

TOWARD DEVELOPMENT OF A GROUNDWATER QUALITY PROTECTION STRATEGY FOR ARIZONA

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Introduction

The United States Environmental Protection Agency (EPA) has indentified as a critical element in its recently published draft National Groundwater Protection Strategy (EPA, 1980) the development of State Groundwater Protection Strategies by the individual states. Such a planning document needs to be developed by Arizona to ensure continuity between the large number of agencies that are involved in managing and protecting the state's groundwater resource. However, implementation of the strategy in Arizona is expected to encounter institutional barriers within the state. The purpose of this paper is to discuss the goals and elements in the proposed EPA and State strategies, the institutional obstacles in implementing the strategy in Arizona, and some possible solutions for overcoming these obstacles.

Over the last few years, there has been a significant change in the composition of federal funding to the state's water pollution control programs, a change that is important in Arizona since without federal support of water quality programs there would be a minimal effort in this regard. Traditionally, the EPA has assigned the highest priority for its water quality funding to construction grants to communities for centralized sewage treatment projects and to states for the development and monitoring of surface water standards and for permit programs. However, since the late 1970's these programs have been somewhat reduced in scope and replaced by programs aimed at protecting the nation's groundwater resources.

Concurrently, there has been a similar awareness by State agencies within Arizona toward the need to conserve the state's groundwater resources, both from a quality and quantity standpoint. High priority is currently being given by the Arizona Department of Health Services the State's designated water quality management agency, to assuming management of newly-established groundwater protection programs from the EPA so as to ensure that the state's groundwater protection needs are met. To complement this effort from the quantity perspective, Arizona has recently adopted a comprehensive groundwater management code designed to bring the overdrafted basins of the state back into hydro-logic balance within the next 40 years (see Arizona Revised Statutes, Section 45-101 to 45-2909).

A Proposed National Groundwater Protection Strategy

The EPA released its draft National Groundwater Protection Strategy in November 1980. This Strategy spells out the national goals of the groundwater protection programs, the approaches that should be used for attaining these goals, and the respective roles to be played by the EPA and the states in the area of groundwater quality protection. The Strategy is currently being revised and is expected to be finalized by late 1981. At present, the EPA's draft Groundwater Protection Strategy should be viewed as a document that summarizes the agency's current (and not necessarily final) thinking on the means needed to protect the quality of the nation's groundwater resources. In the Strategy, EPA envisions the states taking the lead in developing and implementing their own groundwater protection programs. "Much of their (EPA's) commitment to this idea can be explained by simple economics: the states can run a program cheaper than the federal government. The average of \$40,000, while the state's person-year averages \$30,000 - \$35,000. In addition, EPA realizes it does not have the manpower or local knowledge

of the area to run the program efficiently" (Bennett and Stephenson, 1980, 3) The EPA is seen as playing a supportive technical role to the states and intervening directly only in pollution situations which have high national priority e.g., Love Canal. In developing its Strategy, the EPA attempted to make it a national consensus of federal, state, and local interests rather than a uniform federal program. To arrive at this consensus, the EPA invited numerous representatives of state and local interests to workshops in Washington to participate in drafting the strategy.

The proposed goal in the EPA's Strategy is: "It shall be the national goal to assess, protect, and enhance the quality of groundwaters to the levels necessary for current and projected future uses and for the protection of the public health and significant ecological systems" (EPA, 1980, VI-2).

The strategy's goal statement was intentionally made flexible in order to take into account groundwaters of differing value and quality and to accommodate competing uses. However, the intent was to make it stringent enough to prevent groundwater contamination before it occurs rather than focus resources on after-the-fact clean up efforts.

The four major management approaches in the EPA's Strategy for attaining this goal are: (1) state groundwater protection strategies; (2) groundwater classification; (3) minimum national requirements for select high priority problems; and (4) EPA administrative action (See Figure 1).

<u>EPA</u>	<u>ARIZONA</u>
I. DEVELOPMENT OF STATE GROUNDWATER PROTECTION STRATEGY	PRESENTLY BEING DEVELOPED; TO BE COMPLETED BY SEPTEMBER 1983
II. GROUNDWATER CLASSIFICATION	GROUNDWATER QUALITY MANAGEMENT OBJECTIVES TO BE INITIALLY DEVELOPED FOR THE UPPER SANTA CRUZ AND SALT RIVER BASINS
III. MINIMUM NATIONAL REQUIREMENTS FOR HIGH PRIORITY PROBLEMS	DEVELOPMENT OF MANAGEMENT PLANS FOR UNCONTROLLED HAZARDOUS WASTE SITES; SPILL RESPONSE PLANS
IV. EPA ADMINISTRATIVE ACTION TO INCREASE COORDINATION AT THE FEDERAL LEVEL RELATED TO GROUNDWATER QUALITY PROTECTION	COORDINATION AGREEMENT BETWEEN STATE AGENCIES AND WITHIN ADHS

FIGURE 1. THE MAJOR ELEMENTS OF THE EPA'S NATIONAL GROUNDWATER PROTECTION STRATEGY AND CORRESPONDING STATE EFFORTS.

