responsive the target audience will be toward implementation of individual options.

In general, incentives are market-driven (assuming complete access to information). For example, farmers will reduce the use of expensive pesticides, if the reduction is shown to not affect overall profitability. Because of barriers in information flow and the existence of non-market goods, government action is often necessary to build or correct incentives. Consequently, outreach efforts are often

#### **Exhibit 7-13. Questions Concerning Implementation Incentives/Disincentives**

- Is the action covered under an existing regulatory program?
- Do any regulatory requirements act as barriers to implementation?
- Is the action covered under an existing voluntary program?
- Are there adequate mechanisms for disseminating information about the action?
- Are there mechanisms to provide technical assistance to implement the action?
- Do any financial incentives stimulate implementation of action?
- Do any financial impediments discourage implementation (including subsidies that encourage activities that conflict with this commitment)?
- What organization(s) will be responsible for monitoring progress in implementation?



employed to disseminate information on the use of proven pollution prevention technologies that reduce costs without sacrificing product quality. If success depends directly on voluntary action, the Regional Action Team needs to consider whether sufficient incentives exist to motivate action.

Protecting Chesapeake Bay resources enjoys widespread public support. Consequently, public recognition, through "green" certifications or award ceremonies, may act as another incentive to motivate actions. EPA is initiating a new program that creates incentives and rewards facilities for compliance. The Environmental Leadership Program, which is in its pilot phase, publicly recognizes private sector facilities that are identified as environmental leaders. The cornerstone of this program is industrial self-audits and self-disclosure. The program provides facilities a limited period in which to correct violations discovered in self-audits and disclosed to the regulatory agency. In addition, it guarantees that no routine inspections will be conducted at the facilities during their tenure in the program. EPA is developing a similar program for federal facilities.

Regulatory programs include an enforcement component, either through judicial or administrative actions, that provides a powerful motivating tool. Additional regulatory incentives include industrial self-monitoring, reporting, and public notice of violations. Increasingly, regulatory agencies are employing fees, penalties, and trading systems to create compliance incentives. Fees and taxes can be used to encourage facilities to reduce pollution in order to save money. Some jurisdictions are experimenting with point/nonpoint trading. For example, a POTW may meet nutrient control objectives by obtaining nutrient management agreements with farms. Farmers are obliged to undertake actions or sacrifice payments and possibly suffer breach of contract charges.

Innovative compliance agreements provide a control option worthy of consideration. EPA and several states have been developing Supplemental Enforcement Projects in which the agreed-upon penalty would be reduced to reflect the commitment made by the alleged violator to conduct a prescribed project, often a pollution prevention or remediation project, which might otherwise be viewed as beyond the reach of regulatory requirements (see *Policy on the Use of Supplemental Environmental Projects in EPA Settlements* [EPA 1991]). EPA Region 5, for example, was able to compel a facility to remediate contaminated sediment as a condition of a Clean Water Act enforcement settlement. Another viable Supplemental Enforcement Project alternative is requiring the violator to sponsor a series of training sessions for other members of the regulated community (e.g., have the facility sponsor a training session on pollution prevention options in a particular industry).

In addition to administrative or judicial enforcement, officials may take other actions to encourage compliance. Municipalities administering industrial pretreatment programs have successfully encouraged compliance by publishing the names of violators in local newspapers. Industry will consider the impact of public notice of noncompliance when formulating corporate compliance policies and in training personnel responsible for ensuring compliance with environmental regulatory requirements. Public notice of noncompliance can have a profound effect on a community's perspective of its corporate citizens. As citizens become more concerned about Bay quality issues, many companies have initiated marketing campaigns highlighting voluntary pollution prevention efforts, contributions to restoration of damaged local natural resources, and overall corporate concern with environmental issues.

### **7.2.6 Public Support**

Public support is an important component to the success of any environmental project. In general, the public has been supportive of environmental projects, recognizing the intrinsic value of a cleaner environment to their quality of life. Many environmental projects are prodded into being by enthusiastic public involvement. Other projects, such as household hazardous waste collection programs, hinge their success on widespread public involvement. Indeed, with the increased emphasis on voluntary programs, such as nonpoint source control, the need to generate and maintain public support is paramount.

