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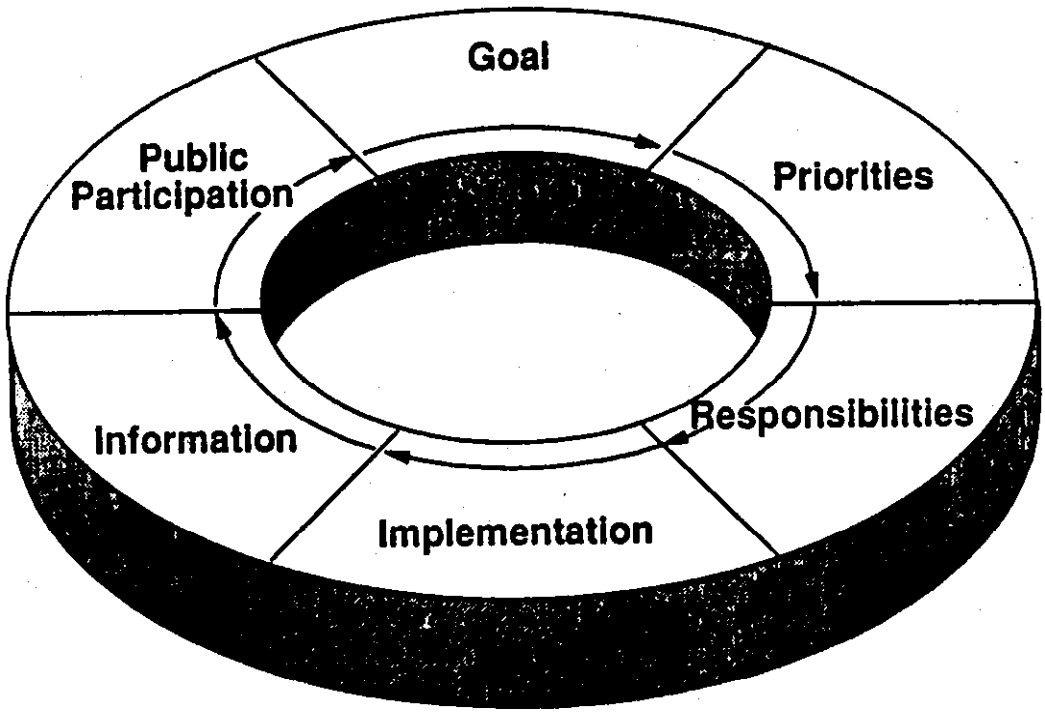

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1. INTRODUCTION

Comprehensive State Ground Water Protection Programs (CSGWPPs) are the focal point for a new partnership between EPA, the States, Native American Tribes,[1] and local governments to achieve a more efficient, coherent, and comprehensive approach to protecting the nation's ground water resources. CSGWPPs are also an important step in implementing EPA's ground water protection goal and principles.

EPA's overall goal is to prevent adverse effects to human health and the environment and to protect the environmental integrity of the nation's ground water. This goal calls for CSGWPPs that ensure protection of drinking water supplies and maintenance of the environmental integrity of ecosystems associated with ground water. In addition, EPA's goal statement notes that "in determining appropriate prevention and protection strategies, EPA will also consider the use, value, and vulnerability of the resource, as well as social and economic values." Given the lessons learned over the last several years regarding the extensive use and high value of ground water, its vulnerability to contamination, and the social and economic consequences of such contamination, EPA will pursue the following three-tiered hierarchy of preferred ground water protection objectives:[2]

- **Prevention of contamination whenever possible.** In order to meet the Agency's goal of preventing adverse effects to human health and the environment and protecting environmental integrity, prevention of contamination must be the first priority of the CSGWPP approach.

- **Prevention of contamination based on the relative vulnerability of the resource, and where necessary the ground water's use and value.** While prevention of contamination whenever possible must be the first priority of a CSGWPP, EPA also recognizes that basic human activity has impacts on ground water. Prevention of all discharges to all ground water is not possible. This should not be construed as allowing ground waters to be "written-off." Rather, EPA believes that some level of protection should be considered for all ground water resources.

  Other factors may need to be taken into account when making ground water protection decisions. The relative vulnerability[3] of the ground

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[1] Except where necessary to reflect differences between States and Native American Tribes, the balance of this Guidance uses "State" to refer to both States and Tribes.

[2] See Appendix A for a more detailed discussion of EPA's ground water goal and its relationship to State programs.

[3] EPA defines ground water vulnerability as the relative ease with which a contaminant introduced into the environment can migrate to an aquifer under a given set of management practices, contaminant characteristics, and aquifer sensitivity conditions. Ground water vulnerability assessment methods assess hydrogeologic characteristics, contaminant characteristics, and management practices related to contaminants.

water should help determine the level of source control measures necessary to prevent contamination. As an additional preventive measure, the relative use, value, and vulnerability of ground waters at different locations should be considered in decisions regarding the siting of facilities or activities. Also, due to limited government personnel and financial resources, the relative use, value, and vulnerability of ground waters should be key factors in setting priorities for day-to-day operations of relevant programs (e.g. which permits to write first, which inspections to do first, which clean-ups to begin first).

Finally, in some cases, EPA is required by statute to base regulation on consideration of the risks and the benefits of activities that may pose health or environmental concerns. Such consideration could result in targeting prevention measures to those areas where ground waters are considered to have certain uses and values that, if not protected and conserved, would pose an unreasonable risk to human health or the environment now or for future generations. While under these federal statutes EPA and the States will need to ensure protection of ground waters with certain uses and values, States are encouraged to pursue prevention whenever possible.

- **Remediation based on relative use and value of ground water.** Although the focus of ground water protection should be on the prevention of contamination, remediation must be pursued as a final option when prevention fails or where contamination already exists. EPA's goal is to remediate all aquifers to meet their designated uses. Given the expense of cleaning up ground water contamination and the need to focus more effort and resources on prevention, EPA and the States must take a realistic approach to restoration based upon the actual and reasonably expected uses of the resource as well as on social and economic values. EPA, the States, and other federal agencies must work together to ensure consistent approaches to determining clean-up objectives.

EPA is seeking to make the Comprehensive Program approach the catalyst for fundamental change in the development and implementation of ground water protection programs at the federal, State, and local levels. To achieve this end, CSGWPPs will further empower States with the primary role in coordinating all ground water-related programs and will expedite this coordination based on a State-directed, resource-based approach. The CSGWPP approach will effect the changes required for realization of the principles by meeting the following objectives:

- Provide States with greater flexibility in directing their ground water protection activities across the various EPA programs, sources of

contamination, and geographic areas to achieve comprehensive resource-based ground water protection;

- Eliminate the potential for ground water-related programs to be at cross-purposes, resulting in confusion and inefficient expenditure of efforts;
- Demonstrate the States' effectiveness in ground water protection to better justify additional funds for program development and implementation and additional flexibility from EPA and other federal agencies;
- Recognize and further delineate the appropriate roles for federal, State, and local governments as partners in ground water protection;
- Establish a forum for a better understanding and recognition of the interrelatedness of ground water quantity and quality concerns;
- Improve public understanding of ground water protection concerns in each State and provide a broader context for public participation; and
- Build a consensus across all levels of government on the need for comprehensive protection and on the basic structure of comprehensive programs.

Many of these objectives are already being met at the State level. However, additional effort is necessary at both the federal and State levels to ensure comprehensive ground water protection. To achieve the changes necessary to implement the CSGWPP approach, EPA and the States need to commit jointly to the CSGWPP approach as the focus of a long-term process for effecting both improvement in existing State programs and fundamental changes in the operation of federal programs related to ground water. This Guidance describes the cooperative process that States and EPA will use in developing and implementing the CSGWPP approach. It clarifies why this is the best approach to protection, given current or threatened contamination and the wide ranging responses to contamination over the past two decades, as well as the future legislative, regulatory, and other federal initiatives on the horizon.

1.1 GROUND WATER CONTAMINATION IS A NATIONAL CONCERN

Until the late 1970s, ground water was generally considered to be a pristine resource. Both experts and the public believed that the subsurface waters were naturally protected by layers of soil and earth and were self-cleansing. Contamination,

where it occurred, was thought to be primarily localized and the result of septic systems operations.

