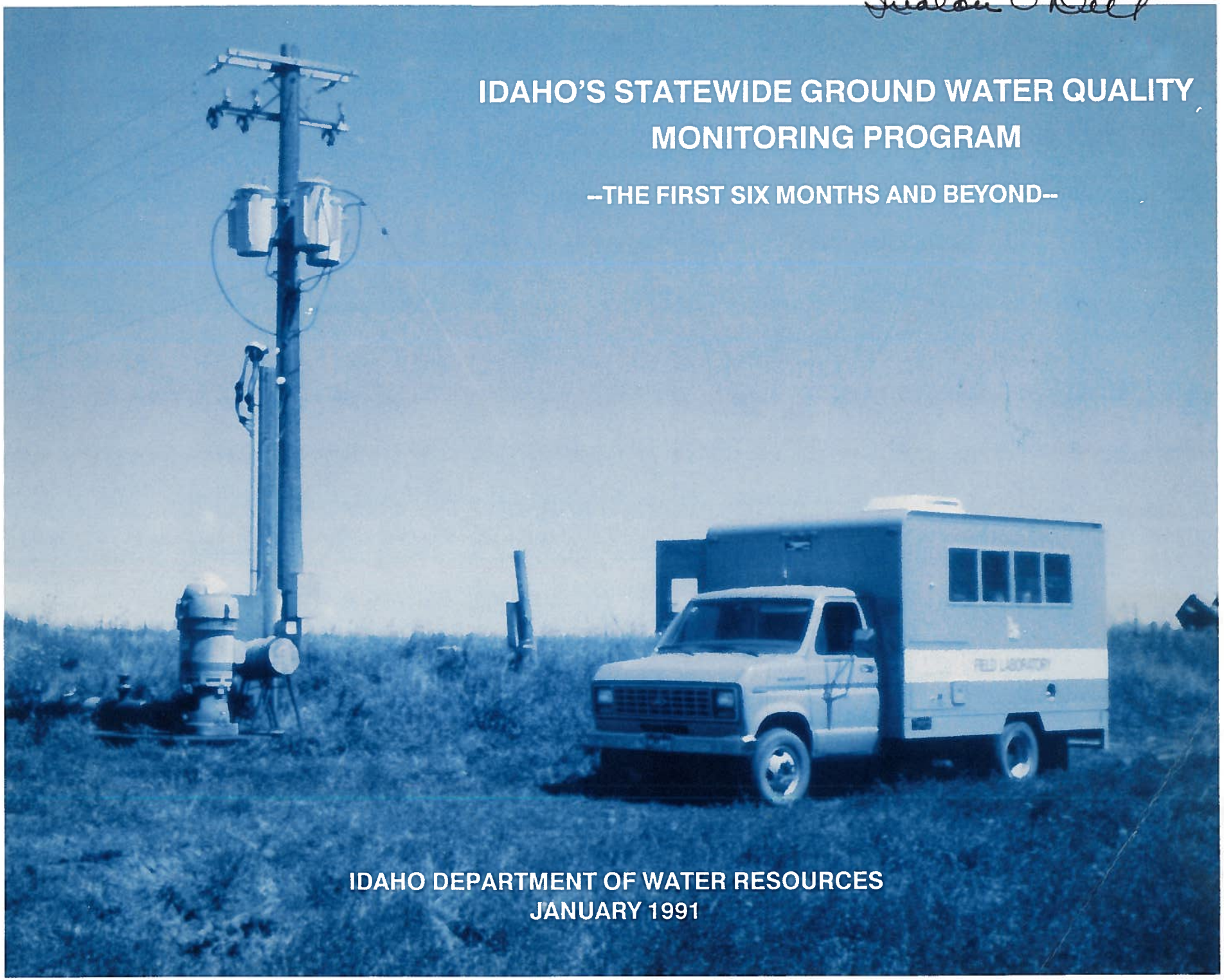
Susan O'Neal

IDAHO'S STATEWIDE GROUND WATER QUALITY MONITORING PROGRAM

--THE FIRST SIX MONTHS AND BEYOND--



IDAHO DEPARTMENT OF WATER RESOURCES

JANUARY 1991

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PREFACE

This document describes the preliminary results and work accomplished during the first six months of Idaho's statewide ground water quality monitoring program. It describes the program's objectives, the initial planning and design, the implementation strategy, and proposed future activities. It is designed as an informational document.

ACKNOWLEDGEMENTS

Idaho's statewide ground water quality monitoring program became a reality in 1990 because of the dedicated efforts of many individuals and agencies. The Idaho Department of Water Resources wishes to acknowledge and give special thanks to:

The Ground Water Quality Council

The April, 1990 Technical Workshop Attendees

U.S. Geological Survey

Idaho Department of Health and Welfare, Division of Environmental Quality

Participating Idaho Well Owners

Thank you for making this year's efforts successful.

CHAPTER 1 EXECUTIVE SUMMARY

This document describes the planning, implementation, and results of the 1990 statewide ground water quality monitoring program and proposed future monitoring activities.

Ground water samples were collected at 97 sites during August, 1990, as part of the statewide ground water quality monitoring program. Preliminary results indicate that at about 20% of these sites the ground water contained either elevated nitrate levels, or detectable pesticides or volatile organic compounds (tetrachloroethylene). However, these contaminants exceeded the drinking water standards at only about 5% of the sites.

Recognizing the need to protect and manage Idaho's valuable ground water resources, the State Legislature passed the Ground Water Quality Protection Act of 1989. The act created the Ground Water Quality Council to oversee the development of a Ground Water Quality Protection Plan. The act also called for the "development and administration of a comprehensive ground water quality monitoring network...". During the first six months of Fiscal Year 1991, the initial phase of the statewide ground water quality monitoring program was implemented.

The Idaho Department of Water Resources (IDWR) is tasked with administering the statewide ground water quality monitoring program. IDWR sponsored a technical workshop in April, 1990, to evaluate the program's objectives and develop an implementation strategy. Based on the workshop recommendations, IDWR in cooperation with the Monitoring subcommittee of the Ground Water Quality Council, developed the Statewide Ground Water Quality Monitoring Plan for Fiscal Year 1991. The plan was reviewed and endorsed by the Ground Water Quality Council.

The monitoring program's objectives are to: 1) characterize the ground water quality in the state's major aquifers, 2) identify trends and changes in ground water quality within individual aquifers, and 3) identify aquifers and/or geographic areas where water quality problems may exist.