Nonetheless, enthusiastic public support cannot be expected for all projects. The Not in My Backyard syndrome has been well documented. Similarly, the public values a good return on its invested tax dollars and is unlikely to support a project for which cost has not been given adequate scrutiny. Consequently, the Regional Action Team needs to ensure public support for the project. Moreover, it is best to generate public support throughout the process, rather than seeking "rubber stamp" public approval after the alternative project list has been narrowed. Chapter 3 provides more information on the need for public participation. Exhibit 7-14 lists several questions to consider when evaluating public support for individual implementation actions.

An issue related to public support, but encompassing all stakeholders, is impetus. Undertaking environmental projects can be a long-term process, where planning, design, implementation, and completion involve years of time and effort. Stakeholder interest, important to the overall success of the Regional Action Plan, can wane over time. Consequently, maintaining impetus is essential to Regional Action Plan success, and alternative projects should be assessed with regard to this important variable. While certain projects may "score" low with regard to certain variables (e.g., may not reduce contaminant

**Exhibit 7-14. Questions Concerning Public Support**

- Will the action impact employment rates?
- Will the action impact recreational opportunities?
- Will the action impact other quality of life indicators?
- Is there precedent for public support or disapproval of similar actions?
- Are there studies documenting public opinion (e.g., Chesapeake Bay Attitudes Survey [Chesapeake Bay Program, 1994])?

loadings to any significant degree), these projects may have value in that they can be accomplished quickly, demonstrating rapid results and anchoring continued stakeholder interest.

**7.2.7 Indicators for Measuring Progress**

The ability to demonstrate progress is an important factor in maintaining impetus for program implementation. Past experience has demonstrated that collecting sound evidence on the success of actions is also an important factor in fostering trust among government, industry, environmental groups, and citizens. Identifying indicators or measures of progress and effectiveness is another factor to consider when evaluating and selecting implementation actions.

Progress should be measured from both a programmatic standpoint (e.g., whether milestones are being achieved) and an environmental response perspective (e.g., whether chemical concentrations in fish tissue are declining). Monitoring programs can be expensive, so it is important that they are designed to collect only relevant information and that data gathering activities are accurate and reliable. If data collection efforts need to be increased beyond current ones, the costs of these efforts should be included in the estimate of the cost of the action. The following points should be considered when identifying measures of progress:

- Whenever possible, supplement programmatic indicators with environmental indicators
- Use existing data collection efforts, if appropriate
- Design data collection efforts so that they are consistent with other data collection programs in the Bay, whenever feasible
- Develop a sampling plan identifying minimum data collection requirement, sampling locations and frequency, sampling and analytical protocols, and quality assurance/quality control procedures
- Develop feedback programs to communicate information to both stakeholders and decision-makers.

### **7.3 ASSIGNING AND TRACKING COMMITMENTS**

Because the Regional Action Plan represents the beginning of the implementation process, it is important that it initiates the concept of responsibility. The Regional Action Plan can accomplish this by:

- Identifying actions that need to be taken
- Assigning parties responsible for taking the needed action
- Providing aggressive, realistic schedules for achieving the action
- Developing a "report back" scheme.

The first item, identifying actions that need to be taken, was discussed in the first two sections of this chapter. Therefore, the remainder of this section addresses the last three points.

Chapter 3 of this manual describes an approach for selecting appropriate Regional Action Team members. These individuals will probably represent core stakeholder groups, which are key to successfully implementing the Regional Action Plan. The Regional Action Plan should assign responsibilities, and associated accountability, to groups and individuals for implementing the various actions provided for in the Regional Action Plan. The Regional Action Plan can make tentative initial assignments with subsequent review and confirmation by the tentatively assigned party(ies).

Equally important is the provision of an aggressive, yet realistic, schedule. Two general types of deadlines are envisioned. One set of deadlines will be programmatic in nature, describing when, for example, permitting actions can be expected. The second set will be more global and goal-oriented, providing timelines for achieving the goals identified for the Region of Concern. Chapter 4 defines the goal-setting process.

Deadlines must be established to ensure progress. At the same time, deadlines must be realistic and sensitive to technical, institutional, and socio-political constraints. For example, deadlines should not be so aggressive that the opportunity for public input is minimized. In addition, unrealistic, unattainable deadlines may discourage participants and derail momentum.