Threats to Ground Water

In the late 1970s and early 1980s, releases from waste sites such as Love Canal and the "Valley of the Drums," pesticide incidents such as releases of EDB and widespread discoveries of DBCP and Aldicarb in ground water and increased reports of drinking water well closures slowly focused the public's attention on ground water contamination. Through further research, news reports, and studies, we are now aware that there are many threats to ground water: man-made chemicals of many kinds and uses, including synthetic organic compounds; fertilizers; pesticides; wastes from mineral and petroleum exploration, production, transportation, storage, and use; and human and animal wastes, among others. Over 30 major categories of sources of ground water contamination have been identified. They include underground storage tanks, surface impoundments, municipal and other landfills, active and inactive hazardous waste management sites, pesticide storage, mixing, and application sites, septic tanks, underground injection wells and a variety of other sources.

Importance of Ground Water

At the same time as these threats to ground water began to be more clearly recognized, the importance of protecting ground water also became clearer, not only as a source of drinking water but also for its other beneficial uses and ecological roles. About 50 percent of the population of the United States receives its drinking water from ground water. While ground water supplies about 35 percent of the drinking water used in urban areas, it supplies close to 95 percent of the drinking water in rural areas. Several states depend on ground water for over 90 percent of their drinking water.

Ground water is also critical for other beneficial uses such as agriculture and industry. Ninety percent of the ground water withdrawals in Arkansas, Colorado, Kansas and Nebraska are for agricultural activities. In the eastern and mid-western industrial states, 30 percent of the ground water withdrawn is used in industrial processes.

Ground water also has important ecological functions. Ground water and surface water are interconnected. The U.S. Geological Survey estimates that 40 percent of the annual average streamflow in the United States is derived from ground water, or baseflow. (U.S. Geological Survey, 1988, National Water Summary - 1986, USGS Water Supply Paper 2325, p. 3) In some places, particularly humid zones, over 90 percent of the stream flow is from ground water. Recent research findings point to intrinsic ground water ecology, i.e., numerous species living in ground water, as being another reason to be concerned about the quality of ground water. Clearly, ground water is important in maintaining ecosystems and habitats.

1.2 WIDE-RANGING RESPONSES OVER THE LAST TWO DECADES

From the mid-1970's to the present, the federal government, State and local governments, and the private sector have responded to incidents of ground water contamination with a diverse array of actions and studies. Additional actions are likely in the near future.

Ground Water as a Focus of Environmental Action

Federal Laws, Regulations, and National Guidances. Many of the federal environmental statutes enacted in the past two decades had as their primary objective the protection or remediation of ground water. The Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which at their initial enactments already contained major ground water protection components, were both reauthorized in the mid 1980's with provisions that increased their emphasis on ground water protection. The 1984 Hazardous and Solid Waste Amendments Act (HSWA) to RCRA added tight restrictions on land disposal of hazardous waste, additional technical requirements for hazardous waste management facilities, new requirements for municipal landfills, new restrictions on surface impoundments, and a new program to address underground storage tanks. In addition, new corrective action requirements for cleanup of earlier contamination at existing hazardous waste management facilities were imposed by HSWA and may ultimately involve thousands of sites. The Superfund Amendments and Reauthorization Act in 1986 (SARA) placed new emphasis on remediation of abandoned hazardous waste sites and gave new specificity to the cleanup requirements.

The 1988 Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) amendments modified pesticide registration and re-registration processes, which enhance the Agency's ability to regulate leachable products. In 1986, the Safe Drinking Water Act (SDWA) was amended by a new provision requiring each State to develop and implement a Wellhead Protection Program to serve as a mechanism for States and local governments to protect the recharge areas of public drinking water wells. The 1986 Amendments to the SDWA also strengthened EPA's regulatory role in protecting ground water from underground injection control wells and in protecting current underground sources of drinking water from contaminants.

States' Efforts. State activities to protect ground water in the 1980's and early 1990's have been extensive. Studies by the National Conference of State Legislatures indicated that all fifty States enacted legislation with ground water management provisions during the calendar years 1985-1991. This legislation included statements of State-wide ground water policies, establishment of ground water classification systems, definition of ground water quality standards, establishment of ground water protection funds, and/or numerous efforts to control sources of contamination.

At the same time, EPA has provided nearly $80 million since 1985 under the Clean Water Act to all the States to develop State-wide Ground Water Strategies. With this funding, each of the 50 States developed a Strategy and implemented significant ground water management efforts pursuant to it. Since 1987, States have been working to control non-point sources of ground water and surface water contamination under Section 319 of the Clean Water Act. From FY 1990 to FY 1993, EPA will spend about $180 million under §319 grants, with at least $20 million devoted to ground water protection. In addition, the States developed and are implementing many regulatory and non-regulatory programs under State statutes to address sources of ground water contamination not addressed by the federal government, such as diffuse sources like septic tanks.

Private Sector Activities. The private sector has also been influenced by the trend toward greater attention to ground water. Industry has spent hundreds of millions of dollars to clean up ground water at Superfund sites and to protect ground water at RCRA hazardous waste sites. Environmental audits are now routinely undertaken by industry to identify and address ground water contamination problems before they become unmanageable. Such environmental audits are also becoming a common practice in commercial real estate transactions to ensure that land being sold is clear of any ground water contamination or other environmental problems.

Coordination Efforts. Beginning in the late 1980's, EPA and many other federal agencies embarked upon a number of actions to pull together the disparate strands of ground water protection and to undertake new initiatives. In 1991 EPA developed and released a Strategy for ground water that established EPA's policy of promoting a comprehensive federal/State partnership in ground water protection. EPA also published the Pesticides and Ground Water Strategy addressing a specific threat to ground water. EPA's RCRA, Superfund, and Radiation Programs are also working to develop new approaches to protect ground water that will encompass a more comprehensive partnership with the States. Other federal agencies have been working with EPA's programs as well as refocusing their programs or starting new initiatives to protect ground water.

Possible New Initiatives Focusing on Ground Water

A new set of responses to ground water issues, ranging from possible legislation to regulatory and policy initiatives, could occur in the next few months or years.

Legislation in the 103rd Congress. There will likely be efforts to reauthorize many of the laws that currently address ground water, including the Safe Drinking Water Act, which includes the Wellhead Protection Program and the Underground Injection Control Program; RCRA Subtitles C and D and the Underground Storage

Tank Program; Superfund, including the criteria for the National Priorities List; and FIFRA. Bills also may be submitted dealing with above-ground storage tanks, wastes from oil and gas exploration and production, and fertilizers.

National Regulations and Guidances over the next five years. EPA is likely to promulgate regulatory changes and issue new national guidelines affecting ground water under the current statutes, whether there are legislative changes or not. These new initiatives include: actions affecting RCRA requirements for corrective action, municipal landfills and State/Tribal implementation, definition of hazardous waste, and requirements for ground water monitoring; revisions to the Superfund National Priorities List; the FIFRA Restricted-Use Rule for Ground Water Protection; the SDWA Underground Injection Control rule on Class V wells; new rules on sewage sludge use and disposal; requirements for stormwater management; and rules on ground water disinfection. EPA is also reviewing policy options for addressing ground water ecological concerns. Table 1-1 on the following pages provides a list of some of EPA's upcoming actions relating to ground water.

Other Federal Agencies. Several federal agencies are implementing new initiatives relating to ground water protection. USDA is implementing a Water Quality Initiative; DOI is reorienting the Federal/State Cooperative Program to implement a national assessment of ground water quality, taking steps to begin implementing a new mapping program nationwide in cooperation with the State geologists, and engaging in joint activity with the Bureau of Reclamation on the High Plains Aquifer Study; action by the Department of Energy is underway to implement a massive effort to clean up radioactive nuclear sites; action by the Department of Defense has begun to implement a massive effort to convert facilities to civilian use by cleaning up the sites to be transferred; and the Department of Transportation is working to develop new means of ensuring safe interstate transport of hazardous materials. These are only some of the initiatives by other federal agencies that will have an impact on ground water. Detailed descriptions of these agency's ground water-related programs are provided in Part II, Section 2.