Ground water samples were collected from 97 sites (wells and springs) by U.S. Geological Survey and Idaho Department of Water Resources personnel. **Each sample was analyzed for over 70 different constituents including common ions, trace elements, radionuclides, pesticides, bacteria, and volatile organic compounds.** Common ions and trace elements were analyzed by the U.S. Geological Survey laboratory in Arvada, Colorado; radionuclides, bacteria, and volatile organic com-

pounds were analyzed by the Idaho State laboratory in Boise; and pesticide scans were conducted by U.S. Geological Survey personnel in Boise.

Most laboratory analyses are complete and the results are being processed into easy-to-understand maps and graphic displays. This year's data is being used to identify potential water quality problem areas and to begin determining water quality of the state's major aquifers.

The data from this and other water quality programs will be inspected by a Data Review committee and stored in a computer information system that is accessible to the public. Potential system users include state and federal agencies, consultants, industry, environmental and political organizations, as well as the general public. The system, administered by the Idaho Department of Water Resources, will include well-documented instructions and help screens to assist users in retrieving the information they desire. The system is to be operational by Spring, 1991.

This year's efforts were characterized by a great deal of action and much gained experience in the logistics and actual costs of operating a statewide monitoring program. The Ground Water Quality Council and technical experts participating in the April 1990 workshop have concluded that additional monitoring sites are necessary to meet the Ground Water Quality Protection Act's objectives. The workshop experts recommended a minimum number of 375 sites for an initial statewide program. The Ground Water Quality Council agreed with this recommendation in October, 1990. This level of effort would provide the information required for monitoring Idaho's ground water quality and for providing an early warning system for pollution problems and trends.

THE NEED FOR A STATEWIDE GROUND WATER QUALITY MONITORING PROGRAM

Until this year, there was no statewide ground water quality monitoring program in Idaho. Historically, ground water quality monitoring has been limited to Health and Welfare's public drinking water program, compliance monitoring at Superfund cleanup areas, and localized studies conducted by federal, state, and private agencies. The data from these studies are useful and will be integrated into the statewide information system; however, they do not provide the comprehensive information needed to determine the overall health of Idaho's aquifers, nor do they provide the data to determine trends in our water quality.

ENABLING LEGISLATION

Recognizing the need to protect and manage Idaho's valuable ground water resource, the State Legislature passed the Ground Water Quality Protection Act of 1989. The act created the Ground Water Quality Council to oversee the development of a Ground Water Quality Protection Plan and charged three State agencies: Agriculture, Health and Welfare, and Water Resources with the responsibility to assist the Council in developing the plan.

The Act also called for the "development and administration of a comprehensive ground water quality monitoring network...". The Idaho Department of Water Resources is tasked with administering the monitoring network. This document describes the planning, implementa-

Ground Water Quality Council is developing the State's Ground Water Quality Protection Plan.

tion, and results of the 1990 statewide ground water quality monitoring program and proposed future monitoring activities.

GROUND WATER QUALITY COUNCIL

The 22-member Ground Water Quality Council was established in 1989 according to the guidelines in the Ground Water Quality Protection Act of 1989. The Council includes 17 voting and 5 non-voting members. Council members represent diverse water quality groups and interests such as agriculture, mining, petroleum, soil conservation, environmental, manufacturing, food processing, general public, board of health, and public agencies (federal, state, and local). All council members, except the directors of the three state agencies and the board of health representative, were appointed by Governor Andrus.

PRIMARY PLANNING

The Ground Water Quality Council began meeting bi-monthly in January, 1990. Since then, the Council has formed the Executive Committee and the Planning, Agricultural-Chemical, and Monitoring subcommittees to address specific water quality issues.

The Monitoring subcommittee is comprised of 4 Council and 6 non-Council members. The subcommittee's first assignment was to develop a prototype statewide ground water quality monitoring plan and to begin initial monitoring efforts in 1990. After some discussion, the Monitoring subcommittee realized that many technical questions concerning the network remained unanswered. As a result, a technical workshop was organized to plan the 1990 monitoring effort.

TECHNICAL WORKSHOP

The Idaho Department of Water Resources (IDWR) held a two-day technical workshop in cooperation with the Idaho Departments of Health and Welfare (IDHW), and Agriculture (IDA), and the U.S. Geological Survey (USGS) in April, 1990. The meeting was attended by a wide variety of ground water quality experts (Table 1). The workshop attendees provided recommendations in three major areas: 1) Monitoring Network Design, 2) Data Requirements and Analytical Procedures, and 3) Information System Design. Despite the variety of viewpoints of many of the attendees, agreements on major decisions were quickly reached with a high degree of cooperation.

THE FISCAL YEAR (FY) 1991 MONITORING PLAN

The Monitoring subcommittee and IDWR used the workshop recommendations to develop the Statewide Ground Water Quality Monitoring Plan for FY 1991. The plan describes the objectives, network design, analytical procedures, and benefits for the program's first year. The plan was reviewed and approved by the Ground Water Quality Council in July, 1990.

STATEWIDE MONITORING PROGRAM OBJECTIVES

Clearly-stated and closely-followed objectives are critical to a monitoring program's success. The objectives of the statewide ground water quality monitoring program are to:

1. Characterize the ground water quality in the state's major aquifers,
2. Identify trends and changes in ground water quality within individual aquifers, and
3. Identify aquifers and/or geographic areas where water quality problems may exist.

NAME	AFFILIATION	NAME	AFFILIATION
Hal N. Anderson	Idaho Dept. of Water Resources	John McLeod	Idaho Dept. of Water Resources
John Ansted	Morrison Knudsen	Brad L. McKinley	Prodata, Inc.
Joe Baldwin	Idaho Dept. of Health & Welfare	Kirk Miller	Chen-Northern, Inc.
Jack Barraclough	EG&G Idaho	Mike Pallesen	Mervine & Pallesen, Inc.
Warren Barrash	INEL Oversight Project	Deb Parliman	U.S. Geological Survey
Chuck E. Brockway	University of Idaho	Dale Ralston	University of Idaho
Lin Campbell	Idaho Dept. of Water Resources	Rick Raymond	Morrison Knudsen
Paul Castelin	Idaho Dept. of Water Resources	Dick Rodgers	Idaho Dept. of Health & Welfare
Gordon Deems	Idaho Dept. of Health & Welfare	Michael Rupert	Idaho Dept. of Health & Welfare
Jim Dodds	Idaho Bureau of Laboratories	Tim Spruill	U.S. Geological Survey
Chuck Feast	CH2M-Hill	Ann Smedley	Idaho Dept. of Water Resources
Randall Fields	U.S. Geological Survey	Mike Somerville	Soil Conservation Service
Gerald Flerchinger	USDA-ARS	Randal W. Steger	Idaho Dept. of Health & Welfare
Cheryl Grantham	Idaho Dept. of Health & Welfare	Jim Yost	Idaho Farm Bureau
Wayne T. Haas	Idaho Dept. of Water Resources	Tom Welsh	Idaho Dept. of Agriculture
Paul Jehn	Idaho Dept. of Health & Welfare	Luke White	EG&G Idaho
Ron Lane	Idaho Dept. of Health & Welfare	Gerry Winter	Idaho Dept. of Health & Welfare
Rick Mallory	Idaho Dept. of Health & Welfare	Walley Wipper	Bureau of Reclamation
Larry J. Mann	U.S. Geological Survey	Dave Zimmer	Bureau of Reclamation