Programmatic deadlines need to be considered seriously and, if the Regional Action Team is not sufficiently confident that concrete deadlines can be set without further information, "process-oriented" deadlines, such as a progress report and associated briefing of the Regional Action Team, can be included until more concrete deadlines can be established. In other cases, the timelines may be contingent on other

actions (e.g., "Six months from the receipt of the report on the feasibility of...."). The Regional Action Plan is expected to include an abbreviated list of actions, or steps, required by responsible parties, and more comprehensive timelines are expected to be developed as the Regional Action Plan unfolds.

The Regional Action Team needs to stay abreast of implementation action progress made by assigned agencies/individuals. It is recommended that the Regional Action Team receive periodic reports (e.g., monthly) summarizing progress to date. The lead agency should coordinate development and collection of these reports. As illustrated in Exhibit 7-15, the report should include activities during the current period; problems/issues that have arisen, including how they are being/will be addressed; planned activities for the following period; a schedule documenting major milestones (with planned and actual accomplishments); and a description of assistance, if any, that the project leader requires.

It is also recommended that the Regional Action Team organize periodic (e.g., semiannual) meetings of all project leaders to discuss current progress toward achieving objectives and goals. This meeting can also be used to raise the need for making mid-course corrections, as necessary, that more realistically address the project's current progress.

#### **7.4 PRESENTING IMPLEMENTATION ACTIONS IN THE REGIONAL ACTION PLAN**

The Regional Action Team should document the process used for identifying, evaluating, and selecting implementation actions in the Regional Plan. The Regional Action Plan should describe the approach for preparing the initial list of implementation actions by including responsible individuals/groups, materials reviewed, individuals/organizations contacted, and formal and informal peer review procedures and modifications to the list, if any, resulting from the review procedures.

The Regional Action Plan should summarize the methodology used to assess which actions are most appropriate and how such decisions were made. As noted in Section 7.2, the Regional Action Team should identify factors used in evaluating and then selecting the most appropriate actions. If factors were given different priority, the Regional Action Team needs to explain the rationale for weighting. If some factors were considered in evaluating one set of options, but not another, an explanation should be provided. The Regional Action Team will also need to describe any additional fact finding necessary as the Regional Action Plan process moves forward.

**Exhibit 7-15. Recommended Format of Periodic Progress Report, With Project Example**

**Title of Project:** Develop Total Maximum Daily Loads for Metals on Attaboy Creek (Goal I, Objective A, Action 6) **Project Leader:** Joan Sloan

**Current Activities**

- During week of August 8, prepared sampling plan, distributed for peer review, and finalized.
- Met with John Jones of Soil Conservation Service to discuss natural background of metals found in soils of the Upper Attaboy.
- Reviewed National Pollutant Discharge Elimination System permit files of major dischargers on the Attaboy Creek.
- Briefed Citizens Advisory Committee representative, Betty Davis, on opportunity for citizen monitoring.

**Problems/Issues Arising in Current Period**

- Scheduled sampling events on Longarm Run were delayed due to equipment malfunctions. Sampling has been re-scheduled to the first week of September.
- Funding limitations prohibited biomonitoring at Brown Bend on the Attaboy Creek.

**Planned Activities for Next Period**

- Conduct sampling on Longarm Run first week of September
- Conduct sampling on Brown Bend during third week of September.
- Meet with S. Stump and D. Farmer of F&AU to discuss current estimated sediment runoff rates associated with farming on Upper Attaboy and projected pesticide application rates using approaches recommended by agricultural extension agents.
- Meet with D.W. Waters to discuss current metal loadings to publicly owned treatment systems and influent sources based on industrial waste survey.
- Meet with Chesapeake Bay Modeling Subcommittee regarding procedures for estimating load allocation from nonpoint sources.

**Major Milestones**

<u>Deliverable Name</u>	<u>Planned Deadline</u>	<u>Actual Date</u>
• Collect background data from 304(l) reports	6/21/9-	6/20/9-
• Select appropriate total maximum daily load model	7/15/9-	7/15/9-
• Collect all necessary ambient data to calibrate model	10/9/9-	
• Complete model calibration	11/7/9-	

**Assistance Sought**

- Identify sources of backup monitoring equipment to use in case of malfunctions.