Table 1-1
Upcoming EPA Regulatory and Guidance Actions Relating to Ground Water

Office of Prevention, Pesticides, and Toxic Substances (OPPTS):

- Guidance to States on developing Pesticide State Management Plans;
- SMP Rule Workgroup;
- Restricted Use Classification for Groundwater Contaminating Pesticides;
- Aldicarb Special Review;
- Storage and Disposal of Pesticides Residues;
- OPTS Annual Operating Guidance;
- FIFRA Cooperative Agreement Guidance;
- PCB Disposal Amendments; and
- Pesticide Data Requirements.

Office of Air and Radiation (OAR):

- Ground Water Protection for Inactive Uranium Mill Tailings Sites;
- Land Disposal of Low-Level Radioactive Wastes; and
- Disposal of High-Level Transuranic Radioactive Wastes.

Office of Solid Waste and Emergency Response (OSWER):

- Corrective Action for Releases from Solid Waste Management Units;
- Ground Water Monitoring Rule;
- Ground Water Amendments;
- Mining Waste Program Rule;
- Municipal Solid Waste Landfills, State/Tribal Implementation Rule;
- Liners and Leak Detection for Hazardous Waste Land Disposal Units;
- Standards for the Location of Hazardous Waste Treatment, Storage, and Disposal Facilities;
- Ground-Water Monitoring Analytes;
- Disposal of Containerized Liquids in Hazardous Waste Landfills;
- Modification of Mixture/Derived From Rule;
- Toxicity Characteristics Rule Suspension for Oil Spill Cleanups;
- Use of Ground Water Data in Hazardous Waste Delisting Decisions;
- Corrective Action Stabilization Strategy and Guidance;
- Hazardous Waste Land Disposal Restrictions "Third-Thirds" Rule Implementation Guidance;
- Land Disposal Restrictions: Treatment Standards for Newly Identified and Listed Wastes & Contaminated Soils;

Table 1-1 (continued)
Upcoming EPA Regulatory and Guidance Actions Relating to Ground Water

Office of Solid Waste and Emergency Response (OSWER) (continued):

- Revisions to the National Oil and Hazardous Pollution Contingency Plan;
- OERR Strategic Plan for Addressing Ground Water Contamination at Superfund Sites;
- Guidance on Remedial Action for Contaminated Ground Water at Superfund Sites;
- Superfund/RCRA Technical Impracticability Waiver/Guidance;
- Multi-Source Groundwater Guidance;
- Preliminary Assessment Guidance for HRS;
- Data Useability for Site Assessment for HRS;
- Site Investigation Guidance for HRS; and
- HRS Guidance Document for Commonly Encountered HRS Scoring Questions.

Office of Water (OW):

- National Primary Drinking Water Regulations: Contaminants from First Drinking Water Priority List (Phase VI);
- Ground Water Disinfection Rule;
- UIC Class V Well Regulation;
- Technical Standards for the Use and Disposal of Sewage Sludge;
- Guidance for 106 funds;
- Guidance for 319 funds;
- Guidance for 319 State Management Plans; and
- Naturally Occurring Radioactive Nuclides.

Office of Enforcement (OE):

- Guidance for State-EPA Enforcement Agreements.

1.3 WHAT EPA AND THE STATES HAVE LEARNED

The activities focused on protecting and cleaning up ground water for the past twenty years have been marked by both successes and failures and have led States and EPA to conclude that:

- **A greater emphasis on prevention of ground water contamination is needed.** Preventing a problem before it starts or gets worse is generally sound public policy. Prevention of ground water contamination is usually much less costly than cleaning up after contamination has occurred.

  One way to demonstrate the high costs of contamination is to consider the cost of well replacement. For example, at Prices Landfill in New Jersey, a Superfund site, a municipal well field of ten wells was abandoned due to contamination and a new wellfield was established at a cost of about $5 million, or about $500,000 per well. In most cases, the costs of cleaning up ground water contamination are also extremely high. A 1988 study of 153 Superfund sites showed that projected ground water remediation costs, at about a quarter of these sites, were over $10 million per site, with the most expensive site being $120 million.

  Prevention, in contrast, usually costs significantly less. Communities with small water supply systems serving hundreds to thousands of consumers have implemented Wellhead Protection Programs at a cost of about 5 to 10 percent of the capital costs of well installation. Economies of scale in larger wellfields, such as South Florida, have led to a cost of protection as low as 1 percent of the capital costs required for facilities to treat drinking water supplies that have been contaminated.

  In 1991, the U.S. General Accounting Office, looking at these cost differences, concluded that a "shift of emphasis between prevention and remedial programs is warranted to help states implement preventive groundwater protection programs more effectively." GAO recommended that EPA work with the States to develop ways to reorient some of their existing ground water programs to provide greater emphasis on preventive activities. ("More Emphasis Needed on Prevention in EPA's Efforts to Protect Groundwater," U.S. General Accounting Office, December 1991, GAO/RCED-92-47)

  Even if the costs of prevention and cleanup were roughly equivalent, prevention provides the only feasible means of addressing certain problems. We are increasingly finding that current ground water cleanup technologies cannot always succeed in removing certain categories of contaminants to the degree desired, especially non-aqueous phase liquids (NAPLs and DNAPLs) from aquifers.

- **Remediation should be based on differential protection.** While prevention of contamination will be promoted to the extent possible, decision-making concerning the appropriate level of remediation will need to be based, in part, on the relative use and value of the contaminated ground water. Cleanup of contaminated ground water is both time and resource intensive. Because of the need to attend to other environmental and societal issues in a time of limited resources, choices will have to be made about where to focus remedial actions and the extent of the remediation to be sought.

- **A local understanding of the resource is needed to establish priorities.** The number and variety of potential threats to ground water and the unique hydrological features of the resource vary extensively from one location to another. The total impact on the resource of all sources of contamination in a particular area, taking into consideration the unique features of the ground water, must be considered in establishing priorities and appropriate strategies for prevention and/or remediation.

  Thus, we must use the knowledge base held by State and local governments and private and non-profit organizations. Indeed, the technical experience of State and local personnel is a very important component of ground water protection. Because Statewide programs, including all component local efforts, must address ground water protection efforts in the field on a day-to-day basis, State and local personnel have gained useful insights into problems and remedies.

- **Flexibility in setting and addressing priorities at the State and local level is needed**. EPA, through extensive discussions with the States, has come to know more about inconsistencies and rigidities among federal ground water-related programs, which result in inefficient expenditures of efforts and less cost effective protection from a total resource-based perspective. EPA also has come to realize that the federal rigidity may be largely a result of ignorance or misconceptions regarding State ground water protection capabilities as well as State needs, priorities, and approaches.

- **Additional coordination of ground water-related programs and authorities is needed.** The current patchwork of ground water-related programs and efforts (See Figure 1-1) is not fully effective in protecting the resource. Federal source control programs, which provide the authority for many State efforts, focus on contamination that, in