Table 1. Ground Water Quality Workshop Attendees--April 23-24, 1990

IMPLEMENTATION

Once an approved plan was in place, IDWR, in cooperation with IDHW, IDA, and the U.S. Geological Survey, began the process of selecting suitable monitoring sites. Selecting the analytical laboratories, working with the USGS to develop field teams to do the actual sampling, developing appropriate field and laboratory quality assurance procedures, and developing procedures to be followed if contaminants were discovered were the major work items accomplished during the implementation phase.

DETERMINATION OF PARAMETERS FOR ANALYSIS

The chemical constituents analyzed at each sampling site this year are listed in Table 2. The constituent list was developed by the technical experts attending the April, 1990, workshop and represents an acceptable, but not preferred, number and type of constituents. A preferred level would emphasize more organic and pesticide analyses, but would also be several times more expensive than the acceptable level. It was decided that justification for moving to the preferred level would be developed after reviewing the first few years' results.

SELECTION OF SAMPLING SITES

Idaho has five major aquifer types: unconsolidated alluvium and glacial outwash, sedimentary rock, Snake River basalt, Columbia River basalt, and Banbury basalt (Figure 1). Considerable hydrogeologic diversity exists within each aquifer type. Because of this diversity and the state's geographic variability, at least 70 different hydrologic flow systems have been identified.

One hundred and four sites (existing wells and springs) were selected for

CONSTITUENT	USGS LAB COST	STATE LAB COST
Common Ions (calcium, chloride, fluoride, magnesium, nitrate, phosphorus, potassium, silica, sodium, sulfate)	$ 72.31	$ 84.50
Trace Elements (arsenic, cadmium, chromium, copper, cyanide, iron, lead, manganese, mercury, selenium, zinc)	$169.81	$205.50
Field Properties (alkalinity, pH, specific conductance)	$ 5.84	$ 10.00
Microbiological (fecal coliform)	0.00	$ 10.00
Radionuclides (gross alpha and beta)	$ 60.00	$ 25.00
Volatile Organic Compounds (8 regulated and 35 unregulated)	$114.00	$100.00
Pesticides (immunoassay scan for triazine, chlorophenoxy, and carbamate pesticides)	$ 60.00	NA
USGS analyzed common ions, trace elements, field properties, and pesticides; State lab analyzed microbiological, radionuclides, and volatile organic compounds. TOTAL COMBINED ANALYSES COSTS = $443 PER SAMPLE		

Table 2. Ground Water Constituents Analyzed At Each Site During FY 1991 Monitoring Program