The development of groundwater protection strategies by and for the states, the focus of this paper, is considered to be the central element of the EPA's National Groundwater Protection Strategy. The major components of a state strategy, as viewed by the EPA, are a goal statement, a groundwater classification system consistent with federal criteria (that are yet to be established), and the state's approach and procedures for achieving its groundwater protection goal.

Elements of Arizona's Groundwater Quality Protection Strategy

The Arizona Department of Health Services (ADHS), in cooperation with the Arizona Water Quality Control Council, is the agency presently responsible for the development of the State Strategy; it anticipates completion of Arizona's groundwater quality protection strategy by the end of 1983. In October 1980, the Water Quality Control Council adopted the following groundwater protection goal for Arizona: "It shall be the state's goal to assess, and protect and manage the quality of groundwaters to the levels necessary for current and projected future uses, and for the protection of the public health (Arizona Water Quality Control Council, 1980). At present, this goal provides the basic foundation for developing the State's Strategy.

Another obvious objective that needs to be incorporated into the State Strategy is to ensure consistency between the groundwater quality protection strategy being developed by ADHS and the groundwater quantity protection strategy that the Arizona Department of Water Resources (DWR) is charged to develop by the 1980 revisions to the State's Groundwater Code (Arizona Revised Statutes, Section 45-101 to 45-2909). Focal points for consistency between these two strategies will be in Tucson and Phoenix

metropolitan areas where ADHS, in cooperation with respective designated areawide water quality management planning agencies (i.e., the councils of governments), will be developing groundwater quality management objectives while DWR will be developing "active management area" plans at the same time.

The second major element of the EPA's groundwater protection strategy is the development by the states of a groundwater classification system. The objective of the strategies typology is to delineate groundwater into different classes based upon present and projected uses and the ambient quality of the groundwater.

In Arizona, groundwater quality management objectives will initially be developed for the Upper Santa Cruz and Salt River Basins. The process for the specification of management objectives will take place over the next two years by ADHS in consultation with DWR and local councils of governments (i.e., Maricopa Association of Governments, Pima Association of Governments, and SouthEastern Arizona Governments Organization). These objectives will be developed in two phases. Phase One will involve the development of a framework methodology which will define the step-by-step process and available options for designing the objectives. The Arizona Department of Health Services, in consultation with DWR and the areawide planning agencies, is currently developing the framework methodology and anticipates adoption of it by the Water Quality Control Council in October 1981. Phase Two will be the development and local specification of the objectives. The advantages and disadvantages of each option outlined in the framework methodology will be presented to the Water Quality Control Council for their consideration and selection. The end product will be a set of proposed groundwater quality management objectives, i.e., a form of groundwater quality "standards", for the Upper Santa Cruz and Salt River Basins for Water Quality Control Council adoption.

What form will these groundwater quality management objectives (i.e., standards) take? "This question first needs to be addressed before a groundwater protection program in Arizona can proceed. Standards should not be viewed narrowly as only numerical limits but in a broad sense as constraints necessary to impose to attain identified management objectives. Maximizing the effectiveness of Arizona future groundwater pollution control program is dependent on using as broad a definition of standards as possible in order to enhance the number of options" (Bennett, 1980, 1).

The third element of the EPA's groundwater protection strategy is the adoption of minimum national requirements for high priority problems. The EPA has reserved the right to issue minimum requirements in pollution situations that are so severe or complex in nature that they require national action (e.g., a Love Canal type situation or a massive hazardous waste spill). The state is currently working with EPA in writing management plans for dealing with uncontrolled hazardous waste sites. The objective is to be prepared for any contingency that might develop if abandoned sites with hazardous waste are discovered.

The fourth element of the EPA's Strategy is administrative action to increase coordination between sections within its own agency which administer different environmental programs relating to groundwater and to increase coordination and with other Federal agencies "such as the Nuclear Regulatory Commission, the U.S. Geological Survey, the Water Resources Council, the Council on Environmental Quality and the Departments of Agriculture, Interior, Transportation and Housing and Urban Development toward achieving the goals of the strategy" (EPA, 1980, III-12). In addition, the EPA will provide the states with research data needed in groundwater protection programs.