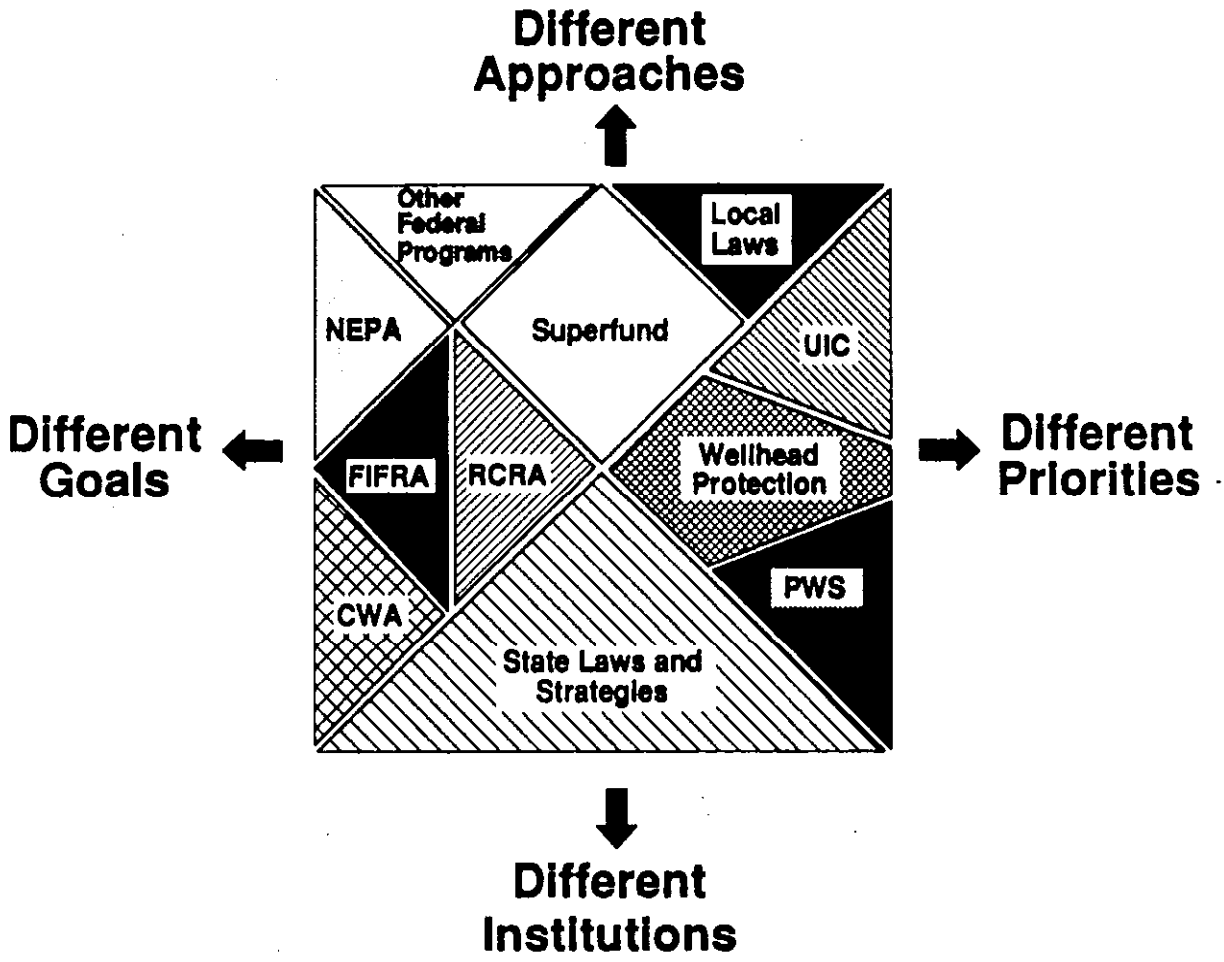

Figure 1-1. Coordination of the patchwork of programs and efforts is difficult.

aggregate, presents significant risks on a national basis, but may not represent the most important threats at specific locations to either drinking water supplies or ground water discharge to aquatic ecosystems.

Many small, dispersed, or nonpoint sources of contamination remain unaddressed. Commercial, residential, and industrial development frequently occurs with little or no recognition of the long-term impacts on the quality of ground water. The programs that address particular threats are not always consistent in their approaches or requirements. In some cases, duplication of effort may occur, while in others gaps in coverage for a resource-based perspective may exist. The programs address different goals with differing priorities, and the institutions and levels of government that implement them can differ from program to program.

- **A resource-based perspective needs a better understanding and recognition of the interrelatedness of ground water quantity and quality.** EPA is exploring the linkage between ground water quantity and quality through a study of the western States. At the urging of many groups involved in protecting ground water, EPA wants to work with States to further explore the interrelatedness of ground water quantity and quality. In the future, States may need to address methods that they will use to minimize the impacts of ground water withdrawals on ground water quality, to ensure that both aspects of ground water are considered. EPA continues to maintain that States have the primary role in ground water quantity policy.

- **Broad public education and participation is necessary.** Because the ground water resource is faced with such a broad array of potential threats, the best means for protection often will be derived from public education and support. The effectiveness of such an approach has already been demonstrated by Wellhead Protection activities, in which local programs successfully achieve protection of the ground water resource through public outreach and education.

- **More flexible funding at all levels of government is needed.** While a clear need may exist for all levels of government to increase the total amount of staff and grant resources devoted to ground water, much could be accomplished by removing some of the constraints to resource allocation for ground water at all levels of government. Existing resources need to be more flexible to address varying State priorities. Some of this flexibility can be provided by reducing the potential for programs to be at cross-purposes and avoiding inefficient expenditure across related programs. There also is a need to bring the federal

agencies to a better understanding of each other's programs and State programs and to provide additional federal flexibility to each of the States based upon their identified priority needs. Finally, there is a need to increase both the availability, quantity and quality of technical assistance to the States to set priorities and to implement programs to address those priorities.

- **A consensus on the nature of a comprehensive state ground water protection program is needed.** Missed opportunities have arisen from the lack of agreement about what constitutes a comprehensive State ground water protection program and the absence of a current vehicle for communicating the details of State capabilities and needs to other federal programs. Given the strong and highly-varied presence of the federal government in ground water protection issues (i.e., EPA regulatory programs, other agencies' regulatory programs, federal facilities, and federal assistance to States and local governments), such a situation is problematic even for those States that believe they have, or could accomplish, a comprehensive program alone.

1.4 CSGWPPS AS THE FOCUS OF A NEW FEDERAL/STATE/LOCAL PARTNERSHIP IN GROUND WATER PROTECTION.

CSGWPPs are intended to build on what we have learned about ground water protection and remediation efforts over the past two decades and to provide a national consensus on what actually comprises comprehensive ground water protection. Consequently, this Guidance and the CSGWPP approach incorporate many of the lessons learned directly into CSGWPP activities. When existing federal and State laws limit the successful incorporation of these lessons, the CSGWPP approach will help serve as the catalyst for the necessary changes in existing and emerging laws, regulations, and policies necessary to address the remaining lessons.

Therefore, CSGWPPs will have the following aspects:

- **Prevention.** A State's goal must, at least, be based on preventing ground water contamination whenever possible. EPA encourages each State to determine what is "possible" explicitly and through adequate public participation.

  EPA recognizes that preventing all discharges to all ground waters in the State is unrealistic. Therefore, States are encouraged to consider the relative vulnerability of ground water in determining necessary prevention measures and to consider the relative use and value, as well as, vulnerability, of ground waters when deciding where to site potential contamination sources or activities. EPA recognizes that the economic

and social impacts of prevention measures may need to be weighed against the use and value of specific ground water resources. As described in Appendix A, EPA believes that such balancing should be done primarily at the State level, often through representative government processes, except when federal statutes (e.g., FIFRA) or certain conditions call for a stronger federal role. However, EPA believes that prevention and reduction of contamination must be the first priority of each State's CSGWPP and that some level of protection should be considered for all ground waters in a State.

Where appropriate, the State should allow local governments to make decisions concerning what is "possible" in regard to preventing ground water contamination. Federal law will still need to be followed when prescribing what is possible. A State's goal must be at least as stringent as EPA's goal for prevention. A State's goal may be more stringent than EPA's, and may include a goal based on non-degradation or anti-degradation. This does not mean that EPA expects a State to prevent all discharges to ground water. EPA recognizes that the need will occasionally arise for realistic balancing of the economic and social costs of prevention against the underlying ground water's use and value. Such decisions, however, need to be based on an understanding of the current and reasonably expected uses of the ground water and a desire to conserve resources for future generations.

- **Remediation.** A State's goal must, at a minimum, be based on both current and reasonably expected uses of ground water, as well as ground waters that are closely hydrologically connected to surface waters (See Appendix B). For drinking waters, the attainment of Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act (SDWA) should be the remediation goal. For ground waters closely hydrologically connected to surface waters, the goal should be to reduce contamination so that its discharge to surface water does not exceed water quality standards established under the Clean Water Act. A State's goal for cleanup of contaminated ground water could also be based on "relative risk to human health and/or the environment" or on "remediation to the extent practicable." However, the cleanup levels resulting from these alternative approaches should be at least as stringent, and could be more stringent, as levels resulting from the methods described above.