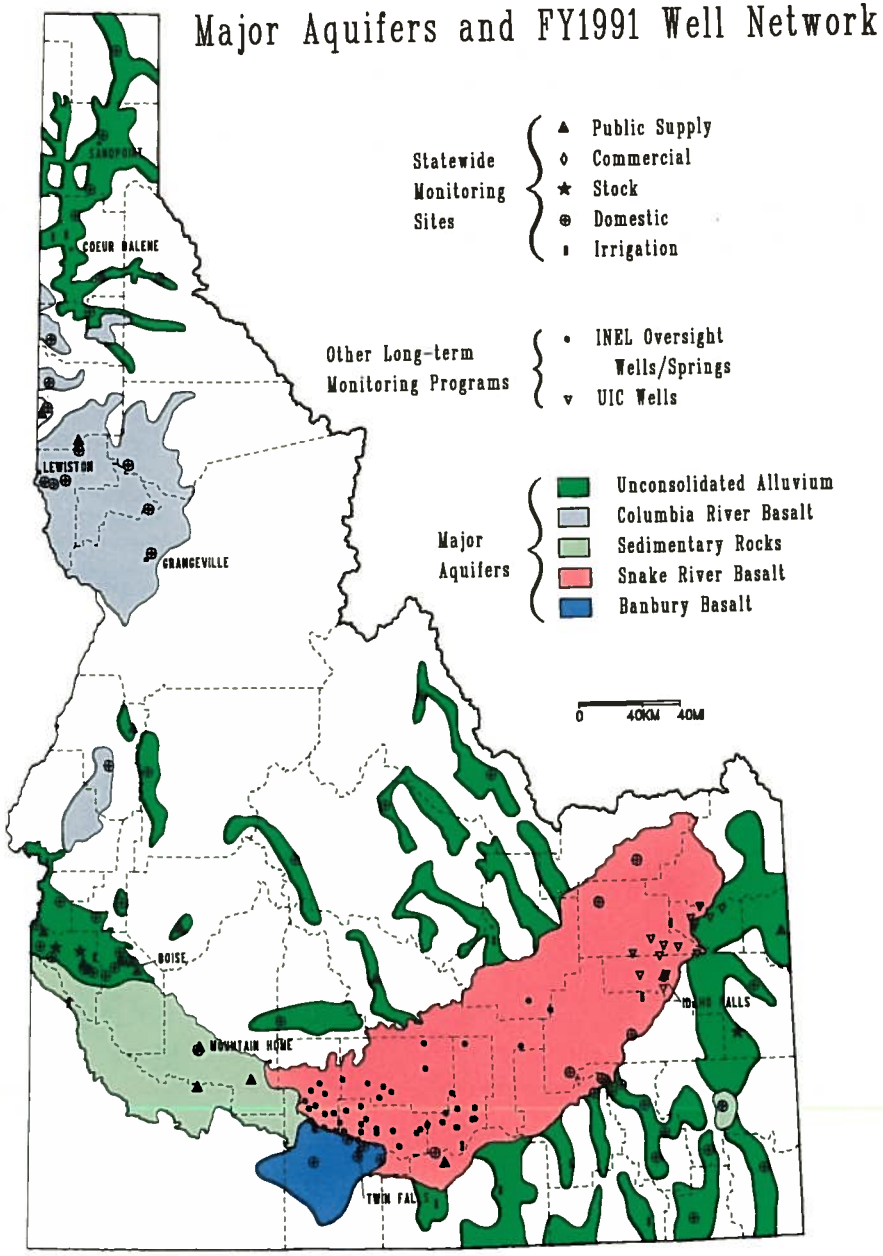


Figure 1. Major Aquifers and Monitoring Well Network, 1990

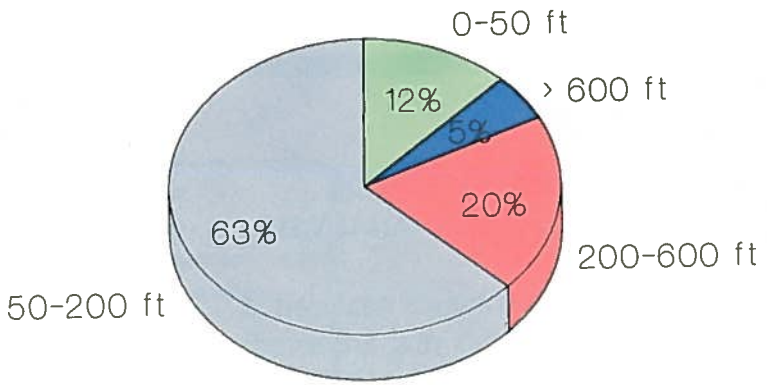


Figure 2. Well Depth Ranges for FY 1991 Monitoring Sites

sampling in the major aquifers (Figure 1). Within individual flow systems, sites were selected based on hydrogeologic and well construction data. The majority of the wells selected were less than 200 feet deep (Figure 2) because shallow aquifers generally are more vulnerable to contamination. Sites were selected by personnel from the Idaho Departments of Water Resources, Health and Welfare, and Agriculture, and the U.S. Geological Survey.

COORDINATION WITH STATE AND FEDERAL PROGRAMS

The statewide ground water quality monitoring program is specifically designed so as not to duplicate other water quality monitoring efforts. An example of this is the coordination between the statewide program with the Idaho National Engineering Laboratory (INEL) Oversight and the Underground Injection Control (UIC) ground water quality monitoring programs for the eastern Snake River Plain aquifer. Figure 1 shows that this year's monitoring sites were not selected in areas where current INEL and UIC monitoring was being done. The data from both the UIC and INEL programs are to be included in the statewide database.

FIELD SAMPLING AND QUALITY ASSURANCE (QA) PROCEDURES

Ground water samples were collected from 97 of the 104 selected sites by U.S. Geological Survey and Idaho Department of Water Resources personnel. Sampling took about 760 man-hours and was completed by six 2-man field teams in August. The field teams were supported by the superb efforts of the USGS district office staff in Boise, who organized the supplies and equipment and shipped the samples to the analyzing laboratories.

Water samples were collected, preserved, and handled according to established guidelines and protocols. Field instruments were regularly calibrated according to the manufacturer's instructions. Six samples were specifically collected for quality assurance checks and used to test the laboratories' precision levels.

LABORATORY ANALYSES

The Idaho State laboratory in Boise, Idaho, and the U.S. Geological Survey laboratory in Arvada, Colorado, analyzed this year's ground water samples. The laboratories were evaluated and selected based on technical expertise and cost considerations. The USGS laboratory analyzed the inorganic and common ion constituents, and the Idaho State laboratory analyzed the radionuclides, microbiological constituents, and volatile organic com-

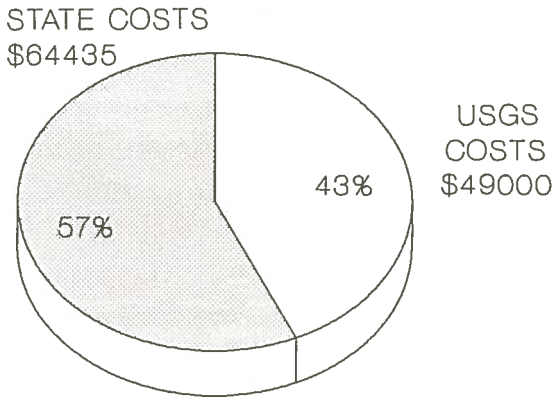


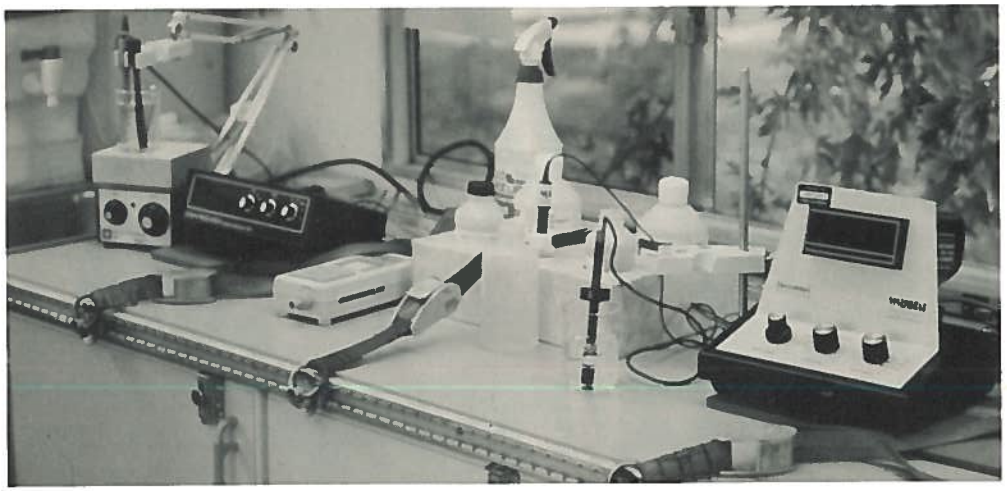
Figure 3. 1990 Sampling and Analysis Costs

pounds (Table 2). The immunoassay pesticide scans were conducted by USGS personnel in Boise.

SAMPLING AND ANALYSIS EXPENSES

The total cost for collecting and analyzing this year's 97 ground water samples was $113,435. The program costs were shared by the state and the USGS (Figure 3). About $49,000 was contributed by the USGS in a joint funding agreement. Therefore, the state's costs were $64,435. The total laboratory costs were $42,971, or about $443 per sample (Table 2); the remainder was support costs for the field teams.

Each ground water sample cost about $1,169 to collect, ship, and analyze. These expenses represent what can be expected in a larger-scale effort, although bulk purchasing, batch contracts on analyses and other cost-cutting measures could reduce costs somewhat. A major objective of the program is to ensure high-quality data at reasonable cost. As a comparison, costs associated with stricter regulatory-type monitoring can exceed $2,000 per sample. The costs of remediating problems that may have been avoided by early detection run several orders of magnitude greater than the annual costs of the statewide monitoring network.