For its part, the State needs to look at ways of increasing coordination between various State agencies that manage or protect groundwater (e.g., DWR, ADHS, and the state Land Department) and to increase coordination within ADHS of its programs that relate to groundwater (e.g., the Bureau of Waste Control's solid and hazardous waste programs and the Bureau of Water Quality Control's NPDES and Safe Drinking Water programs).

It is the opinion of the authors that new institutional mechanisms should be investigated as a means to increase coordination among state agencies. One possibility would be to make all state water quality-related agencies, not just ADHS, staff and subordinate to the Water Quality Control Council in order to make it a true statewide Council. Although, several state agencies have representatives on the Council, only ADHS provides staff to the Council and is responsible for implementing Council decisions.

The above is a summary of the four major elements in the EPA's groundwater protection strategy and some of the corresponding elements that are to be included in Arizona's groundwater protection strategy. As currently, foreseen, other elements that will be incorporated into the State Strategy include groundwater quality data management, groundwater quality monitoring, and management strategies for regulating sources of groundwater pollution from facilities (See Figure 2).

The Arizona Department of Health Services recently received a two-year federal grant from the EPA for completing the respective elements which will be incorporated into the State Groundwater Protection Strategy. The first two elements of the strategy, the goal statement and groundwater quality management objective, have already been discussed. The third major element of the State strategy is groundwater quality data management. Currently, groundwater data (both quality and quantity) is collected, compiled, and held by a number of agencies (both state and federal) throughout Arizona and is coordinated only indirectly through two major federal data systems: the EPA's STORET and the United States Geological

- I. GOAL STATEMENT*
- II. GROUNDWATER QUALITY MANAGEMENT OBJECTIVES
- III. GROUNDWATER QUALITY DATA MANAGEMENT
- IV. GROUNDWATER QUALITY MONITORING STRATEGY
- V. MANAGEMENT STRATEGIES FOR REGULATED SOURCES OF GROUNDWATER POLLUTION
- VI. MANAGEMENT STRATEGIES FOR UNREGULATED SOURCES OF GROUNDWATER POLLUTION

* ADOPTED BY THE ARIZONA QUALITY CONTROL COUNCIL, OCTOBER 8, 1980.

FIGURE 2. THE MAJOR ELEMENTS OF THE STATE'S GROUNDWATER PROTECTION STRATEGY.

Survey's WATSTORE. If the state's groundwater protection program is really to become effective, data coordination between agencies needs to increase. It is the intention of ADHS to work with the areawide planning agencies, DWR, and other interested agencies to investigate ways of increasing data coordination within Arizona. To this end, ADHS established and staffs the Statewide Water Quality Data Coordination Task Force.

A related issue forms the fourth element of the State Strategy: groundwater quality monitoring. Numerous agencies in the state conduct groundwater quality and quantity monitoring without consulting each other, a practice which often leads to duplication and waste of resources directed to monitoring. Resources could be conserved (or coverage expanded) and access to data enhanced if these agencies could share both proposed groundwater monitoring activities and the results of such monitoring. The Arizona Department of Health Services is planning to work with DWR and other interested agencies in the state to assess existing groundwater monitoring activities in Arizona and delineate steps necessary to increase coordination among agencies so as to share monitoring activities and data.

The fifth major element is a set of management strategies for addressing groundwater pollution from facilities currently regulated by ADHS. Many facilities regulated by ADHS (e.g., sewage treatment plants, septic tanks, surface impoundments) do not include an explicit groundwater protection component. An inventory and assessment of these facilities will be made and recommended changes to existing ADHS regulations and Engineering Bulletins proposed to more adequately protect groundwater quality. These recommended changes may include incorporating requirements, performance criteria, or best management practices related to discharges from facilities so that groundwater quality management objectives will be met. Also included in this element will be recommendations for how ADHS will or can enforce these regulatory changes and how coordination can take place with other agencies in these facilities (e.g., DWR's interest in injection wells and ADHS's interest in well construction regulations).

The sixth and final element is a set of management strategies for addressing groundwater pollution from facilities not actively regulated by ADHS. Certain types of facilities that potentially pollute groundwater are within ADHS statutory jurisdiction to regulate but are currently not actively regulated (e.g., mining surface impoundments and tailing ponds). Once a legal determination by the Attorney General's office on ADHS's jurisdictional authority is made regarding these facilities, a set of management strategies that outline mechanisms needed to be incorporated into operational programs for protecting groundwater will be prepared.

Conclusion

The federal support from the EPA for groundwater quality protection program development is anticipated to cease with the completion of the six elements outlined above and their articulation into the State Strategy. At that time (in 1983), it will be necessary for the Strategy and accompanying regulatory program to generate a strong commitment from the State governmental to support the implementation phase of Arizona's Groundwater Quality Protection Strategy.

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