- **State-directed, resource-based priority setting.** Under a CSGWPP, States are encouraged to set priorities for overall ground water management efforts based on a local understanding of the relative use, value, and vulnerability of the underlying ground water and potential contamination threats. Because resources are limited, States cannot

focus their ground water efforts (prevention, siting, and remediation) everywhere. Therefore, priorities need to be set across these activities.

- **State flexibility.** Flexibility will be provided to a State based on the State's meeting adequacy criteria. EPA is using the CSGWPP approach to catalyze further State flexibility while increasing the consistency among individual programs of the adequacy criteria that States must meet. At a minimum, the approach is intended to reduce the burden on the States in meeting numerous program criteria from several different programs. EPA's intention is that this integrated approach will provide a broader decision-making framework for States across programs, sources of contamination, and geographic areas. EPA also will use the CSGWPP approach as a basis for suggesting appropriate changes to existing federal statutes and regulations to allow States greater flexibility to achieve comprehensive resource-based ground water protection.

- **Program coordination**. The CSGWPP approach will help to ensure that programs work toward the same goal in a coordinated manner. Currently, the actions of the numerous programs that affect ground water, either directly or indirectly, can be at cross-purposes, resulting in confusion and inefficient expenditure of efforts. By integrating all programs and activities through a State-directed, resource-based approach, a CSGWPP will significantly reduce or eliminate such situations (See Figure 1-2). States will have a key role side-by-side with EPA in designing and implementing programs to protect the resource. States also will have greater flexibility in implementing each Agency program related to ground water protection based on the States' understanding of the relative use, value, and vulnerability of their ground water resources.

- **Increased Recognition of the Interrelationship between Ground Water Quantity and Quality.** Under their CSGWPPs, States are encouraged to coordinate their ground water quality and quantity objectives, particularly with regard to maintaining aquatic habitats.

- **Increased Public Participation and Support.** Another objective of the CSGWPP is to improve public understanding of the ground water protection concerns in each State and to provide a broader context for public participation. This will enhance understanding of choices for addressing those concerns and the social and economic as well as the environmental implications and trade-offs of those choices. The CSGWPP emphasis on public participation will help gain public support for State ground water protection decision-making.

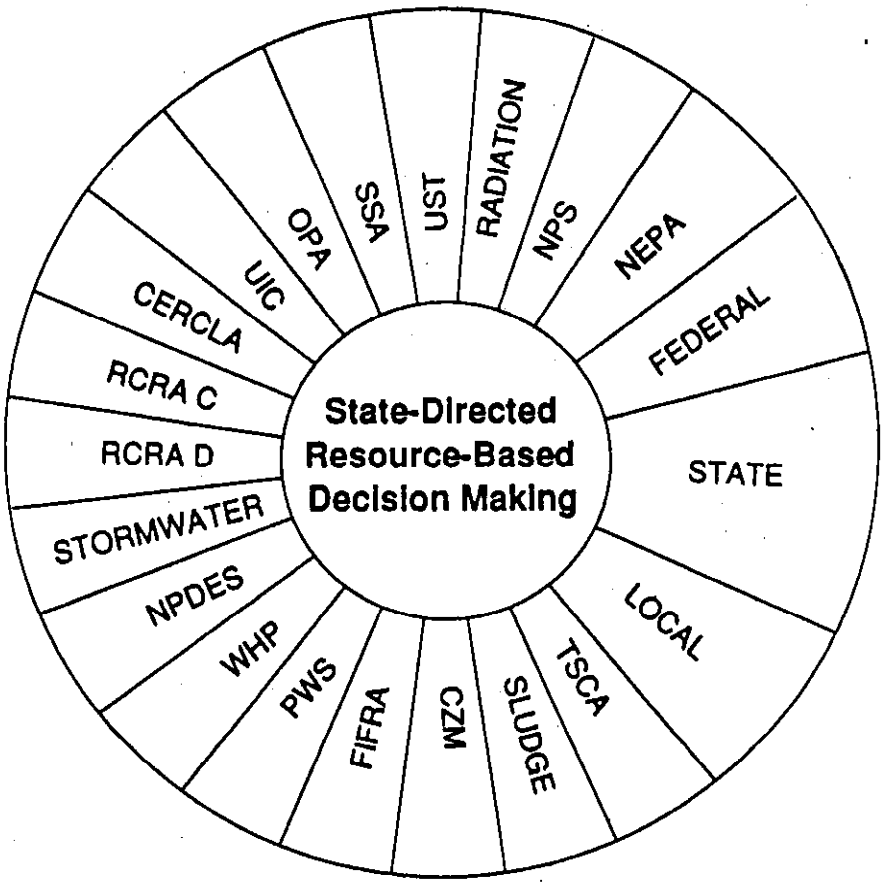

Figure 1-2. By centering all programs on a core of resource-based State goals and priorities, and integrating all programs, coordination will be significantly enhanced and the resource better protected.

- **More flexible funding**. Through increased program coordination, States with Comprehensive Programs will be able to better coordinate the expenditure of their limited resources under each relevant program. More importantly, because the CSGWPP approach recognizes the need to set priorities to manage ground water resources, it allows for a greater focus of financial resources and personnel for a variety of functions (i.e., site clean-ups, permitting, inspection activities) on the most critical human health and environmental risks within the statutory constraints presented by ground water protection laws such as RCRA, FIFRA, and CERCLA.

- **Consensus and future direction.** This Guidance provides the vehicle for establishing the needed consensus on the nature of a CSGWPP. In turn, this CSGWPP approach will help EPA, the States, and other federal agencies to further recognize, delineate, and coordinate their appropriate roles across ground water-related activities. Chapter 4 and Part II of this document describe how the CSGWPP approach can benefit specific ground water-related programs. For example, States, working with EPA through the CSGWPP approach, will identify where their capacity for ground water protection allows for increased flexibility under specific programs (e.g., RCRA, FIFRA) to better tailor protection efforts. These benefits will be realized as a result of CSGWPP development and implementation, which include a long-term strategy by EPA to adopt the CSGWPP approach in new and existing regulations, as well as program operational changes laid out in State negotiations with EPA Regional Offices. This Guidance, therefore, cannot be a comprehensive catalog of the benefits that eventually will be realized through the CSGWPP.

1.5 WHAT WILL CONSTITUTE A COMPREHENSIVE STATE GROUND WATER PROTECTION PROGRAM?

A Comprehensive State Ground Water Protection Program consists of a set of six Strategic Activities (Figure 1-3), which foster more efficient and effective protection of ground water through more cooperative, consistent, and coordinated operation of all relevant federal, State, and local programs within a State. The six Strategic Activities are:

- Establishing a ground water protection goal to guide all relevant federal, State, and local programs operating within the State;

- Establishing priorities, based on characterization of the resource, identification of sources of contamination, and programmatic needs, to guide all relevant federal, State, and local programs and activities in the State toward the most efficient and effective means of achieving the State's common ground water protection goal;