Some water quality parameters are measured and recorded in the mobile field laboratories.

FIELD SAMPLING

Preliminary results indicate that this year's sampling effort was successful. Despite a very short lead time, the field teams and support staffs were able to collect ground water samples from 97 of the 104 selected sites, or 93% of the goal. Seven sites were not sampled because of various problems (unable to contact well owners, well no longer in operation, etc.). Most laboratory analyses are now complete and are available upon request from IDWR. The data can now be used to accomplish two of the program's three objectives. First, a picture of the existing quality of the state's aquifers is beginning to be developed. Second, potential ground water quality problem areas are beginning to be identified. The third objective, trend identification, will require several more years of monitoring before seasonal and longer-term trends can be established.

Thirteen containers of water are collected at each site.

Figure 4, showing gross alpha and nitrate concentrations, and Figure 5, showing pesticide and volatile organic compound concentrations, illustrate how data can be presented to explain concentration distributions for specific constituents. These maps will be used to identify problem areas and vulnerable aquifers, and to suggest areas for additional studies. For example, the 1990 results indicate that some ground waters in Idaho have elevated nitrate levels and detectable pesticides and volatile organic compounds.

Figure 6 shows the relationship

Accessibility at some sites can be a problem.

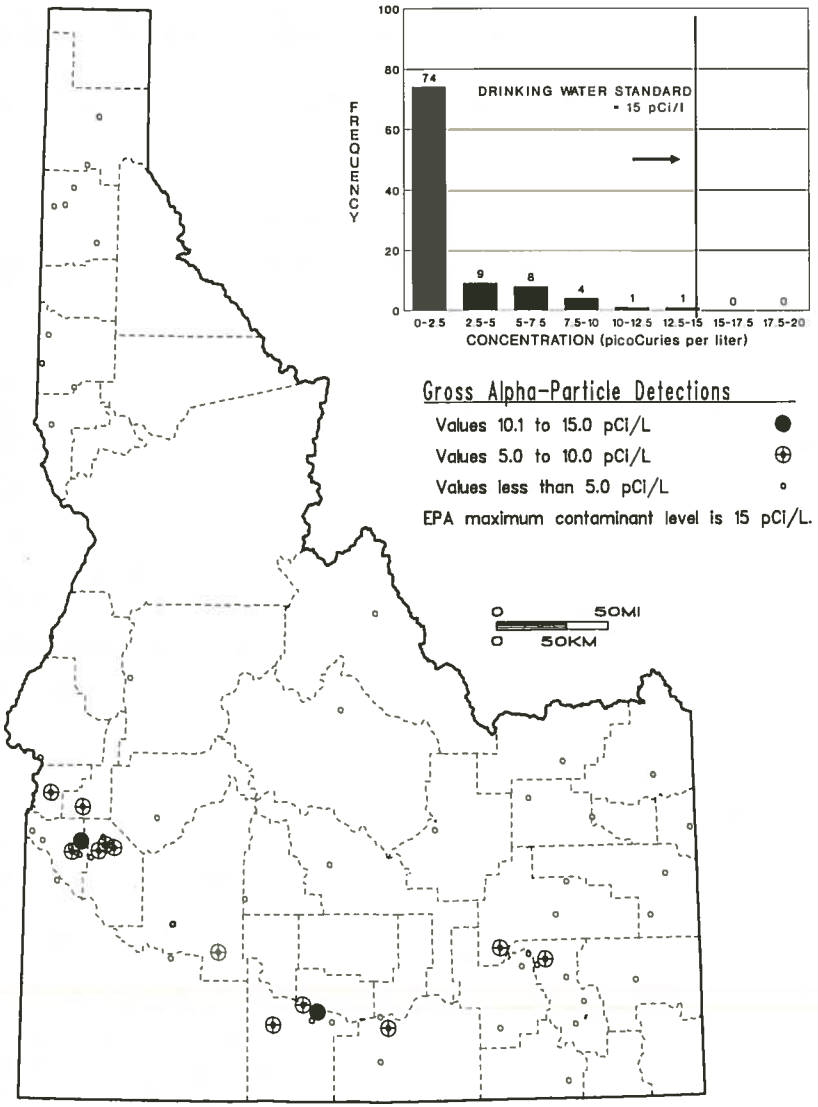
between this year's sampling results and the Snake River Plain Ground Water Vulnerability Assessment. The latter program is a first-time attempt to map areas sensitive to ground water contamination. Within the Snake River Plain, all of this year's statewide monitoring sites with elevated nitrate levels and detectable pesticides and volatile organic compounds occurred in the two highest vulnerability categories. This important relationship may be used to select future monitoring sites and study areas.

NOTIFYING THE PARTICIPATING WELL OWNERS

All participating well owners will receive copies of the analytical results for their records. The results will include a list of the constituents with detected concentrations, all currently-existing drinking water standards, and any appropriate explanations. Well owners will be given information concerning where to call if they have questions or concerns.

Participating well owners whose ground water samples indicate a potential problem are immediately contacted. The well owners are provided with the test results, any existing health advisories from the Environmental Protection Agency or Idaho Department of Health and Welfare, and the name of a Department of Health and Welfare contact. In most instances, arrangements are made to re-sample the ground water. If the results of re-sampling are once again positive, the owner is again notified of the results and his options.

Immunoassay scans detected triazine pesticides in five ground water samples.