The Regional Action Team will need to develop a format for presenting the implementation actions in the Regional Action Plan. The Regional Action Plan should document the initial inventory of actions, the evaluation of actions, and identify which actions were selected. Exhibits 7-1, 7-2, and 7-3 illustrate several approaches for presenting the implementation actions in the Regional Action Plan. Another approach is to prepare a fact sheet or summary table for selected actions. As illustrated in Exhibit 7-16, this approach facilitates a description of how the action may address several problems and target several sources in the Region of Concern. This presentation format allows decision-makers to compare the benefits, costs, and implementation framework of each action.

Exhibit 7-16. Regional Action Plan Summary of Recommended Actions

Evaluation Factor	Action 1	Action 2
Summary of action	<ul style="list-style-type: none"> <li>Reduce lead discharged to publicly owned treatment works (POTW) by providing pollution prevention information to industrial and commercial users</li> </ul>	<ul style="list-style-type: none"> <li>Reduce metal loadings from urban runoff by ensuring effectiveness of existing stormwater management programs (under federal stormwater program) and instituting additional urban runoff programs where needed</li> </ul>
Problem(s) addressed	<ul style="list-style-type: none"> <li>Ambient concentrations exceed water quality standards (WQS)</li> <li>Shellfish contamination</li> <li>Sediment contamination</li> </ul>	<ul style="list-style-type: none"> <li>Ambient concentrations exceed water quality standards (WQS)</li> <li>Shellfish contamination</li> <li>Sediment contamination</li> </ul>
Magnitude of contribution to problem	<ul style="list-style-type: none"> <li>Unknown due to lack of POTW discharge monitoring requirement for lead and uncertainty about sediment-water column interactions</li> </ul>	<ul style="list-style-type: none"> <li>Uncertain due to lack of monitoring data on stormwater</li> </ul>
Sources targeted	<ul style="list-style-type: none"> <li>Commercial and industrial dischargers</li> </ul>	<ul style="list-style-type: none"> <li>Commercial and industrial properties</li> <li>Municipal properties</li> <li>Developing areas</li> </ul>
Entity responsible for implementation	<ul style="list-style-type: none"> <li>Municipal pretreatment program</li> </ul>	<ul style="list-style-type: none"> <li>Municipal government(s), flood control districts, departments of transportation</li> </ul>
Entities contributing to implementation	<ul style="list-style-type: none"> <li>State pollution prevention office</li> <li>Industrial and commercial facilities</li> </ul>	<ul style="list-style-type: none"> <li>State/federal stormwater coordinators</li> <li>Industrial and commercial facilities</li> <li>Households</li> </ul>
Cost	<ul style="list-style-type: none"> <li>\$30,000 to identify sources, conduct workshop, and perform 20 pollution prevention opportunity assessments.</li> </ul>	<ul style="list-style-type: none"> <li>\$75,000 - \$500,000, depending on size of municipality</li> </ul>
Financing/resources available	<ul style="list-style-type: none"> <li>State to train POTW staff on pollution prevention opportunity assessments and conduct workshop with POTW for dischargers; POTW to perform 20 assessments</li> </ul>	<ul style="list-style-type: none"> <li>104(b)(3) grants from states</li> <li>Potential for stormwater utility fees</li> </ul>
Incentives	<ul style="list-style-type: none"> <li>POTW initiating monitoring program to collect data for re-evaluating local limits, as required by NPDES permit.</li> </ul>	<ul style="list-style-type: none"> <li>Represents a proactive approach toward Plan II of the federal stormwater program</li> <li>Prevention approach, particularly in developing areas, is less costly than retrofitting</li> </ul>
Timeframe for implementation	<ul style="list-style-type: none"> <li>6 months for pollution prevention training</li> <li>12 - 18 months for local limit</li> </ul>	<ul style="list-style-type: none"> <li>2 - 5 years</li> </ul>
Measures of success	<ul style="list-style-type: none"> <li>Reduction of lead in discharge by both industrial users and POTW</li> <li>Reduction of shellfish concentration</li> <li>Meet WQS</li> </ul>	<ul style="list-style-type: none"> <li>Loadings reduction</li> <li>Reduction of shellfish concentration</li> <li>Meet WQS</li> </ul>
Ranking of priority for implementation	<ul style="list-style-type: none"> <li>High</li> </ul>	<ul style="list-style-type: none"> <li>High</li> </ul>



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