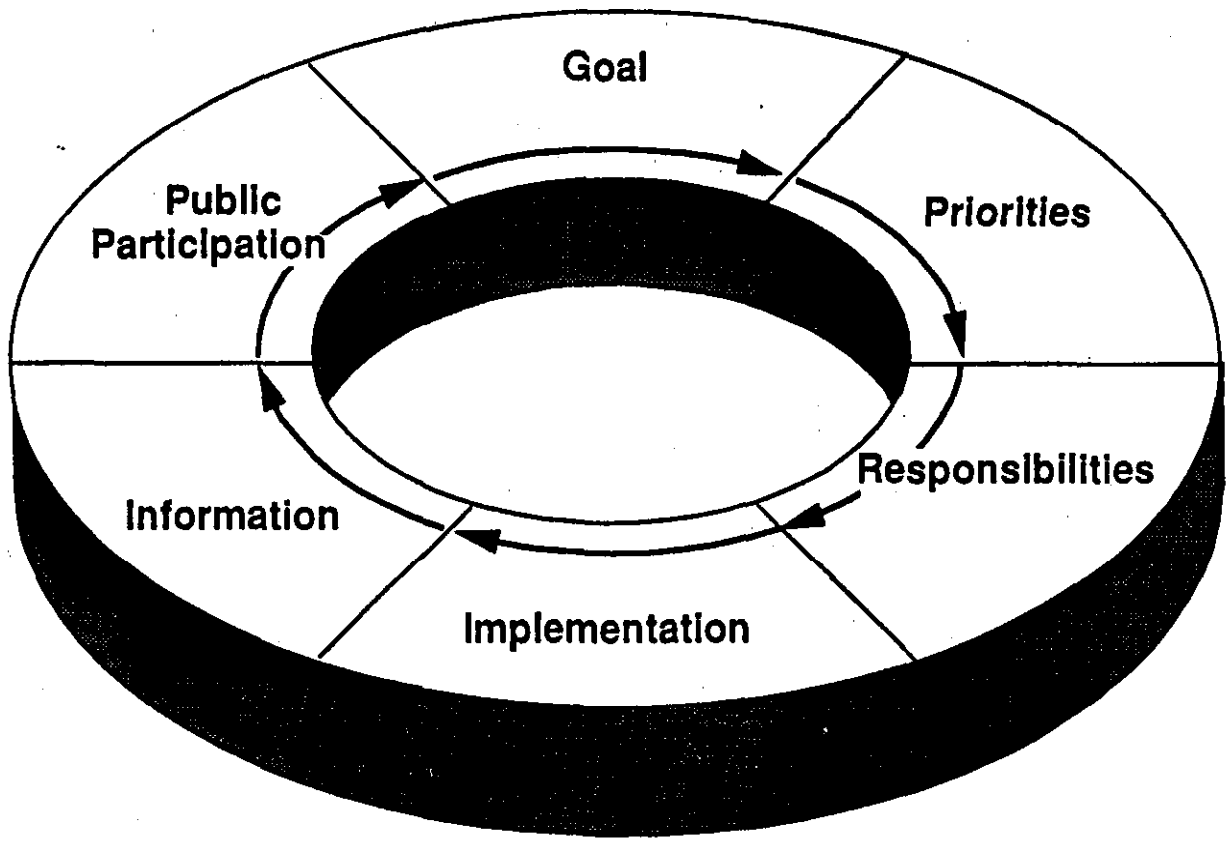

Figure 1-3. The six Strategic Activities of a CSGWPP are dynamic and inter-related; improvements in one activity lead to improvements in the other five.

- Defining authorities, roles, responsibilities, resources, and coordinating mechanisms across relevant federal, State, tribal, and local programs for addressing identified ground water protection priorities;

- Implementing all necessary efforts to accomplish the State's ground water protection goal consistent with the State's priorities and schedules;

- Coordinating information collection and management to measure progress, re-evaluate priorities, and support all ground water-related programs; and

- Improving public education and participation in all aspects of ground water protection to achieve support of the State's protection goal, priorities, and programs.

While planning is necessary in developing and implementing these Strategic Activities, a plan does not by itself constitute a CSGWPP. The Comprehensive Program focuses on the coordinated and consistent implementation of the six Strategic Activities across all ground water-related programs. The Strategic Activities of a CSGWPP are meant to influence all ground water-related programs within the State, including those of EPA and, where appropriate, other federal programs in a way that results in fundamental changes in their overall approach to ground water protection. Such influence should result in greater integration and efficiency of all program efforts through its attention to State-directed, resource-based protection priorities.

1.6 THE CSGWPP DEVELOPMENT PROCESS: THE NEW PARTNERSHIP IN ACTION

While many States have made enormous strides in ground water protection, EPA recognizes that significant gaps in ground water protection remain in most States in achieving a Fully-Integrating CSGWPP. More importantly, the Agency understands that movement towards a State-directed, resource-based comprehensive approach to ground water protection will also require fundamental changes in a number of federal programs, particularly in terms of regulatory policy and federal financial support to the States. EPA expects the development of CSGWPPs that achieve all the benefits of the approach to take place over the next several years. States will have the lead in developing and implementing their CSGWPPs. However, EPA and the States need to commit jointly to the CSGWPP approach as the focus of a long-term process for effecting both improvements in existing State programs and fundamental changes in the operation of federal programs.

From "Core" CSGWPP to "Fully-Integrating" CSGWPP

A key aspect of the process envisioned by EPA for achieving a State-directed, resource-based approach to ground water protection relies on a State's continuous improvement from a "Core" CSGWPP to an eventual "Fully-Integrating" CSGWPP as is illustrated in Figure 1-4. To parallel the States' efforts to improve their six Strategic Activities of a CSGWPP, EPA will undertake self-assessments of its own programs and will work with other federal agencies and the Congress to tailor new programs or modify existing programs so they are flexible and capable of adopting the ground water protection goal and priorities of each State's CSGWPP. Improvements in a State's CSGWPP Strategic Activities will both catalyze and be energized by changes in federal programs to achieve a State-directed, resource-based comprehensive approach to ground water protection, i.e., a Fully-Integrating CSGWPP (Figure 1-5).

The eventual goal -- attainment of a Fully-Integrating CSGWPP -- means that ground water protection efforts are coordinated and focused across all federal, State, and local programs based on a State's understanding and decisions regarding the relative use, value, and vulnerability of its ground water resources, including the relative threat of all actual or potential contamination sources. A Fully-Integrating CSGWPP addresses all of the adequacy criteria for each of the six Strategic Activities of a CSGWPP described in Chapter 2 of this Guidance. The adequacy criteria for a Fully-Integrating CSGWPP provide considerable flexibility in what each State's Fully-Integrating CSGWPP will actually encompass. Thus, a State can tailor its Fully-Integrating CSGWPP to emphasize those decision-making responsibilities it believes are most suitable to its own purposes. EPA is committed to working with each State in a joint effort to gain additional decision-making responsibilities under various federal programs and achieve a Fully-Integrating CSGWPP.

A "Core" CSGWPP represents a State's initial commitment to working jointly with EPA to move toward a Fully-Integrating CSGWPP. A Core CSGWPP provides the means for States to demonstrate, and for EPA to endorse, the State's potential to be the primary decision-maker in ground water protection efforts. A State will attain a Core CSGWPP when it has met the Core adequacy criteria for each of the six Strategic Activities, which are also described in Chapter 2. EPA will assist a State in attaining the Core CSGWPP by contributing to the development and review of program submissions and either endorsing[4] the State's Comprehensive Program as having achieved the Core level or recommending changes and improvements.

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[4] EPA's Ground Water Protection Strategy stated that EPA would "concur" on a State's determination that it had obtained a CSGWPP. Comments from State officials suggest that this term does not characterize the State/EPA partnership necessary to the CSGWPP approach correctly, but instead implies program delegation as usual. Because this program is meant to be fundamentally cooperative and consensual, the term "endorse" has now been adopted to better indicate the intended relationship. Endorsement is a means for EPA to bring recognition to a State's success in initiating a more comprehensive approach to protecting its ground water resources.