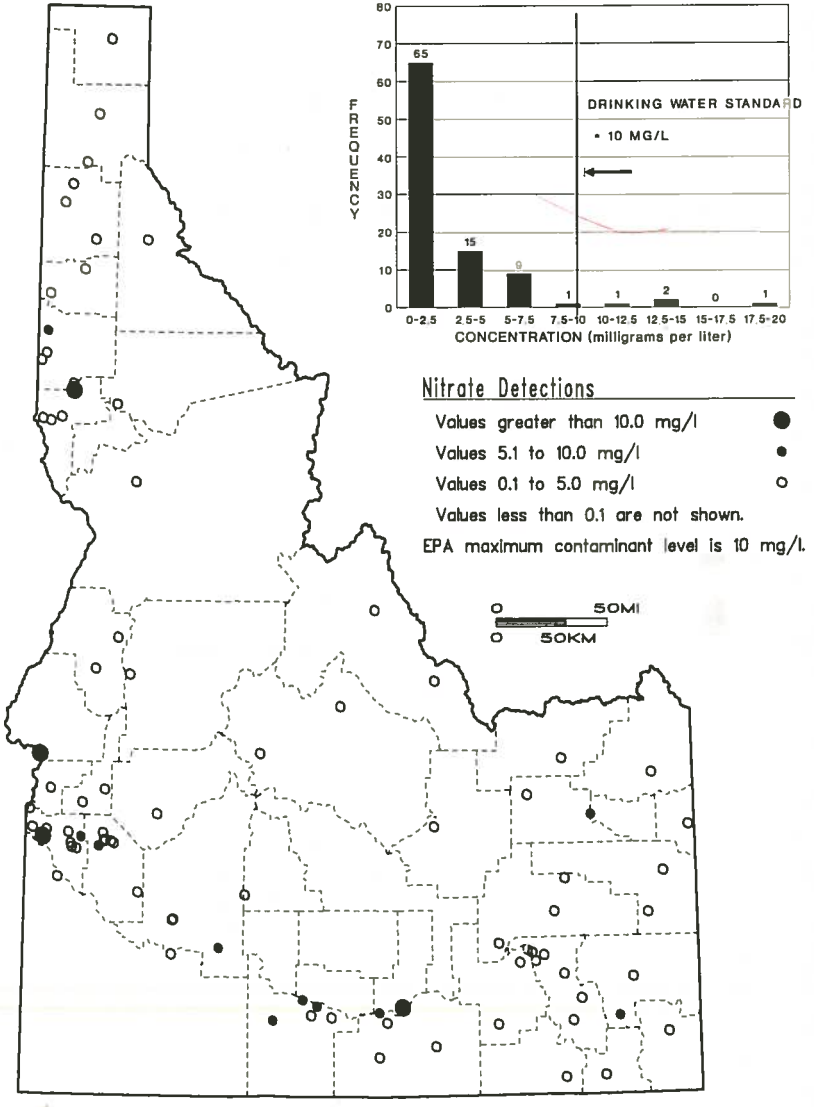


Figure 4. 1990 Statewide Gross Alpha and Nitrate Data

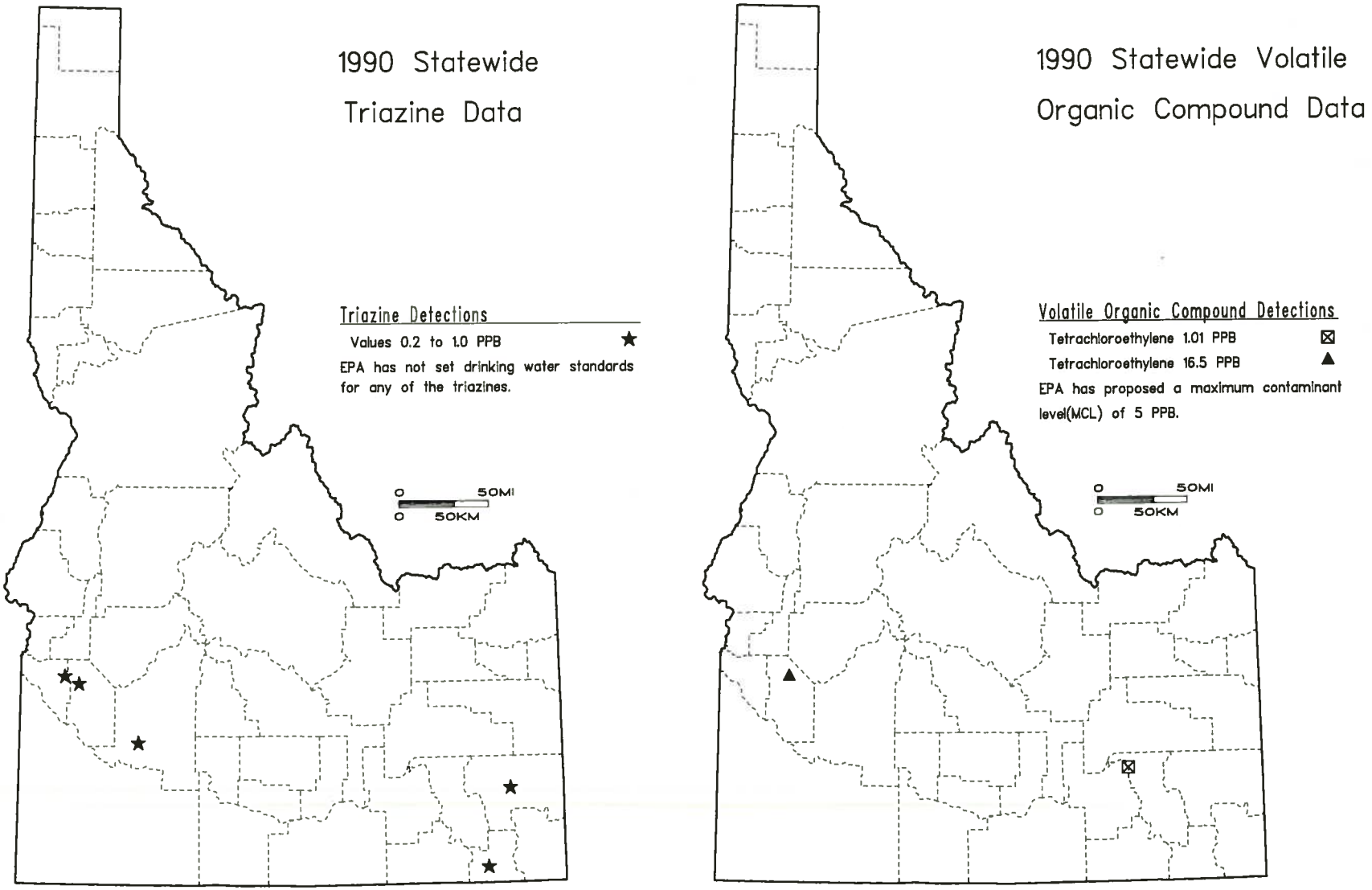


Figure 5. 1990 Statewide Triazine And Volatile Organic Compounds (VOC's) Data

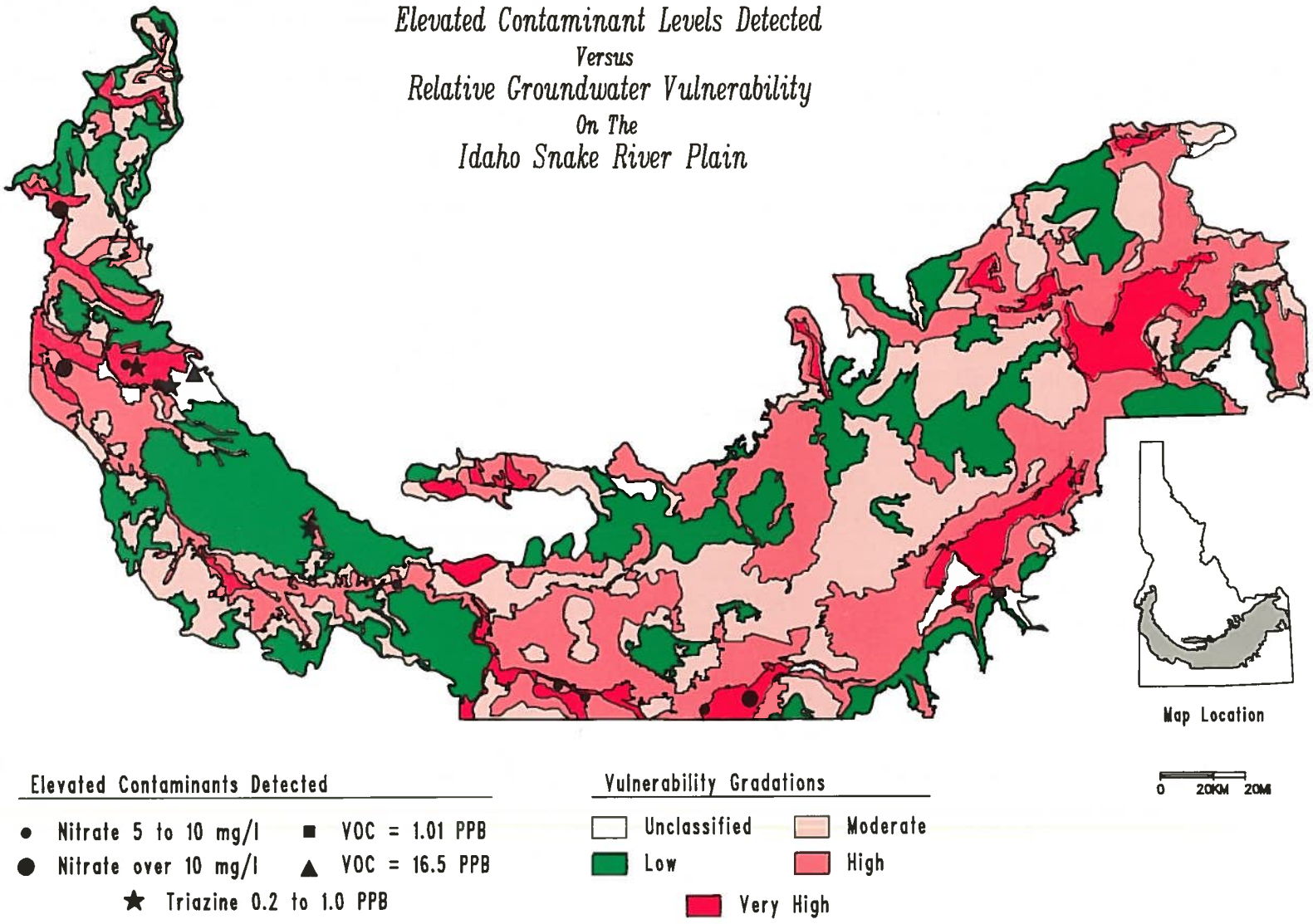


Figure 6. Aquifer Vulnerability and Contaminant Detection Relationships. Vulnerability data from cooperative ground water vulnerability assessment project between the Idaho Dept. of Health and Welfare, Idaho Dept. of Water Resources, U.S. Geological Survey, & U.S. Soil Conservation Service.

INFORMATION SYSTEM DEVELOPMENT

The Ground Water Quality Protection Act of 1989 tasks the Idaho Department of Water Resources with developing and maintaining a water quality information system. The information system consists of computers which will store both current and historic ground water quality data. Besides simply storing the data, the computerized system will be able to produce reports, customized data sets, and map products, and will be accessible to a wide variety of users. Potential system users include state and federal agencies, consultants, industry, environmental and political organizations, and the general public. The system will include simple, well-documented help screens and procedures for requesting special products such as data reports and maps. A goal for the system is to make access to data as timely and easy as possible for users across the state.

In the first six months of FY 1991, The Idaho Department of Water Resources awarded a computer consulting contract and hired two database analysts. During the second six months of FY 1991, IDWR will purchase the computer system and will implement the information system based upon recommendations from the workshop experts, the consultant and system requirement studies.

DATABASE DEVELOPMENT AND LOADING

The data in Idaho's ground water quality database must be useful and reliable. All data input into the database will be inspected by a Data Review committee and assigned a confidence level. Idaho's data ranking system currently in development will probably be equivalent to the 5-level system used by the Environmental Protection Agency, with an additional category for questionable data. Data will be ranked according to quality assurance information regarding sampling, handling, and analysis procedures. Data will begin to be entered into the database as soon as the information system is operational and the Data Review committee is established in the Spring of 1991.

PUBLIC INFORMATION AND EDUCATION

One author noted that monitoring networks are often "data-rich but information-poor". Converting data into information and providing it to users is an important program goal expressed in the 1989 Act. Public information and education so far this year has included a one-page flyer describing the program--distributed to the participants in the sampling program, press releases, television interviews, and this document.

Future informational products will include quarterly or semi-annual newsletters, maps, annual reports, 5-year summaries, and periodic public information brochures. Additional public education may include public meetings, seminars, and television spots. Public education can be further enhanced through cooperation with other water education programs like those of the Idaho Water ResourcesResearch Institute. This cooperation will help prevent duplication, increase the sharing of resources, achieve wider dissemination of information, and take fuller advantage of federal matching funds which may be available for public education.

COORDINATION WITH THE GROUND WATER QUALITY COUNCIL

The Ground Water Quality Council is currently developing the policies, classifications, and standards that will become the state's ground water quality protection plan. The Monitoring subcommittee seeks to develop and implement a monitoring plan that reflects the Ground Water Quality Protection Act's and the Council's goals. Therefore, the monitoring plan will retain some flexibility for the first couple of years until the Council has adopted and gained public approval for the protection plan.

THE FY 1992 MONITORING PROGRAM

Members of the Ground Water Quality Council and other water quality experts recognize that additional monitoring sites are necessary to meet the Act's objectives. The recommended minimum level of 375 sites was proposed by the April, 1990, workshop attendees and was supported by the Council in October, 1990.