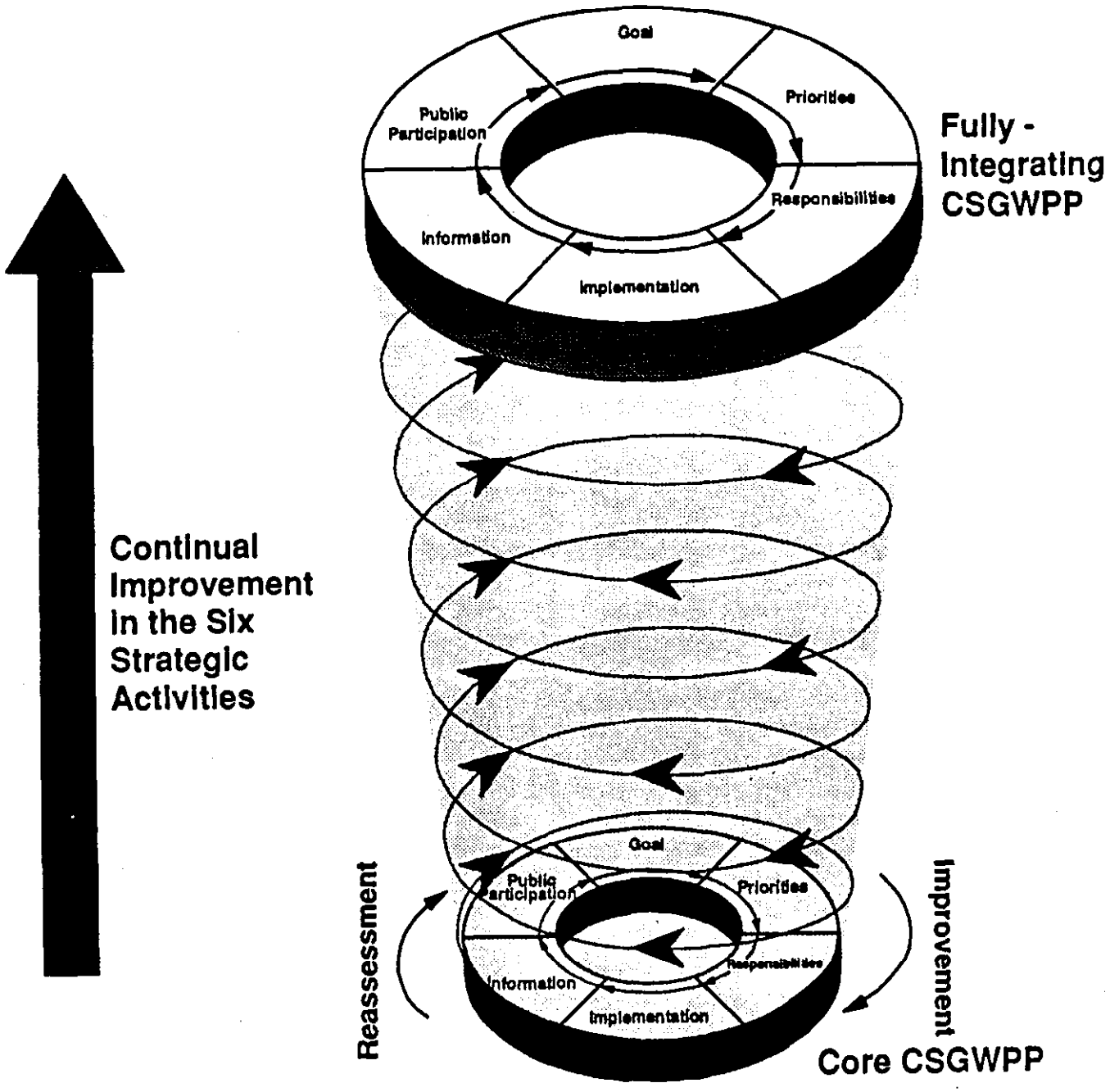

Figure 1-4. Continuous improvements in each of the six interrelated Strategic Activities move a State from a "Core" program to a "Fully-Integrating" CSGWPP.

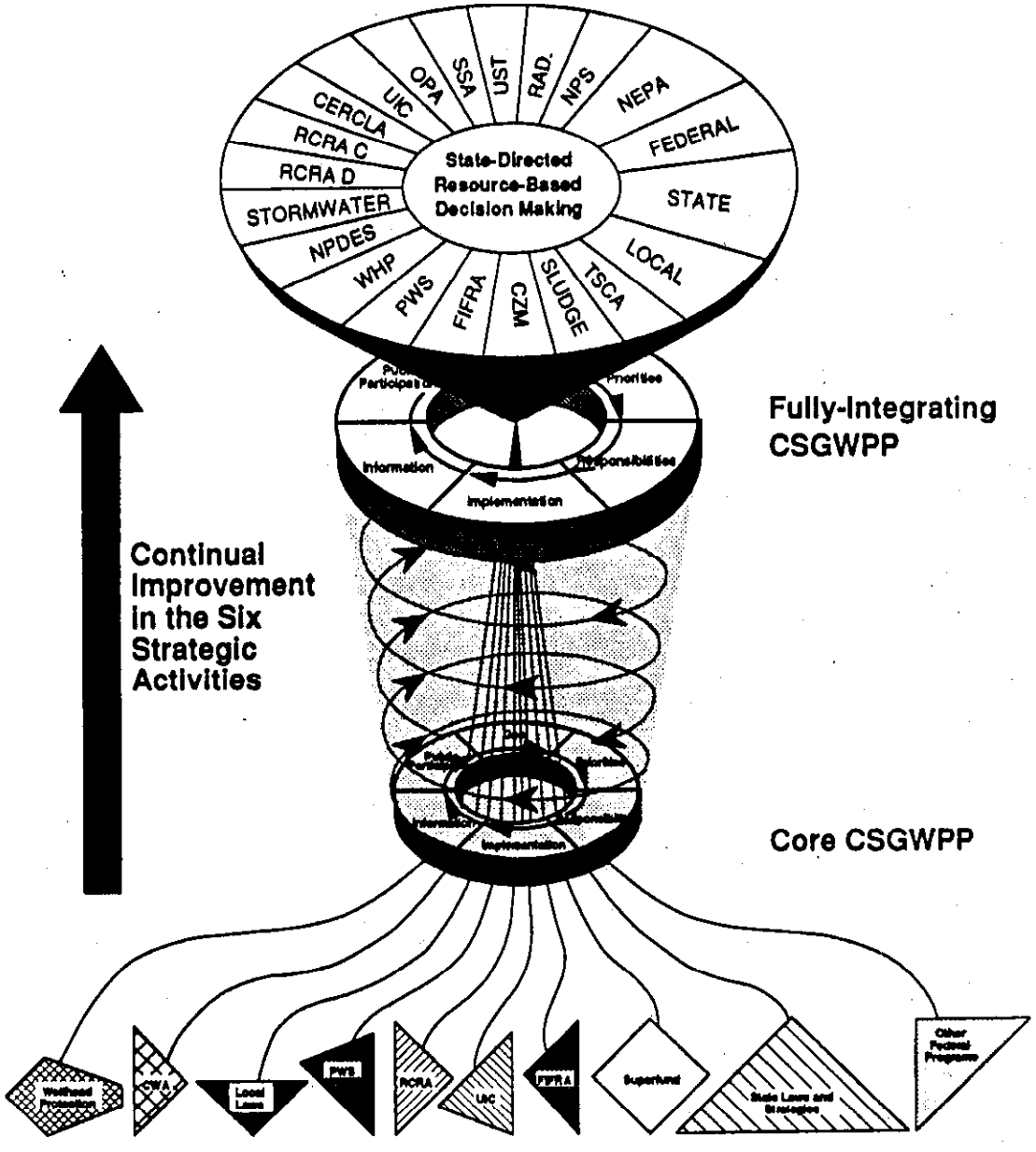

Figure 1-5. Improvement in a State's CSGWPP will both catalyze and be energized by changes in federal programs leading to more coherent ground water protection.

Steps for States to Take

The development process for both a Core and Fully-Integrating CSGWPP involves, as noted above, meeting adequacy criteria under the six Strategic Activities. The development process should build on the often extensive ground water protection efforts already being conducted within a State. States will have the lead in developing and implementing their Core and Fully-Integrating CSGWPP. The starting point is a State's ground water protection strategy[5] and its recent profile of current ground water programs and activities. The development process entails the following four general steps, which a State may undertake in combination or separately:

- Based on a State's ground water strategy and profile, this Guidance, and negotiations with the appropriate EPA Regional Offices, each State should establish a more specific vision for what its Fully-Integrating CSGWPP will ultimately comprise in order to reflect not only its unique environmental and institutional circumstances, but also what roles and responsibilities the State wants, and believes itself capable of undertaking, in ground water protection decision-making. Because this vision sets the State's long-term direction for its CSGWPP, all relevant programs within the State, as well as the public, need to be involved in its formulation.

- Each State should compare its more specific CSGWPP vision to the information it collected during profiling to develop a written assessment of the activities the State must undertake to achieve, first, a Core CSGWPP and, eventually, a Fully-Integrating CSGWPP. A State in working with the Regions may document that it has already achieved a Core CSGWPP. For many States, the written assessment will be the documentation describing their Core CSGWPP and no other document will be needed. States should have a continuous dialogue with EPA Regional Offices, so that the EPA can assist States when possible and provide direction for each of the ground water-related programs.