IDWR and the monitoring subcommittee are modifying this year's monitoring network to include additional monitoring sites. The network will be statistically designed to allow for scientifically-defensible analyses of the data. The network design will include both fixed stations (for identifying trends) and randomly selected stations (for determining aquifer qualities and for better areal coverage at minimum cost).

STAFF REQUIREMENTS

The Ground Water Quality Monitoring Section of IDWR oversees the statewide ground water quality monitoring program and the IDWR responsibilities in the INEL Oversight Program. Primary responsibilities for the statewide ground water quality monitoring program include designing the monitoring network, physically doing, or arranging for, the actual ground water sampling, developing the information system, and devising the means by which users will access the information system. Currently, the section's 6-person staff includes a supervisor, 2 hydrogeologists, 2 database analysts, and a geographic information system specialist to manage the above responsibilities and the IDWR share of the INEL oversight program. Proposed future staff positions requested to help achieve the program's goals include a ground water quality analyst and a technical reports writer. The ground water quality analyst will assist in managing the sampling program, analyzing the data, and producing products for continuing public education. The public information specialist will assist in providing information to all interested parties and the public on the results of monitoring, through

special studies, annual reports, and any other publications found to be required.

FUNDING REQUIREMENTS

The current base level funding for the statewide ground water quality monitoring program is $187,300. Additional funding of $352,000 is needed to expand the program to 375 sites as recommended by Ground Water Quality Council resolution. This brings the total funding required to implement the program to about $539,300. Table 3 illustrates how the funds would be used.

CATEGORY	AMOUNT
PERSONNEL COSTS	$ 129,300
OPERATING EXPENDITURES	$ 39,200
CAPITAL OUTLAY	$ 20,800
CONTRACT SERVICES:	$ 350,000
TOTAL	$ 539,300

Table 3. Proposed Budget for FY 1992 IDWR Ground Water Quality Monitoring Program

APPENDIX A: DEFINITIONS

Alluvium-Sediments laid down by physical processes in river channels, floodplains, and fans at the foot of mountain slopes.

Aquifer-Any body of porous saturated material, such as rock, sand, gravel, etc., capable of transmitting ground water and yielding economically significant quantities of water to wells and springs.

Basalt-A fine-grained extrusive volcanic rock, commonly dark in color and composed mainly of plagioclase feldspar and pyroxene.

Cleanup-The removal, treatment, or isolation of a contaminant from ground water through the directed efforts of humans or the removal or treatment of a contaminant in ground water through management practices or the construction of barriers, trenches and other similar facilities for prevention of contamination, as well as the use of natural processes such as ground water recharge, natural decay and chemical or biological decomposition.

Common Ions-Commonly-occurring charged atom or group of atoms. Examples are calcium, magnesium, potassium, and silica.

Contaminant-Any chemical, ion, radionuclide, synthetic organic compound, microorganism, waste or other substance which does not occur naturally in ground water or which naturally occurs at a lower concentration.

Contamination-The direct or indirect introduction into ground water of any contaminant caused in whole or in part by human activities.

Drinking Water Standard-A maximum-allowable concentration level for a constituent in water that is used for drinking. Standards serve as a basis for appraising water quality. Public water supplies are subject to drinking water stan dards.

Elevated Nitrate Levels-Nitrate concentrations that exceed natural levels. In this study, nitrate levels above 5.0 milligrams per liter are considered elevated.

Gross Alpha-Radioactivity given off as alpha particles during the radioactive decay process. Gross alpha is measured in pico Curies per liter (pCi/l).

Ground Water-Any water of the state which occurs beneath the surface of the earth in a saturated geological formation of rock or soil.

Immunoassay Scan-An enzyme-based field screening technique for detecting pesticides in water and soil.

Injection Well-Any excavation or artificial opening into the ground which meets the following three criteria:

a. It is a bored, drilled or dug hole, or is a driven mine shaft or a driven well point; and
b. It is deeper than it is wide; andc. It is used for or intended to be used for injection.

Monitoring Site-A specific point or location where air, water, or soil samples are collected for analysis. In this study, monitoring sites are wells and springs.

Nitrate-Is a naturally occurring inorganic ion comprised of the chemical radical NO3. (Examples--fertilitzer, animal waste, etc.)

Outwash-Sediments deposited by melt-water streams beyond the end of an active glacier.

Pesticide-The term "pesticide" means (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, and (2) any substance or mixture of substances intended for use as a plant growth regulator, defoliant, or desiccant. Insecticides, herbicides, fungicides, rodenticides, fumigants, disinfectants and plant growth regulators are all identified as pesticides.

Sedimentary Rock-Rocks formed by the accumulation, compaction, and lithification of sediment.

Superfund Sites-Refers to those contaminated areas that are targeted for cleanup as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980.

Trace Elements-Elements present in minor amounts in the earth's crust. Includes elements such as arsenic, cadmium, chromium, iron, lead, mercury, and others.

Triazine-A family of herbicide compounds commonly used to control weeds in alfalfa, corn, sorghum, sugar beets, and certain fruits.

Volatile Organic Compound-Liquid or solid organic compounds with a tendency to pass into the vapor state. (Example--tetrachloroethylene)

GROUND WATER QUALITY COUNCIL

NAME	REPRESENTING
Council Members	
Joe Nagel	Department of Health & Welfare
Keith Higginson	Department of Water Resources
Rod Awe	Department of Agriculture
W. James Burns, Jr.	District Board of Health
Jack Lyman	Mining Industry
Jim Yost	Agriculture, Feedlot & Dairy Industry
Don Kramer	Soil Conservation Districts
Ned Bowler	Environmental Group
Bruce Smith	General Public
Matt Eames	Petroleum Industry
Jim Radford	Agricultural Chemical Manufacturing or Distribution
Jay Webb	City Government
Frank Krone	Food Processing Industry
Tom Korpalski	Manufacturing/Hazardous Waste
Joan Cloonan	Hazardous Water Treatment/Storage/Disposal
Nancy Johansen	County Government
Michael Ortega	Conservation Organization
Ex-Officio Members	
Dale Ralston	University of Idaho, College of Mines
Roy Mink	University of Idaho, Water Resources Research Institute
Warren McFall	Environmental Protection Agency
Jack Barraclough	Idaho National Engineering Lab
Jerry Hughes	U.S. Geological Survey

All maps in this report were generated by the Idaho Image Analysis Facility(IIAF), Idaho Department of Water Resources(IDWR). The water resource data presented in the maps is in digital form, and is archived at IDWR.

IIAF produced the maps for this report using ARC/INFO software, which is produced by the Environmental Systems Research Institute of Redlands, California.