- States will attain EPA's formal endorsement of their Core CSGWPPs. Formal EPA endorsement of a State's achievement of a Core CSGWPP will provide the Agency, the States, other federal agencies, the Congress and State legislatures with a foundation for understanding State capabilities and, thereby, gain further support for the movement toward a Fully-Integrating CSGWPP. Demonstration of a State's tangible commitment to comprehensive ground water protection through its endorsed Core program will be key to bringing relevant federal programs and agencies to the table to negotiate a Multi-Year Program

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[5] All States have completed a draft ground water protection strategy. However, a number of these strategies are several years old, not finalized, or no longer operational.

Agreement. Each State is expected to obtain a Core CSGWPP as early as possible, but no later than the end of 1995.

- Following EPA endorsement of its Core CSGWPP, each State should co-develop with EPA a written Multi-Year Program Agreement. This Agreement should describe how the State will further implement and over time improve the Strategic Activities of its Core CSGWPP and identify the specific actions EPA will take to support the State's efforts across all relevant programs, including milestones for increased program flexibility.

- The annual State/EPA agreements or all program workplans relevant to ground water protection currently used by EPA and the States will be the focus for implementing the multi-year CSGWPP program agreements. Each completed yearly workplan will outline specific activities to be accomplished in that year to move the State towards implementing comprehensive protection of the ground water resource.

The emphasis of the CSGWPP development process is on inclusion and coordinated action. While including all affected parties in the process may take longer, EPA believes that it is necessary for coordinated action based on State-directed, resource-based priorities. States will develop CSGWPPs with participation from appropriate State and federal agencies and Tribal and local governments to the extent possible. Indian Tribes or consortia that choose to develop CSGWPPs will include all relevant State agencies, federal programs, and local governments.

EPA understands that the status of each State or Tribal ground water protection effort is different and that each State or Tribe will have an individual starting point for developing its CSGWPP. In addition, EPA recognizes and is encouraged that some States, given their history of effort in ground water protection, have already met many of the adequacy criteria outlined in this Guidance.

Steps EPA Has Taken and Will Continue to Take to Assist the States

EPA has already taken and will continue to take several steps indicating its commitment to the CSGWPP approach and the long-term process for eventually achieving Fully-Integrating CSGWPPs. These steps include:

- Issuing EPA's 1991 Ground Water Protection Strategy, which makes a strong Agency policy statement supporting the State-directed, resource-based CSGWPP approach;

- Investing, over the last eight years, more than $80 million under Clean Water Act §106 in building States' general ground water protection capacity and planning to continue such grants;

- Incorporating the CSGWPP approach in emerging Agency strategies, regulations, and national guidances (e.g., Pesticides and Ground Water Strategy, RCRA Subtitle D rulemaking);

- Gathering support for the CSGWPP approach in the Executive Branch of the federal government, including discussions with the White House and the Office of Management and Budget, and holding a forum with other federal agencies;

- Establishing a Ground Water Regulatory Cluster Workgroup to examine all new relevant Agency regulations to incorporate the CSGWPP approach, including increased flexibility to the States;

- Testifying before Congress, in oversight hearings, explaining the CSGWPP approach and its utility as part of emerging regulations under a variety of programs;

- Establishing a Ground Water Coordinating Committee in each EPA Region to oversee implementation of ground water policy in the Regions. These Committees will be the focus for implementing the CSGWPP approach;

- Conducting a series of Roundtables with many State and Tribal officials to discuss how the CSGWPP approach could best address State and local needs and concerns;

- Supporting a Ground Water Subcommittee to the State/EPA Operations Committee to provide on-going State input into EPA's efforts to further the CSGWPP approach;

- Developing this Guidance in close consultation with State representatives; and

- Issuing this Guidance, which furthers the concept of the CSGWPP approach and reflects a multi-program Agency effort. Of particular note, Chapter 4 and Part II of this Guidance provide an initial overview of all EPA ground water-related programs, which EPA and the States can now build upon to further define and develop the relationships between these programs and the CSGWPP approach.

1.7 OPPORTUNITIES PRESENTED BY THE NEW PARTNERSHIP AND THE CSGWPP APPROACH

As the catalyst for fundamental changes in the development and implementation of ground water protection programs at the federal, State, and local

levels, the CSGWPP approach provides unique opportunities for the successful implementation of State-directed, resource-based ground water protection programs, including:

- Addressing federally unregulated sources: Presently unregulated sources of ground water contamination may be addressed by State programs. As each State integrates its ground water protection programs through a CSGWPP, it will be able to identify gaps that may exist in ground water protection efforts (e.g., oil and gas; industrial pits, ponds and lagoons; fertilizers) and specify where additional federal/State efforts are needed.

- Funding: By endorsing Core CSGWPPs in the States and moving toward a Fully-Integrating CSGWPP, EPA and the States will be better able to demonstrate their effectiveness in protecting ground water and thereby justify additional investment in ground water program development and implementation.

- Legislation: This Guidance and the joint implementation efforts of the EPA and States will build a constituency for ground water legislation that will assist the States in setting ground water protection priorities and using federal resources to achieve them. Successful CSGWPP implementation should help ensure that State capabilities for ground water protection and needs are considered in any new ground water-related legislation.

- EPA Regulations: Development and implementation of the CSGWPP approach by the States will affect at least 50 pending EPA regulatory efforts (See Table 1-1 on page 1-8) that will impact different aspects of ground water protection or remediation efforts. EPA will establish a multi-program ground water regulatory agenda to set priorities for appropriate changes to existing regulations to allow States greater flexibility to achieve comprehensive State-directed, resource-based ground water protection.

- Other Federal efforts: Joint EPA and State implementation of the CSGWPP approach will affect other federal agencies and their pending federal regulatory and non-regulatory efforts. EPA is currently working with other federal agencies to make the CSGWPP approach the centerpiece of rational, consistent, and meaningful coordination across all federal ground water protection activities. EPA will encourage other federal agencies to enter into the planned Multi-Year Program Agreements that EPA will be undertaking with States that have Core CSGWPPs. (See Part II Section 2 for descriptions of how USDA, DoD, DOE, DOI, DOT, and NRC could coordinate programs with CSGWPPs.)

- EPA Regional operations: EPA's Regions will be reviewing all their programs in Fiscal 1993 to assess where opportunities exist for operational flexibility across all EPA ground water protection and remediation programs.

- Technical Support: EPA is developing numerous documents to assist the States with ground water protection efforts, including a Resource Assessment Technical Assistance Document to assist States in setting priorities and an Inter-Federal Agency Directory of Technical Specialties to assist States in identifying and using federal technical assistance for ground water protection programs. The Agency is also developing a technical guidance on how to delineate areas with ground water and surface water interfaces important to aquatic ecosystems. EPA will also assist States in the development and submission of their ground water protection profiles and Core CSGWPP determinations.

EPA's commitment to pursuing these opportunities will lead to significant and fundamental change in EPA operations relating to ground water protection. EPA is committed to the CSGWPP approach and to working with the States in the long-term process for achieving Fully-Integrating CSGWPPs.

1.8 WHAT THIS GUIDANCE CONTAINS

This Guidance is divided into the following chapters and appendices:

- This Chapter, the Introduction, provides a short description of the CSGWPP approach.

- Chapter 2, Strategic Activities, describes the six activities that constitute the CSGWPP approach. In addition, this Chapter outlines the other activities that States and Tribes should consider in the development of their Comprehensive Programs.

- Chapter 3, Development and Review Process, describes the process that EPA and the States are to follow to develop each State's CSGWPP.

- Chapter 4, Linkage with Other Federal Programs, describes the linkages between the CSGWPP and the various EPA and other federal programs related to ground water.

- Appendix A describes various ground water protection goals and clarifies EPA's policy on this issue.

- Appendix B describes the Agency's policy on the definition of reasonably expected uses of ground water.

- Appendix C describes the process followed in the development of this Guidance.

- Appendix D provides a glossary of acronyms used in the Guidance.

- Part II of this document supplements Chapter 4. It provides a detailed description of each of the major EPA programs affecting ground water and the ways in which that program might interact with the CSGWPP approach. It also provides a description of the programs implemented by six other federal agencies -- Agriculture, Defense, Energy, Interior, Transportation, and the Nuclear Regulatory Commission -- and the ways in which those programs could interact with the CSGWPP approach.